ANWENDUNGSZENTRUM
Oberpfaffenhofen

GSA

GALILEO
Masters

2010
THE RESULTS
EUROPEAN
SATELLITE NAVIGATION
COMPETITION

>> With 357 participants from 44 countries the European Satellite Navigation Competition has reached a new all-time high this year and also the number of partner regions could be increased again. This network means excellent exchange opportunities for Bavaria in a large future market and the companies founded as a result of the competition speak for themselves. <<

Martin Zeil
Bavarian State Minister for Economic Affairs, Infrastructure, Transport and Technology

With the foundation of the fourth ESA Business Incubation Center, which the Free State of Bavaria is co-funding Bavaria has created another milestone for the promotion of technology transfer to create down to earth jobs using space technology, and to support entrepreneurs with their innovative projects.

The common aim of ESA, DLR, and Kreissparkasse München-Starnberg to incubate 10 start-up companies at the new ESA BIC Oberpfaffenhofen annually was already reached in its first year. Apart from applications for robotics, simulation software or laser communication, in the past year alone three companies could be incubated that had successfully been founded as a result from the European Satellite Navigation Competition. Furthermore, there are two other entrepreneurs who make use of GNSS applications to combine these with dynamic earth observation data.

I am very proud that the top three participants of the European Satellite Navigation Competition 2010 are innovators who had submitted their ideas for the region of Bavaria, and I am confident that this will result in further impetus for the innovative strength and growth in the region.

I would like to thank all participants for their trust in the impact of the idea competition, as well as all partner regions for their efforts and their support for the realisation of the awarded ideas.

Martin Zeil

From 3 to 5 March 2010, more than 1,000 developers, decision makers, and industry leaders attended the Galileo Application Days in Brussels, Belgium, where the European GNSS Supervisory Authority (GSA) and the Application Center for Satellite Navigation Oberpfaffenhofen (AZO) showcased demonstrations of ready-to-market GNSS applications developed in FP7 projects or with the support of the ESNC partner regions. The enormous interest in this event was reflected by the record number of participants in the European Satellite Navigation Competition 2010. From May to July, 357 contestants from 44 countries submitted their innovative business ideas on ways to use satellite navigation in a wide range of application areas.

Among others, these inventions cover classic GNSS-related fields, such as road applications and location-based services that include trend-setting ideas for augmented reality navigation, parking assistance, and the display of vehicle emissions in real time. New algorithms have been awarded for enhancing the precision of signals and securing credit card transactions. The results of the competition also serve as a vivid indication of how the public sector can profit from Global Navigation Satellite Systems (GNSS) – particularly in healthcare and risk management, but also in e-government and environmental monitoring (see the statistics on page 8).

Satellite navigation offers enormous potential in providing solutions to specific industrial issues – a fact demonstrated by the 80% of ESNC 2010 participants who also submitted their ideas for one of the competition's special topic prizes. Special thanks is due to the ESNC's title sponsor, T-Systems, which took advantage of the creative impulses of the competition for the fourth time – this year in cooperation with the European Space Agency – in searching for solutions that combine GNSS with dynamic Earth observation data. We would also like to thank both the European GNSS Supervisory Authority (GSA) for once again advancing the market for applications that leverage the unique aspects of the European Geostationary Navigation Overlay Services (EGNOS), and NAVTEQ – the world's leading provider of digital maps – for boosting application development in the field of location-based services. In addition, we owe our gratitude to the Forum SatNav MIT Baden-Württemberg for its involvement in searching for the best secure transport and safety-of-life applications. Further thanks goes to the German Aerospace Center (DLR) and the European Space Agency (ESA), who have trusted in the ESNC's innovation potential and supported the competition since its inception in 2004.

Thorsten Rudolph
Managing Director

Stefanie Herrmann
Chief Financial Officer

Ulrike Daniels
Business Development

Andreas Dippelhofer
Project Management

With 23 global partner regions – and more to come in 2011 – the European Satellite Navigation Competition boasts a proven track record of success in supporting the development of a future market and fostering international networks. Together with the competition's international network of 180 experts, regional support programmes, and the four ESA Business Incubation Centres, these regions will continue to aid exciting new companies in turning their many applications and business cases into full-fledged, successful products.

The successful start of the GAINS (Galileo Advanced INnovation Services) project also shows that the FP7-funded cooperation with the 220 nodes of the European Network of Living Labs – a user-driven innovation platform in real-life environments – is heading in the right direction. The opportunity the three winners of the first GNSS Living Lab Prize will have to conduct feasibility testing in a suitable Living Lab represents yet another step towards seamless integration of downstream GNSS application services.

We would like to thank all our partners for their outstanding support and already look forward to an exciting European Satellite Navigation Competition 2011, which will run from 1 April to 30 June for the first time.
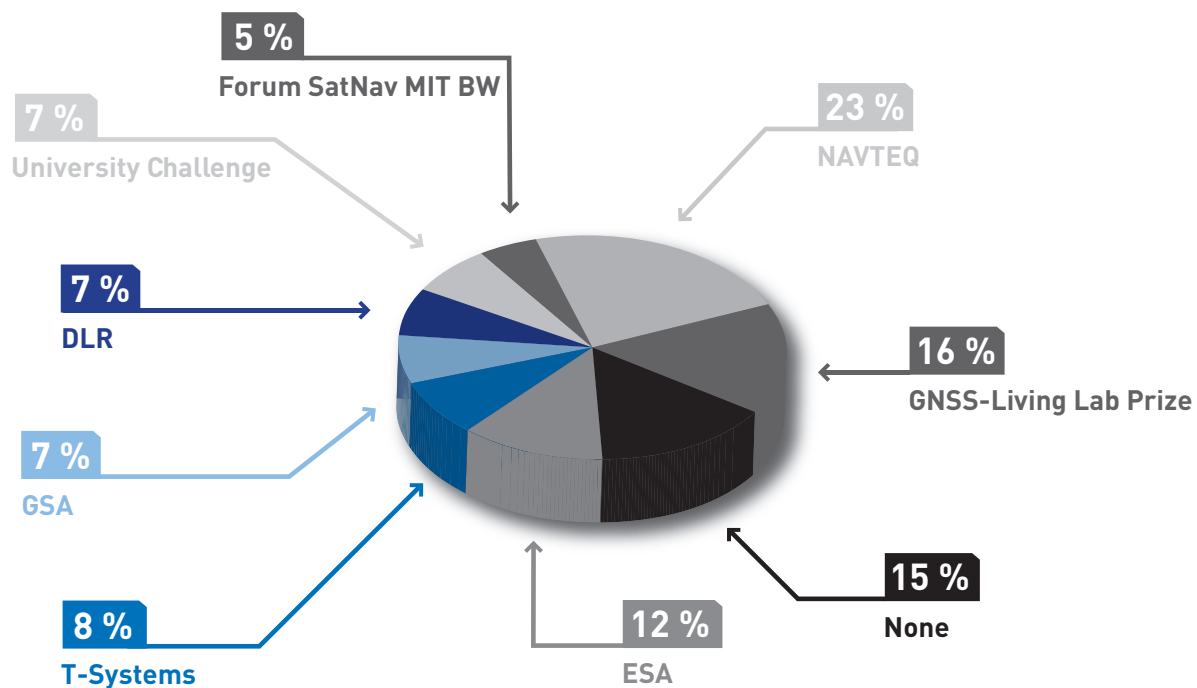
2010
THE RESULTS
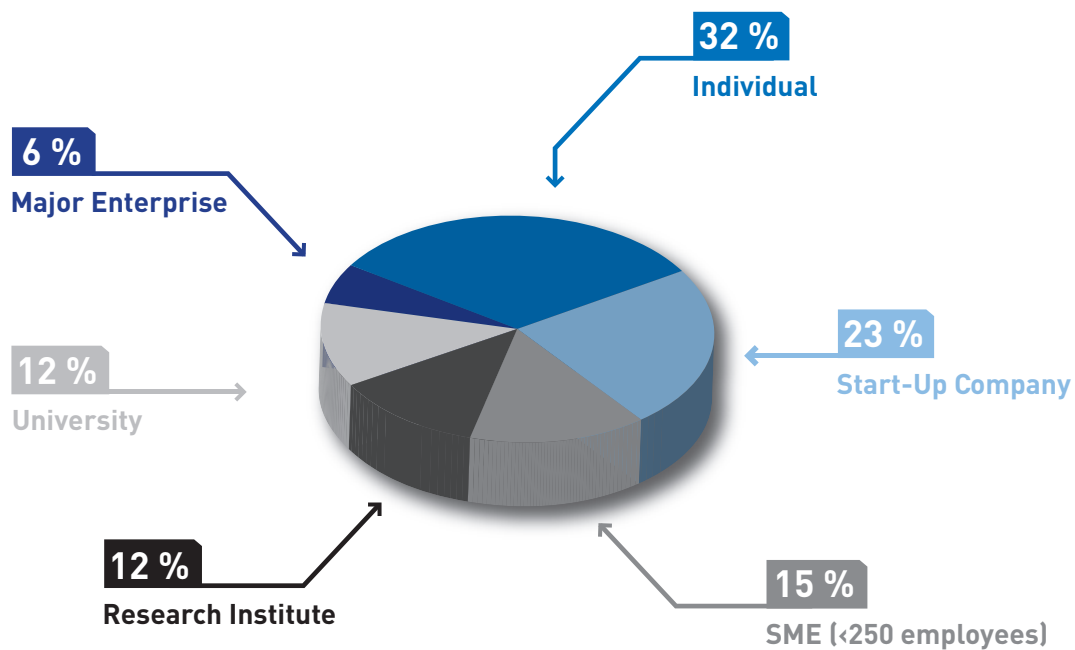## EUROPEAN
SATELLITE NAVIGATION
COMPETITION

TABLE OF CONTENTS

Participation in the 2010 Special Topic Prizes

5 %
Forum SatNav MIT BW

7 %
University Challenge

23 %
NAVTEQ

7 %
DLR

16 %
GNSS-Living Lab Prize

7 %
GSA

8 %
T-Systems

12 %
ESA

15 %
None

Form of Organisation

32 %
Individual

6 %
Major Enterprise

23 %
Start-Up Company

12 %
University

12 %
Research Institute

15 %
SME (<250 employees)

Ideas from Countries

Country	Value
Sweden	
China	
Lithuania	
Czech Republic	
India	
Israel	
Russia	
The Netherlands	
USA	
France	
Italy	
Spain	
Taiwan	
United Kingdom	
Germany	
Other*	

0 %   5 %   10 %   15 %   20 %
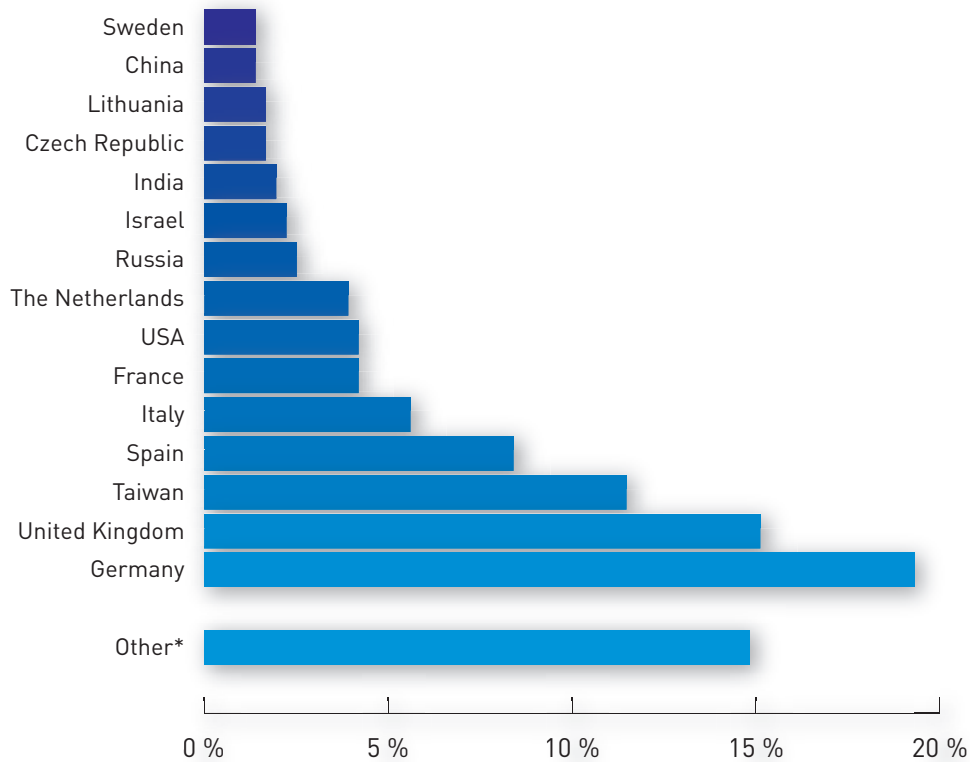
*Albania, Australia, Austria, Belgium, Denmark, Egypt, Estonia, Finland, Greece, Hungary, Indonesia, Ireland, Malaysia, Malta, New Zealand, Pakistan, Poland, Portugal, Romania, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, Switzerland,Turkey, Ukraine, United Arab Emirates

Participants 2004–2010

Year	Registrations	Complete ideas
2004	48	14
2005	86	22
2006	125	57
2007	258	141
2008	525	293
2009	448	289
2010	548	357

■ Registrations   ■ Complete ideas
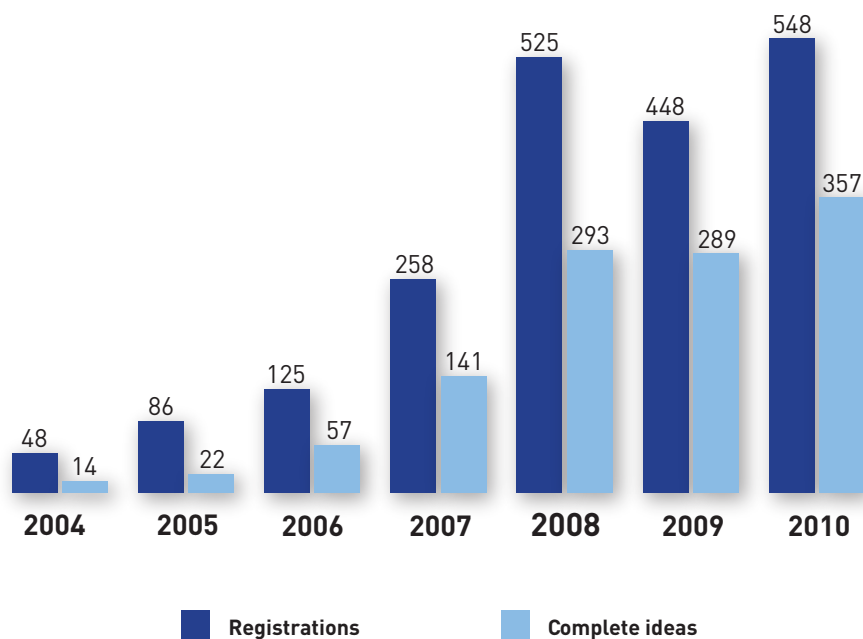
ESNC - Total Market
357 Ideas

10 %

Professional

19 %

Safety of Life

71 %

Mass Market

Safety of life

Category	Value
Road-ADAS	
Police	
Crisis teams	
Ambulance / Emergency services	
Early warning system	
Aviation	
Search and rescue	

0 %   5 %   10 %   15 %   20 %   25 %

Mass Market

Category	
Entertainment (e.g. Location Based Imaging)	
Education	
Cars	
Social Networking (Peer-to-peer, Find-me)	
Personal Outdoor Recreation / Sports	
Transport	
Remote Monitoring (e.g. Children, Pets, Seniors)	
Content Providing POI Data, Dynamic Data	
Healthcare (e.g. Safety Alerts)	
Travel / Tourism	
Navigation	
Other*	

Axis: 0 % — 5 % — 10 % — 15 % — 20 % — 25 %

*Enterprise applications (e.g.inventory, buying, billing), Buses / Public transport / Car sharing, Fleet management, Gaming, Power management / CO_2

Professional Applications

Category	
Meteorological Forecasting	
Lone Worker Protection	
Inland Waterways	
Energy	
Bank	
Precision Agriculture	
Construction / Civil Engineering	
Logistics (e.g. Route Optimisation)	
Geodesy / GIS / Land Survey	
Aerospace	
Environment	
*Other	

Axis: 0 % — 5 % — 10 % — 15 % — 20 % — 25 %
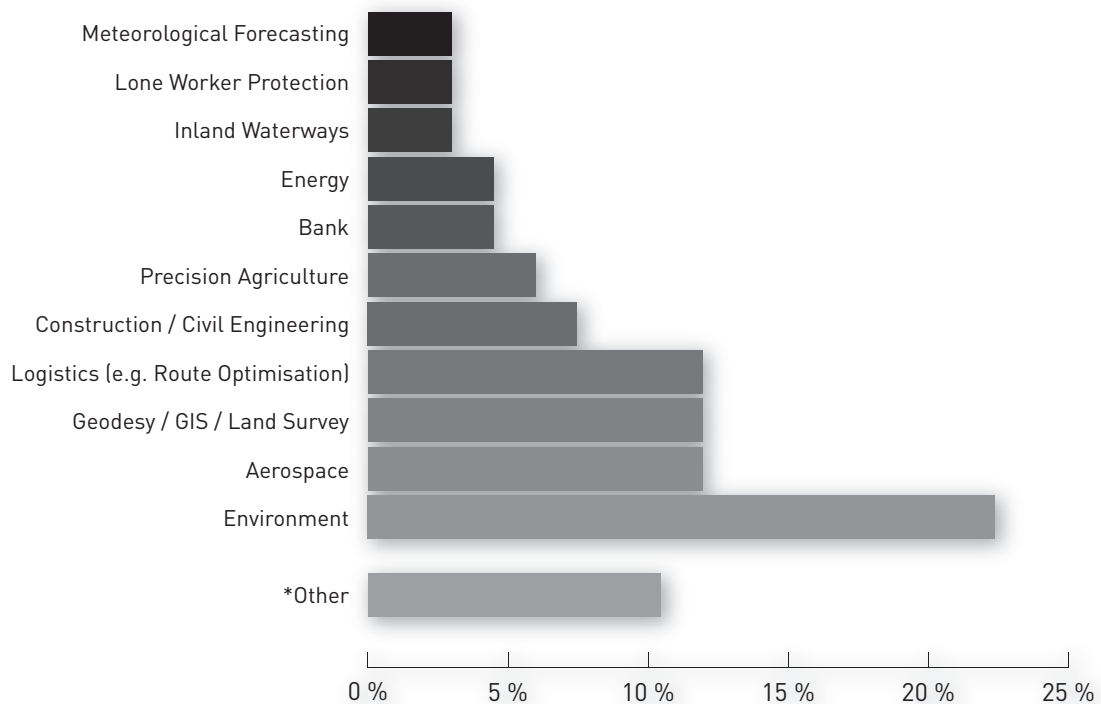
*Dangerous goods tracking, Maritime, Oil and gas, Receivers / Signal verification, Timing, Toll collection

ESA BIC – One out of three Incubatees

52
Other Incubatees
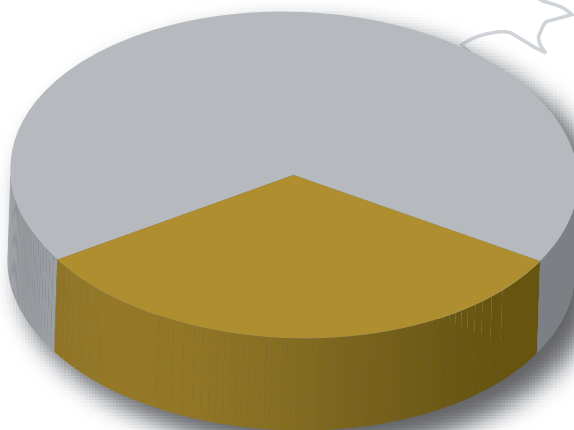
25
ESNC Participants

14
Participants
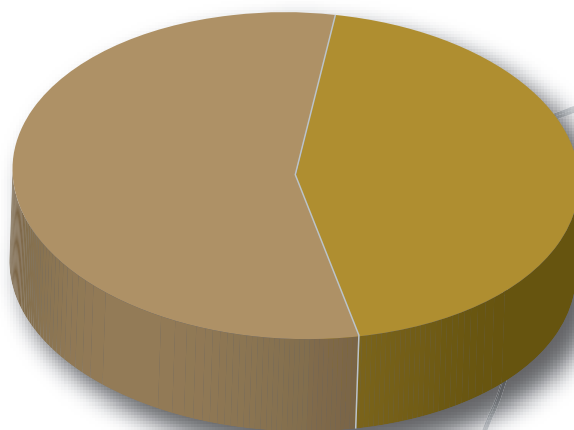
11
Winners

Status October 2010

coming from ESNC

ESA BIC Noordwijk

ESA BIC Darmstadt

ESA BIC Oberpfaffenhofen

ESA BIC Italy
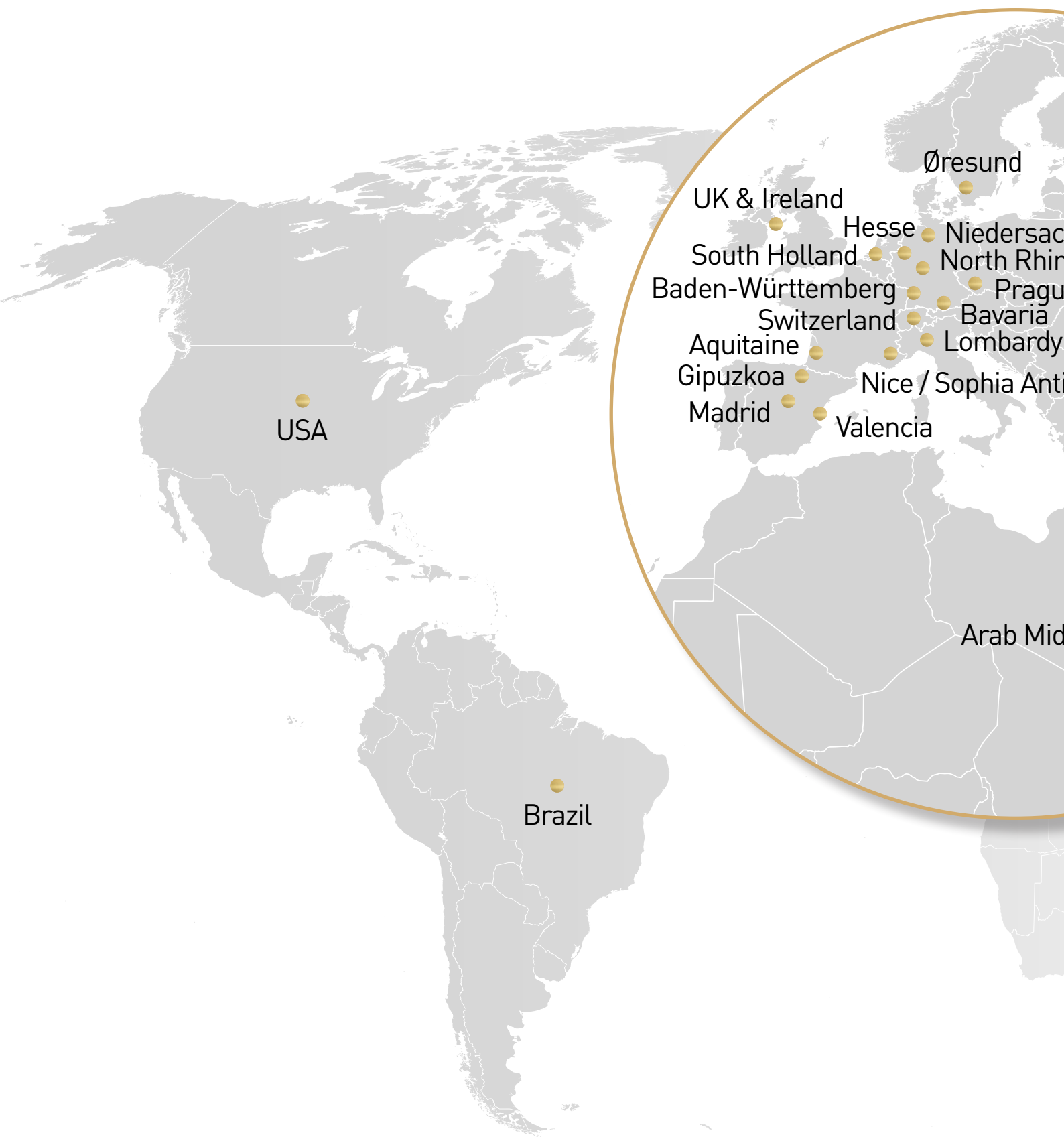
USA

Brazil

Øresund

UK & Ireland

Hesse

Niedersac

South Holland

North Rhi

Baden-Württemberg

Pragu

Switzerland

Bavaria

Aquitaine

Lombardy

Gipuzkoa

Nice / Sophia Anti

Madrid

Valencia

Arab Mid

Lithuania

hsen

e-Westphalia

e

ipolis

Israel

dle East & North Africa

Taiwan

Australia

1. Germany
2. United Kingdom
3. Taiwan
4. Spain
5. Italy
6. France
7. USA
8. The Netherlands
9. Russia

Countries from where ideas have been submitted

The Finalists
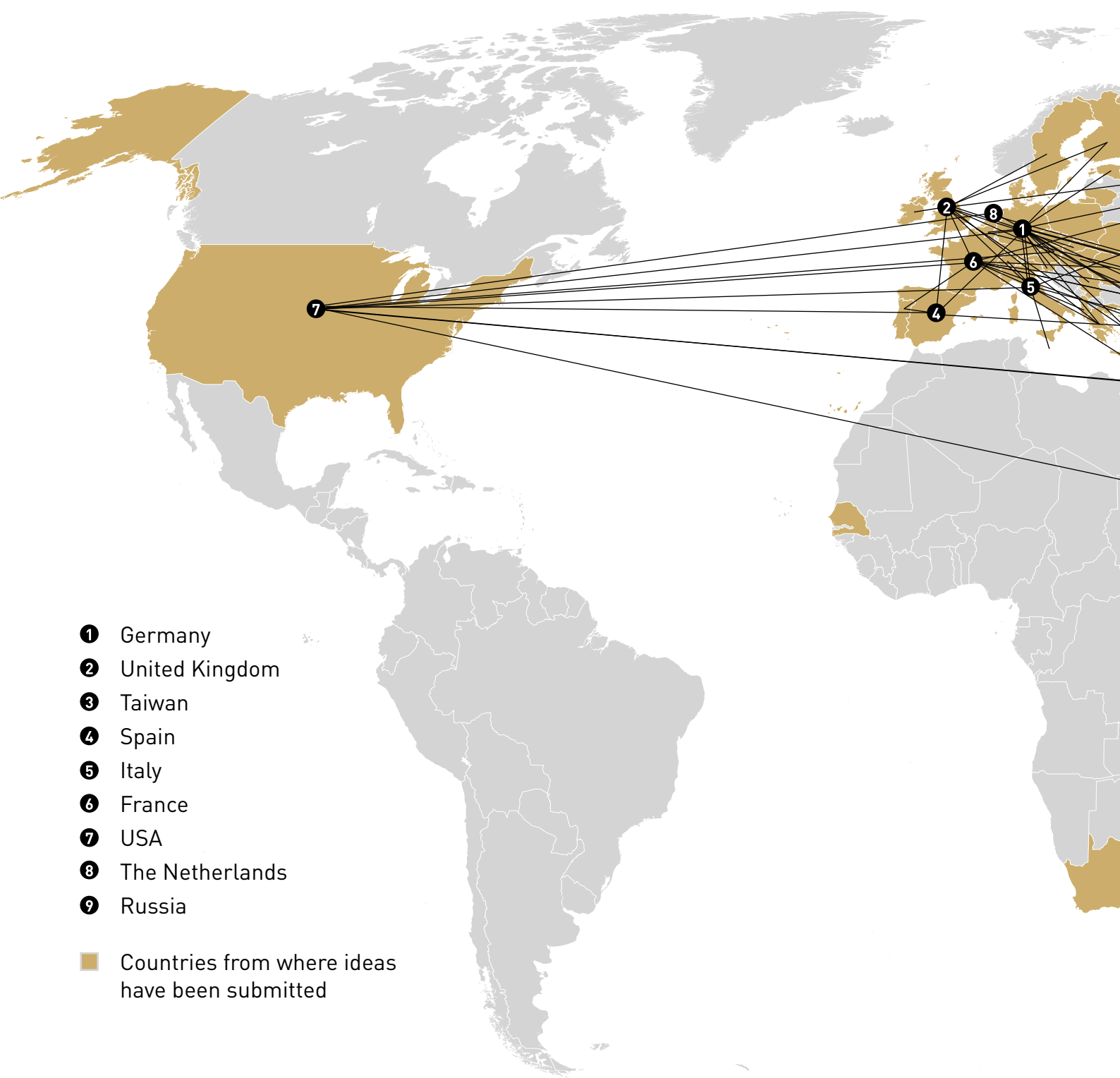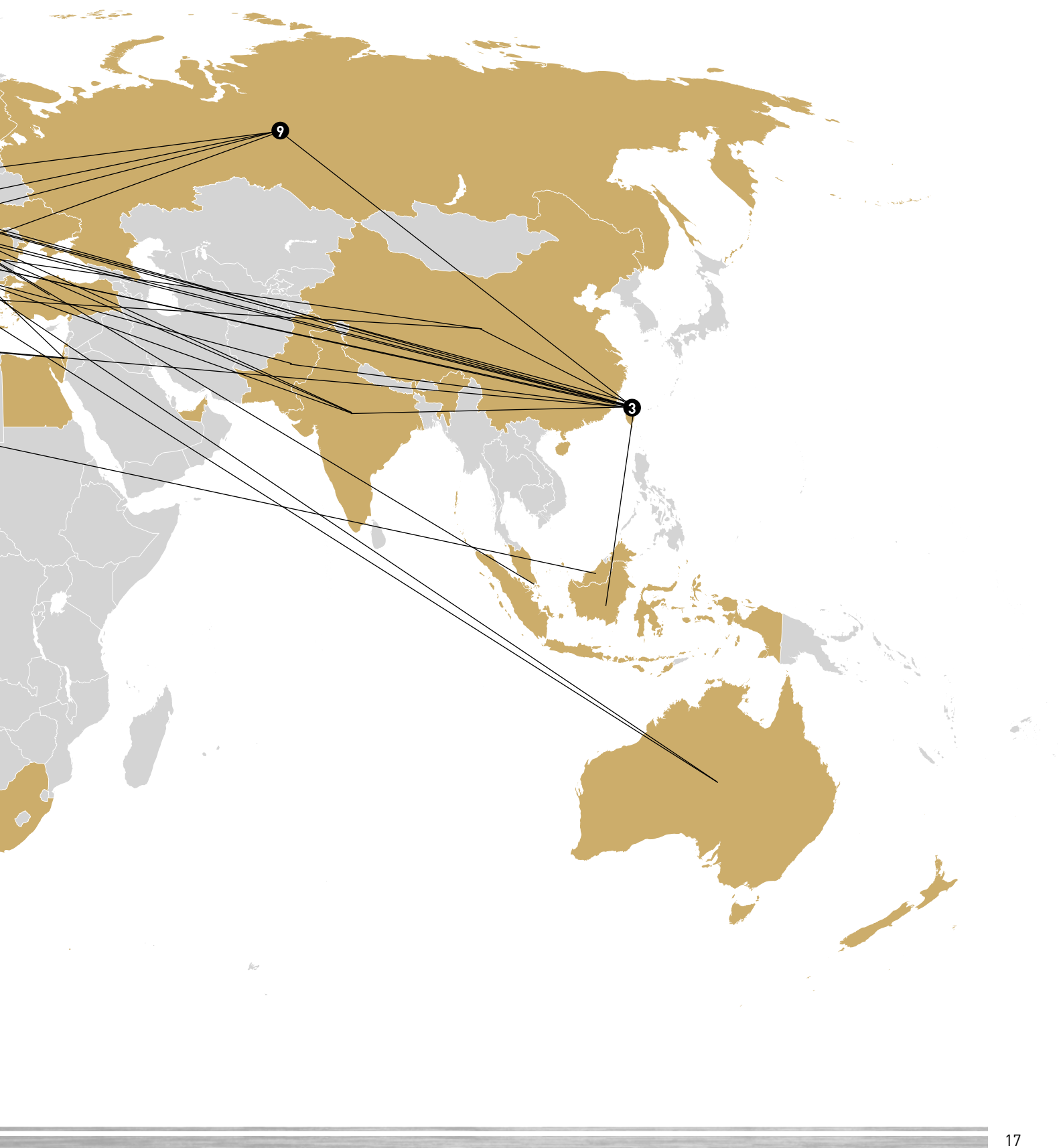
GALILEO
Masters

The Winners

**Philipp Breuss-Schneeweis |
Rainhard Findling | Nicola Radacher |
Sebastian Höbarth | Andreas Hauser**

The Idea

**Wikitude Drive –
Augmented Reality Navigation**

The Prize **GSA**

By developing a new generation of Global Navigation Satellite Systems (GNSS), Europe is opening new doors in high-tech industry development, job creation, and economic growth. EGNOS (European Geostationary Navigation Overlay Service) is Europe's first venture into satellite navigation. It augments the US GPS and Russian GLONASS systems, and makes them suitable for safety-critical applications. With the EGNOS open service now free and ready to use the focus of the GSA prize is on EGNOS, looking for innovative satellite navigation applications that make use of EGNOS signals or services and meet the following criteria:

- End-to-end functionality to customers using new or existing equipment and systems
- Positioning as a key enabler of the application
- GPS + EGNOS as primary means of positioning
- EGNOS functionality

DESCRIPTION

Wikitude Drive is the worlds first fully functional mobile Augmented Reality navigation system with global maps. It is a light-weight turn-by-turn navigation system that uses Augmented Reality (AR) to draw driving instructions directly onto the live video stream of your smartphone.

Wikitude Drive distinguishes itself from other navigation systems in two ways: First, by superimposing directions onto a live video stream of the driver's surroundings, he or she can easily recognise and follow the suggested route. Instead of an abstract map, the driver looks at the real world and can simply follow a line.

Secondly, Wikitude Drive solves a key problem of all other navigation systems, namely the way they force drivers to take their eyes off the road in order to look at an abstract navigation map. Since Wikitude Drive provides you with driving directions on top of a live video stream, you still see what is happening ahead of you when looking at your navigation system's display.

Wikitude Drive works very well with the GPS system available today and proves that this technology is viable. However, due to the inaccuracy of GPS, driving directions are not fully superimposed onto the real street. We believe that augmented reality navigation will really take off once EGNOS is in place, mainly because of its improved accuracy, faster positioning signal, and more accurate altitude detection.

WIKITUDE
drive

Photo: Wikitude Drive uses Augmented Reality to draw driving instructions directly onto the live video stream of your Android smartphone. Wikitude Drive will be available in the Android Market early November 2010.

INNOVATION

The innovation in Wikitude Drive is clearly the use of augmented reality: Driving instructions are drawn directly onto a smartphone's live video stream and thus onto the road, replacing the conventional maps all other navigation systems use.

TARGET MARKET

Wikitude Drive will initially target early adopters, because using augmented reality for driving is still a new and unproven concept. In a later phase, Wikitude Drive will be marketed as a navigation system for all drivers, as well as for pedestrians. Wikitude Drive will be available in the Android Market early November 2010.

CUSTOMER BENEFIT

First of all, many people have problems reading maps, which provide an abstract image of reality and are therefore hard to understand. Second, people who read maps have to "translate" them to reality. And finally, map reading is not only difficult – it also takes time. Looking at a map of a navigation system requires the driver to take his or her eyes off the road. Just by looking at the map for one second when driving at 100 km/h (62 mp/h), the driver is actually "blind" for 28 metres (92 ft). Think about how much can happen over such a distance. Since Wikitude Drive provides you with driving instructions on top of a live video stream, you still see what is happening ahead of you when looking at the display of your navigation system.

"With Wikitude Drive, I don't find myself looking for directions; the device itself guides me along the way," says Nicola Radacher, product manager at Mobilizy.

MOBILIZY
SMARTPHONE SOLUTIONS

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The Decision

The GSA was looking for the most promising application exploiting the special features of EGNOS. Why did you choose Wikitude Drive?

WikitudeDrive is an innovative and useful application that takes road navigation a step forward by realising the concept of augmented navigation. It takes advantage of breakthroughs in the smartphone market and has strong market potential. We were impressed by the mature, professional development team behind the application and the fact that a working version is already available. We also liked the idea of making the system interoperable and scalable by providing an open API for third-party application and content developers.

How is EGNOS helping WikitudeDrive – with its improved integrity and accuracy, for instance?

EGNOS corrections will provide enhanced performance in situations where GPS is not accurate enough. Augmented-reality navigation needs the precision and integrity provided by EGNOS to make sure it overlays driving directions correctly on the road. EGNOS can also factor altitude into the generation of driving directions.

WikitudeDrive will be launched in the coming days; do you think augmented-reality navigation will be a new trend?

WikitudeDrive represents the next generation of navigation systems. Augmented reality is enhancing the driving experience and increasing safety by contributing to the development of Advanced Driver Assistance Systems. WikitudeDrive uses smartphones rather than proprietary devices, which is the trend we have observed in the consumer market for road navigation.

The Experts

Boris Kennes
R&D and Market Monitoring Officer
European GNSS Agency (GSA)

Carmen Aguilera
Market Development - R&D Officer
European GNSS AGency (GSA)

Phillipe Hamet
Policy Officer
(Galileo Applications TREN.G4)
European Commission

Cédric Seynat
Programme Officer
(EGNOS Programme TREN.G3)
European Commission

About **European GNSS Agency (GSA)**

By developing a new generation of global navigation satellite systems (GNSS), Europe is opening new doors for high-technology industry development, job creation and economic growth. With Europe in the driver's seat, Galileo has the potential to become a cornerstone of the global radio navigation positioning system of the future. Given the strategic nature of European satellite positioning and navigation programmes, (which include Galileo and EGNOS) the European GNSS Agency, a European Community Agency, was established in 2004 to be the regulatory authority for the European GNSS Programmes, while laying the foundations for a fully sustainable and economically viable system.

The GSA will:

• Ensure the security accreditation of the system and the operation of the Galileo security centre;

• Contribute to the preparation of the commercialisation of the systems with a view to a smooth functioning, seamless service provision and high market penetration;

• Accomplish other tasks entrusted to it by the Commission, in particular the promotion of applications and services and ensuring the certification of the components of the systems.

www.gsa.europa.eu

The Winner

Helmut Drewes

The Idea

Agrista – an Online Technology Platform that Minimises the Risk of Funding Agricultural Projects
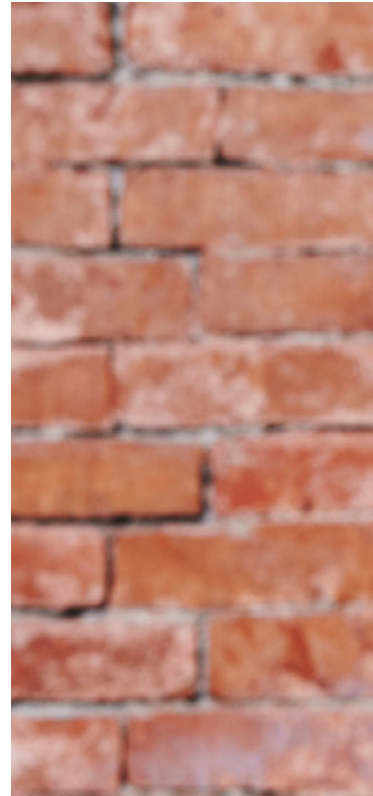
The Prize **GMES Masters**

Global Monitoring for Environment and Security (GMES) is a corner stone of the European Union's space strategy and, after Galileo, the next space-related flag ship initiative. GMES is driven by the requirements of sustainable development and the need to improve the monitoring of the European and global environment especially in view of sustainable management of resources and the security of the citizens. The GMES Masters award was searching for integrated and customised solutions for completely new business areas and emerging business cases as well as enhancements of existing applications for the GMES core services – land, marine and emergency.

DESCRIPTION

Agrista aims to reduce the risk of funding agricultural projects and thereby make more funds available to farmers, especially in emerging markets. This is a vital component in increasing the agricultural production needed to match a growing global demand for agricultural commodities. To support this objective, Agrista provides an online technology platform that enables the provision of financing into these markets.

Farmers are given access to an online application where they can store registers of their farming assets and prepare business plans required for credit analysis by financiers. A farmer's production history is also stored online, providing a reliable record of performance. Farmers can exchange data with their advisors, investors, suppliers, and customers to create a collaborative business network.

Agrista also provides an online application that agribusinesses can use to manage the origination of agricultural production loans and credit facilities. Companies involved in the agrifinancing process – insurers, commodity brokers, and financiers – also have access to the application.

Photo: Father and son farmers by tractor near field. © Vicki Reid / iStockphoto

About the Company

About the Innovator
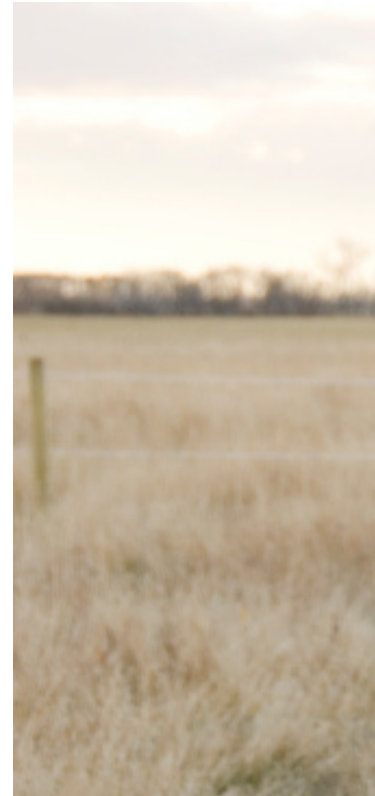
INNOVATION

Agrista seamlessly integrates geodata into an online application that, for the first time, gives users in the agricultural financial services industry easy access to location-based services in the context of their business.

Farm boundaries and fixed improvements are located spatially on the Agrista platform using high-resolution satellite imagery to assist financiers in assessing the value of farmers' assets. Agrista also remotely monitors crops using satellite-based sensors. In combination with crop sampling guided by satellite navigation, these sensors are able to develop yield expectations ahead of the harvest in near real-time, which is vital information for financiers and insurers.

TARGET MARKET

At the G8 Summit in Italy in 2009, political leaders recognised that the old model of development aid is no longer sufficient to address the growing global food crisis. To feed a growing world population – expected to surpass 9 billion in 2050 – the FAO estimates that agricultural output will have to increase by 70% between now and then. They estimate that an additional €29.6 billion must be invested annually in agricultural production in emerging economies over this period. Agrista aims to enable these required funds to be delivered to these markets, specifically Africa, eastern Europe and South America.

CUSTOMER BENEFIT

Agrista's solution gives financiers increased insight into decisions concerning agricultural credit. They also ensure that all funds delivered to agricultural projects are controlled and that administrative errors are reduced.

Insurance companies and commodity brokers can also access the platform to offer integrated services that further reduce the credit risk financiers face. As a result, farmers can access financing that previously was not available in emerging markets.

agrista

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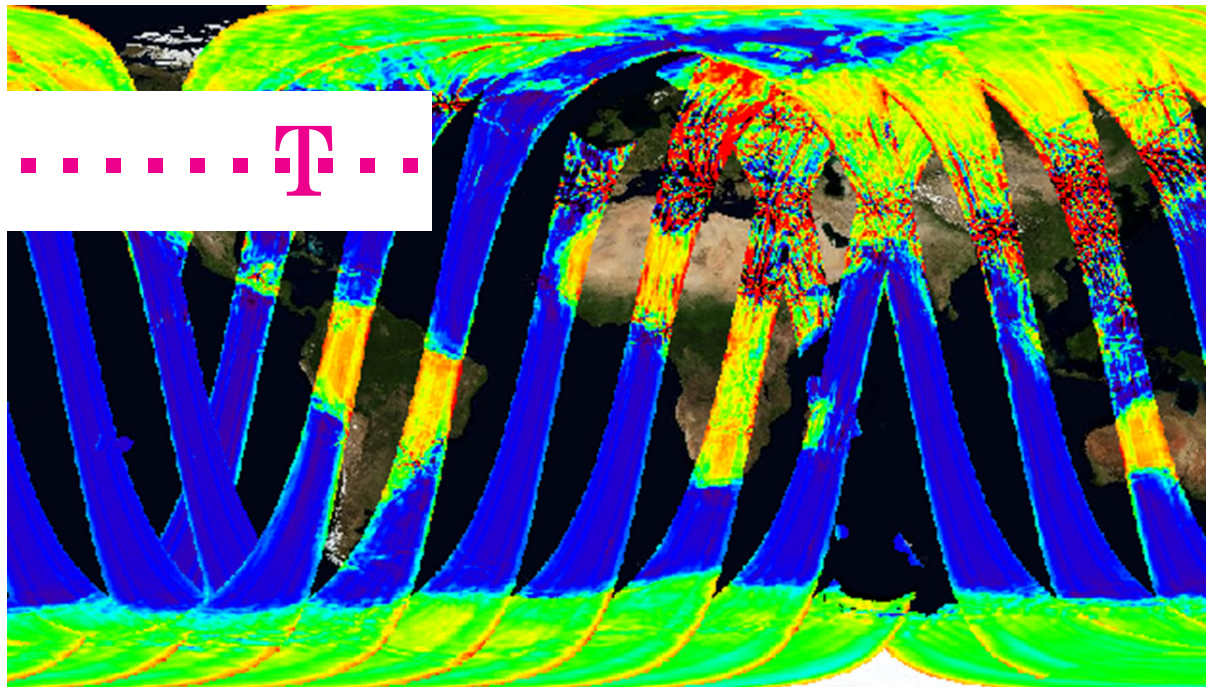
The Decision

T-Systems was looking for an intelligent healthcare solution to support the elderly in their everyday lives. What is the most innovative aspect of Aiper-Care?

If an individual leaves the house alone at night, a mobile solution attached to the clothing automatically sends a message to the caregiver, who can determine the individual's current position using the navigation system and send help. The technical components of the idea won us over with their clever combination of motion sensors for activity detection based on typical movement patterns and emergency profiles with satellite positioning and mobile communications.of the harvest in near real-time, which is vital information for financiers and insurers.

Does the application meet your requirements with respect to, for example, usability, wearability, and hard- and software components?

The application has very promising features: For instance, it can be integrated into fabric and cannot be removed actively or by accident. Prototypes are available that already meet a lot of relevant requirements, from usability and robustness to improved battery life.

What was the convincing element of the business model?

This idea has the capacity to improve the quality of life of its target users and their caregivers enormously without being too obtrusive to anyone involved in its application.

The Experts

Jurry de la Mar
Head of International Sales,
Public Sector
T-Systems International GmbH

Dr Thomas Beer
GMES Policy Coordinator,
GMES Space Office
European Space Agency (ESA)

Prof Dr Axel Küpper
Head of Service-centric Networking
Deutsche Telekom AG - T-Labs

Thomas Leiber
Corporate Customers
T-Systems International GmbH

Jan Ortlepp
Vice President,
Federal Authorities & EU
T-Systems International GmbH

Bernhard P. Ruff
Head of Support & Geo-Services
T-Systems International GmbH

Roland Schwaiger
Leader Convergent Services &
Platforms, Innovation Development
Deutsche Telekom AG - T-Labs

Sascha Steiner
Innovation Center
T-Systems International GmbH

The role of T-Systems and ESA in the GMES programme

The European Space Agency (ESA) is the Coordinator of the GMES Space Component which means collecting earth observation data from satellites. ESA also leads the development and implementation of the GMES space infrastructure.

T-Systems operates information and communication technology for large corporations and public institutions. For example, T-Systems is the company behind the world's most sophisticated road-charging system – Toll Collect. Today, T-Systems runs one of the global networks through which GMES data is distributed to users around the world.
www.t-systems.com // www.esa.int

About **T-Systems**

Drawing on a global infrastructure of data centers and networks, T-Systems operates information and communication technology (ICT) systems for multinational corporations and public sector institutions. T-Systems provides integrated solutions for the networked future of business and society. The company's some 45,300 employees combine industry expertise and ICT innovations to add significant value to customers' core business all over the world. T-Systems generated revenue of around EUR 8.8 billion in the 2009 financial year. **www.t-systems.com**

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The Finalists

The Winners

Rafael Olmedo | Luis Burillo

The Idea

**NEPA – Wireless Water Watcher
Navigator System**

The Prize **ESA Innovation Prize**

An international organisation comprising 18 member-states, the European Space Agency (ESA) is Europe's gateway to space. Its mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world. ESA also aims to find new ideas for the commercial use of space technology and launch new businesses in this area in Europe. Regarding its innovation prize ESA was looking for ideas that can be implemented immediately and quickly nurtured into a profitable business with the technical and financial assistance of an ESA business incubator.

DESCRIPTION

In streams and irrigation channels, wastewater runoff can quickly affect water quality and cause ecosystem degradation. Detecting sources of water pollution along minor waterways is of primary interest to authorities trying to uncover illegal activities and specific sources of water quality degradation.

Since most the rivers and channels are not navigable, it is difficult to collect continuous information along their entire length. Nowadays, technology only allows monitoring in certain spots, which also hinders the process of identifying accurately where and when water quality changes.

NEPA introduces a solution that can detect variations in electro-chemical indicators of water quality autonomously over long stretches of a waterway. NEPA will also enable authorities to locate different wastewater inflows and quantify their relative importance.

Photo: Water pollution along minor waterways can affect water quality and cause ecosystem degradation.

About the Company

About the Innovators

INNOVATION

The innovation of NEPA lies in the intelligent combination of satellite navigation, wireless communication, and electronics technologies in order to acquire and communicate the analytical parameters of waterways. Both remotely and in real time, the NEPA system alerts the observer to the presence of water contamination by indicating and locating the existence of certain substances or monitoring certain water parameters.

TARGET MARKET

NEPA introduces an advanced system for waterway quality monitoring, providing a valuable tool for professionals and institutions involved in water provision, water pollution investigation, and environmental research. Its market will consist of wetland conservation technicians, technical organisations and services related to water resources and spill control, environmental police and nature protection services, companies involved in water provision or environmental and landscape recovery, and environmental forensics.

CUSTOMER BENEFIT

- Provides an innovative, real-time, and low-cost solution for remote water-way quality monitoring

- Involves the easiest and cheapest spatial analysis of water quality parameters, enabling users to reduce cost and effort

- Flexibility and adaptability to different environmental conditions and applications depending on the user's needs

Mr Rafael Olmedo, Mr Luis Burillo
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e-mail: info@navmote.com
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e-mail: olmedor@inta.es
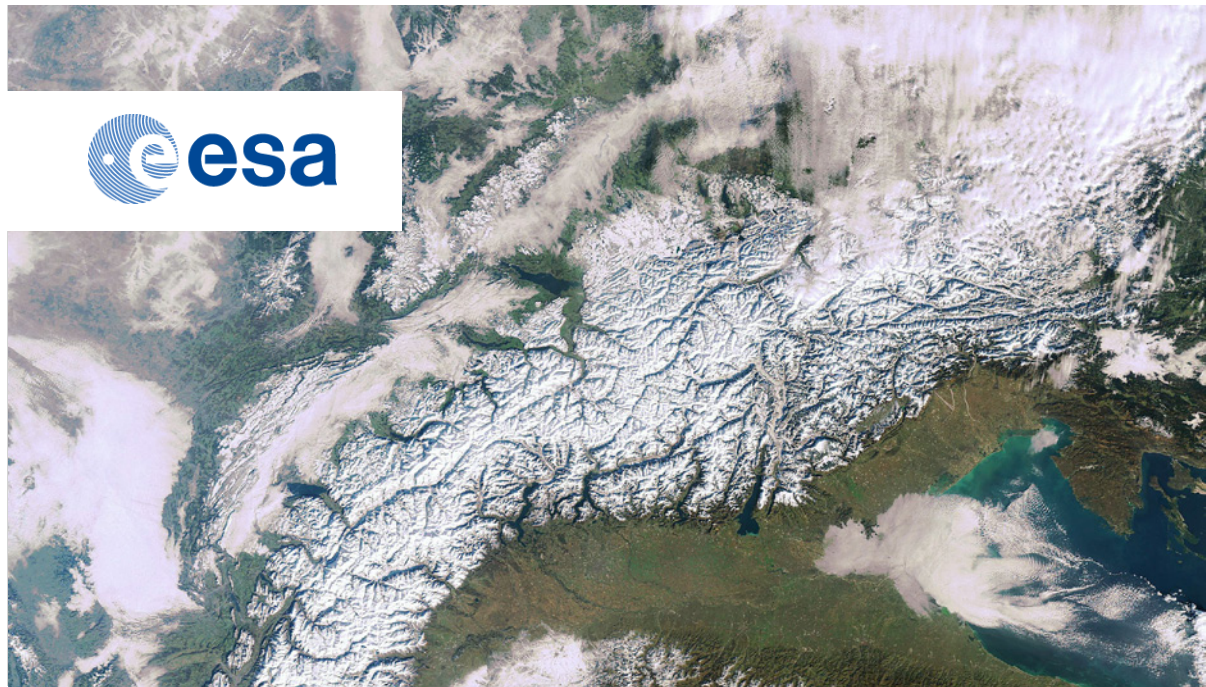
The Decision

ESA was looking for a business case that can be implemented immediately and quickly nurtured into a profitable business. What convinced you that NEPA will be a commercial success?

Only 3% of the water supply on earth is freshwater, of which an even smaller percentage can be found on the earth's surface (accounting for less than 0.01% of all the water on the planet). It is vital that we take care of our freshwater reserves, but cases of leaking depots and illegal discharges are still presented all too often in the news. NEPA addresses this problem with a cost-effective system that can monitor specific incidents of river and canal pollution whilst performing GNSS tracking, thus providing environmental forensics and companies involved in water provision and landscape recovery with a new generation of tools.

What do you think of the innovative nature of the proposed approach?

The different technologies for measuring and tracking water pollution are already there and can be rapidly implemented in the product. NEPA's innovation lies in how it combines these technologies into one new system that can autonomously track pollution.

What will be the next steps to facilitate joint implementation?

In order to make this a commercial success, NEPA will still have to work on its business and revenue model. The next step for them is to file a proposal with one of our ESA Business Incubation Centres (ESA BICs) so we can help them transform this idea into a viable business. We are confident that the award will jump-start this process.

The Experts

Bruno Naulais
European Space Incubators
Network Manager
European Space Agency (ESA)

Koen DeBeule
Electronic Design Engineer
European Space Agency (ESA)

Niels Eldering
Technology Transfer Officer
European Space Agency (ESA)

Herve Joumier
Head of ESA Cost Engineering
European Space Agency (ESA)

Callum Norrie
Technology Transfer Officer
European Space Agency (ESA)

Frank M. Salzgeber
Head of Technology Transfer
Programme Office
European Space Agency (ESA)

Javier Ventura-Traveset
Head of ESAC Communication &
Education Office
European Space Agency (ESA)

About **European Space Agency (ESA)**

The main mission of the Technology Transfer Programme (TTP) of the European Space Agency (ESA) is to facilitate the use of space technology and space systems for non-space applications and to further demonstrate the benefit of the European Space Programme to European citizens.

The Technology Transfer Programme Office is responsible for defining the overall approach and strategy for the transfer of space technologies and systems, including the incubation of start-up companies and its funding.
www.esa.int/ttp

Photo: Estación de Robledo (MDSCC), Madrid.
© Luis Fernández Rojo
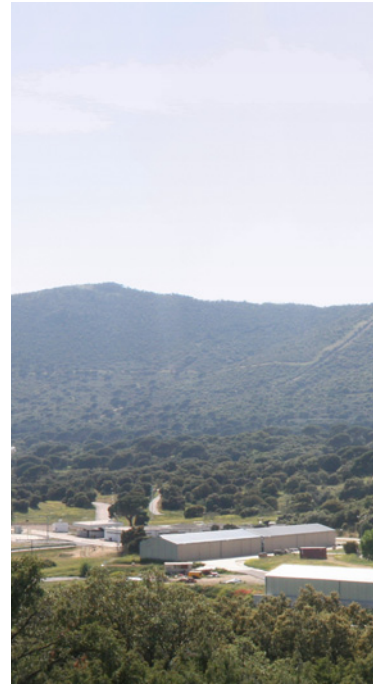
The Region Madrid

The region of Madrid is the centre of excellence for the aerospace sector thanks to the presence of the leading sector companies and the most relevant research and training institutes. Madrid Regional Government has officially declared the aerospace industry as a strategic sector. 74.9% of Spain's aeronautic engineers work in Madrid. It has the largest Aeronautic Engineering School; top-class non-university programs and the most prestigious post-graduate and business schools. Over 60% of the aerospace sector employment and 62% of its annual turnover in Spain is concentrated in Madrid, including key institutions that increase technology transfer and leverage technological cooperation: INTA - National Institute of Aerospace Technology; CIEMAT – Centre for Energy, Environment and Technological Research; aeronautical and telecommunications engineering schools.

Comunidad de Madrid

The regional organiser **IMADE**

IMADE, the Madrid Regional Institute of Development, is an organisation that falls under the aegis of the Economic Affairs Department of the Madrid Regional government. Founded in 1984 as a public body, its main objectives are to promote development in the region through initiatives that encourage economic growth and employment. IMADE provides local companies and entrepreneurs with services aimed at encouraging innovation, business creation and enhanced competitiveness. It is an instrument of the regional government to foster, develop and strengthen business networking in the Madrid region, promote the creation of employment, and achieve higher productivity and competition rates at both the national and international level. IMADE has various strategic channels of activity designed to promote balanced, sustainable development in the entire region of Madrid. One of the main goals of the institute is to provide high-quality physical spaces for production network operations in accordance with their real needs, including innovative technologies, globalisation and competitiveness, and environmental and knowledge management. **www.imade.es**

Instituto
Madrileño
de Desarrollo

Madrid Network
CLUSTER
AEROESPACIAL
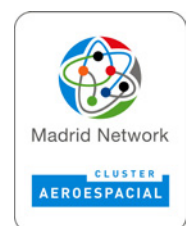
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The Winners

**Gabriele Colosimo | Mattia Crespi |
Augusto Mazzoni**

The Idea

**VADASE (Variometric Approach for Dis-
placements Analysis Stand-alone Engine)**

The Finalists

The Prize **Next Generation Navigation**

As Germany's national research center for aeronautics
and space DLR is responsible for the forward planning
and implementation of the German space programme. In
determining the focal points of its research, DLR is guided
by industry's growing demand for innovative products and
services. DLR was looking for creative ideas for new ap-
plications, products, and services, as well as concepts
transferable from nature. Better understanding and usa-
bility will pave the way to a new quality of navigation with
remarkable added value. Specifically, DLR was searching
for the brightest ideas in the fields of safety-critical appli-
cations and bio-engineering in navigation.

DLR

DESCRIPTION

This is a novel strategy consisting of an algorithm able to perform real-time retrieval and estimation of displacement and waveforms based on high-frequency (1Hz or more) carrier phase observations collected by a stand-alone GNSS receiver.

The algorithm works with broadcast products (satellite clocks and orbits) and requires very simple hardware. These characteristics allow our solution to be directly embedded into receiver firmware and permit to estimate, in real-time and without any need for corrections from other sources, the receiver displacements.

Although such an ingenious idea can be applied to several different problems, we focus on two we believe are most important: earthquake risk assessment (and related early-warning systems for tsunamis) and structural monitoring.

WINNER OF THE SPECIAL TOPIC PRIZE
DLR

Figure: Baja (Mexico) earthquake, MW 7.2, April 04 2010, 22:40:42 UTC. Station P496 – variometric BRD solution over the 200 seconds interval 22:40:40 – 22:44:00, YYDOY 10094 GPS time, for direct comparison with the waveforms and coseismic displacements recovered by Kristine Larson at the University of Colorado at Boulder
www.unavco.org

INNOVATION

The major advancement of the proposed solution introduces a novel strategy in performing real-time estimation of coseismic displacement and waveforms accurate down to a few centimetres. Given the fact that it requires no centralised data analysis, no external corrections for the algorithm to work, and no particularly powerful hardware, the solution can be embedded directly into receiver firmware. This framework enables VADASE to fulfil some of the recommendations recently adopted by the scientific community (2007, Leavenworth) – in particular, the possibility to achieve 1-cm real-time GNSS displacement accuracy in a global reference frame within three minutes after an earthquake.

TARGET MARKET

The immediate fields of application include high-frequency real-time monitoring in seismology and tsunami early-warning systems, as well as the monitoring of structures and geotechnical engineering; oscillation monitoring for different types of structures (buildings, skyscrapers, dams, etc); and safety monitoring for infrastructure elements (railways, highways, etc) close to potential hazard (landslides, etc).
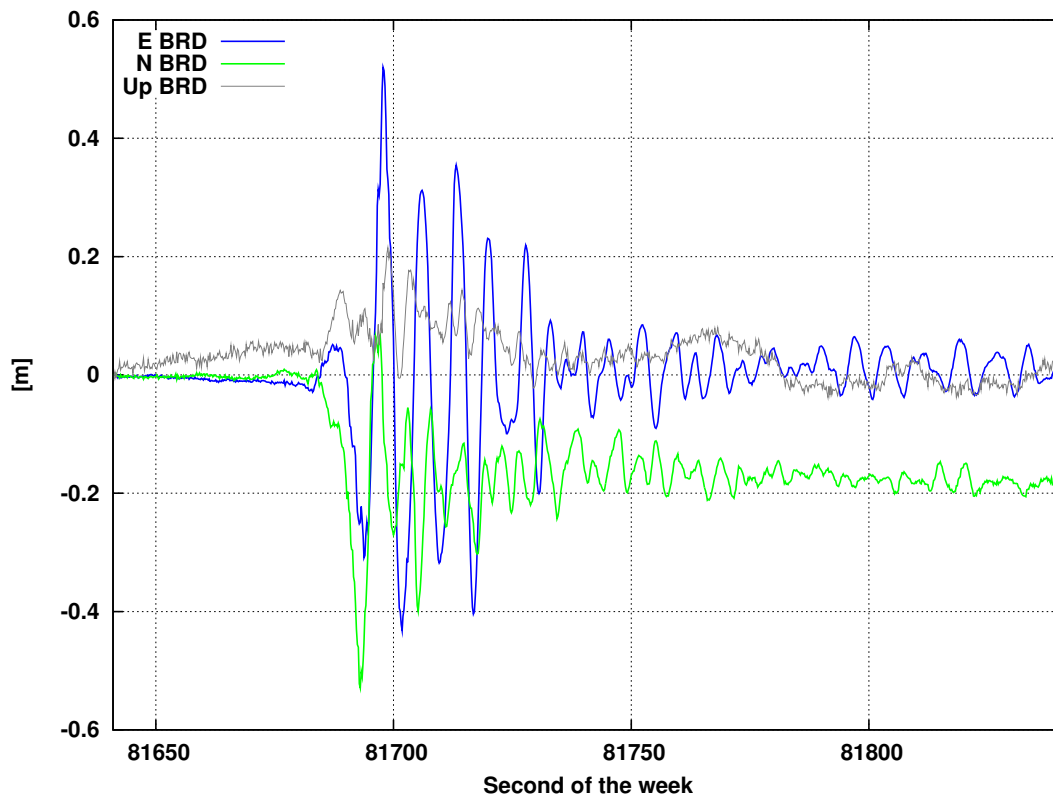
CUSTOMER BENEFIT

Public administrations in charge of surveying and monitoring areas suscep-tible to earthquakes or tsunamis, as well as all civil protection departments responsible for monitoring infrastructures that experience oscillations, can take advantage of this idea. In particular, the real-time capability of the sys-tem – together with the possibility to embed VADASE into existing sensors' firmware – makes it a low-cost monitoring solution. In fact, the system is completely self-reliant and needs no additional network infrastructure.

University of Rome „La Sapienza"
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The Decision

DLR was looking for next-generation navigation; what makes the selected solution outstanding and forward-thinking?

VADASE meets our expectations perfectly. Science is generating real added value for the benefit of society, with satellite navigation as a core technology. Yet the most convincing aspect is its simplicity: Taking a very low-cost approach, it is based solely on single-frequency receivers and requires no external infrastructure. Using existing standard technology helps avoid development risks. Especially in hazard monitoring and civil protection, we need innovative ideas as sophisticated and solution-oriented as this one to obtain information better and faster. VADASE is a boon for affected areas and people needing protection.

In which field do you see the biggest potential for commercial realisation, and which competencies will DLR bring in to foster further development?

The variometric approach enables the monitoring of seismic activity, be it large-scale earthquakes or minor local shifts that threaten buildings and other infrastructure or cause landslides. DLR is an ideal supporter of the idea because of its extraordinary competencies in all aspects of satellite navigation signals, such as simulation and modelling of signal propagation. In addition, its provision of Galileo data for scientific experiments is fundamental to further efforts to improve VADASE's algorithms, develop integrated firmware and, of course, test it under realistic conditions.

The Experts

Dr Rolf-Dieter Fischer
Head of Technology Marketing
German Aerospace Center (DLR)

Dr Dennis Göge
Executive Board Representative
German Aerospace Center (DLR)

Robert Klarner
Technology Marketing
Branch Office Oberpfaffenhofen
German Aerospace Center (DLR)

Dr Michael Meurer
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German Aerospace Center (DLR)

Walter Päffgen
Managing Director
DLR Gesellschaft für
Raumfahrtanwendungen mbH

Dr Klaus-Dieter Rockwitz
Program Directorate Space
German Aerospace Center (DLR)

Dr Ulrich Theis
Head Navigation
DLR Space Agency

About DLR

The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt, DLR) is Germany´s national research centre for aeronautics and space. Its extensive research and development work in aeronautics, space, transportation and energy is integrated into national and international cooperative ventures. As Germany's space agency, DLR has been tasked with planning and implementing the German space programme by the German federal government, as well as with representing Germany's interests internationally. Approximately 6700 people work for DLR; the center has 33 institutes and facilities at 13 locations in Germany. In determining the focal points of its research, DLR is to a large extent guided by the industry's demand for innovative products and services. In addition, it invests in promising technologies and offers its research and development capacities to customers for their own use. Numerous products have been successfully developed in this way and brought to market in cooperation with innovative enterprises. **www.dlr.de**

DLR

WINNER OF THE SPECIAL TOPIC PRIZE
NAVTEQ

The Winners
**Marc van Gent | Martin Koel |
Tudor Cobalas | Bastiaan Walenkamp**

The Idea
**Parking Dialogue – The Mobile
Application for Carefree Parking**

The Prize NAVTEQ

NAVTEQ digital map data is fuelling a new era of innovative thinking and inventions and sparking the development of precise, reliable navigation products and services. NAVTEQ is the means of developing a virtually limitless range of location-based services (LBS) – services that will connect people for lunch, for meetings, for life. NAVTEQ was looking for developers to submit innovative location-based ideas that work with mobile phones and/or wireless handheld devices using satellite positioning technology and NAVTEQ map data.

NAVTEQ™

DESCRIPTION

Park your car, take your smartphone, start the application, and stop it when you drive away. Forget about finding and filling the parking meter. This is the future of car parking.

Although paid parking has advanced in technology, the existing solutions are not optimised. Finding a parking code and sending complex text messages is time-consuming, difficult, and frustrating. Using the combination of positioning technology and smartphone devices solves these problems.

Users of current services have to send a text message with their license plate, a keyword, and a parking zone code to a dedicated parking provider. Each city has a different provider, which presents another problem. The parking code is usually displayed on the parking meter, which can be difficult to find. The same exhausting procedure is necessary when leaving the parking area.

This new technology, Parking Dialogue, uses location coordinates to identify the parking area and the details related to it. Moreover, all parking providers are available in the application. A simple click is all that is necessary to start and end a parking session.
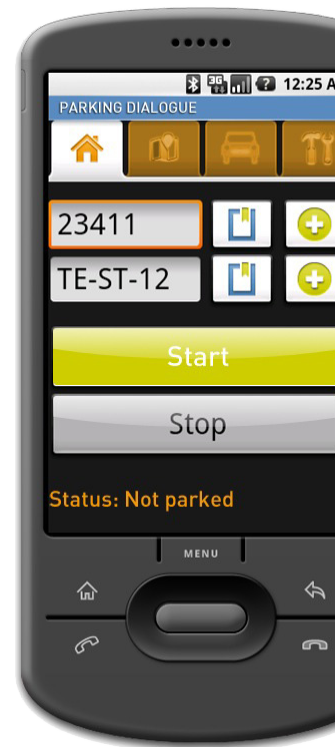
INNOVATION

The innovation of Parking Dialogue comes from the combination of parking system technology and the features of smartphones, including positioning, SMS, and Internet functions. This results in a comfortable solution that saves time in day-to-day activities. It's complex technology made simple and easy for the user. Parking Dialogue could also inspire other applications, such as a tool able to combine data from ENVISAT satellites in order to help users avoid polluted and busy areas of a city.

TARGET MARKET

Any smartphone user who has a car and lives in a busy city is a potential customer. In 2008, the value of the parking market in Amsterdam was around €140 million, of which parking via mobile phone accounted for €26.5 million. Drawing a parallel to the growing figures of the smartphone market, we are targeting the parking markets of large European and North American cities. The ineffective method used nowadays, where users have to send a unique SMS after finding the number of the parking area and another message to close the parking session, is easily managed by the innovative Parking Dialogue solution.
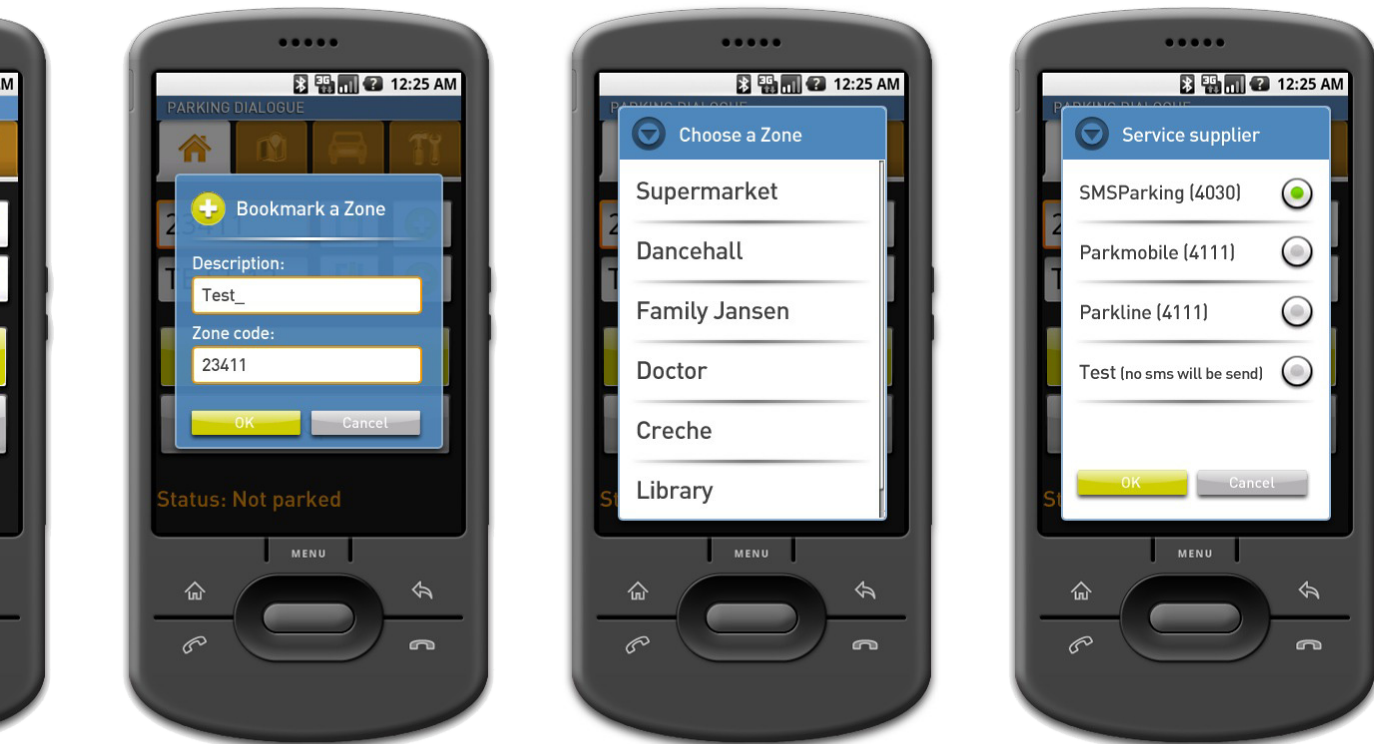
CUSTOMER BENEFIT

This service provides an integrated solution to a highly difficult, time-con-suming problem that can otherwise cause considerable frustration. Looking forward, we can achieve integration with other data sources, applications, and functionalities. Our customers will benefit from a mobile application that supports the applicability and functionality of daily activities.

Dialogues Technology
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www.dialoguestechnology.nl

The Decision

What was the convincing feature of Parking Dialogue's business model and how does it benefit from NAVTEQ map data?

The convincing feature of the application was its' precision from the use of the Galileo satellite and NAVTEQ Maps, they allowed for pinpoint accuracy. It also gives the user parking freedom, the ability to save time and money.

- You will know if a garage is full or not before you arrive so you don't have to waste time driving around.
- The convenience of paying a month bill instead of having to carry cash or a credit card and wait in line to pay
- The convenience of parking in a garage instead of on the street and risk getting a ticket

What will be the next steps to nurture this idea into a running LBS application?

Complete testing on the application, update the prototype and present the working solution to all viable partners and assist with a strategic marketing campaign.

Which enhancements and additional features would you expect in the future?

The integration of local advertising, and making this application even more desirable as a parking experience for the user.

The Experts

Marc Naddell
Vice President Partner and
Developer Programs
NAVTEQ

Steven Si
Technical Consulting Manager
NAVTEQ

Tom Tierney
Partnering Manager
NAVTEQ

About **NAVTEQ and NAVTEQ Network for Developers™ (NN4D)**

NAVTEQ is the leading global provider of digital map, traffic and location data that enables navigation and location-based platforms around the world. The Chicago-based company was founded in 1985 and has approximately 4,400 employees located in 192 offices and in 43 countries. NAVTEQ Network for Developers™ (NN4D) is a dynamic web portal and global community that provides developers and business partners with the technical and business support needed to build, showcase and launch the most innovative location-enabled solutions. The NN4D includes resources such as mapping APIs, LBS content, point of interest data, routing information as well as geospatial platforms and tools from NAVTEQ and its partners. Members can rely on NN4D when creating GPS-based applications for the web, mobile phones, GIS and portable navigation devices that employ traffic, navigation, location content and location-based advertising for enterprise and consumer use. Connect with the people, tools and resources you need to build and market your location-enabled products by joining today at: **www.NN4D.com/joindevelopers**

The Winners

**Wolfgang Inninger | Gerd Waizmann |
Agnes Eiband | Carl Behmer**

The Idea

**DAGObert: DAngerous GOods Coordination
Through Location-Based Road Traffic
Management**

The Prize **Safety and Security**

Forum SatNav MIT BW believes in the enormous economic potential satellite navigation presents, especially for Baden-Württemberg. The forum focuses on the development of applications and services based on navigation, information, and communication technologies. In particularly, it seeks to support small and medium-sized companies in launching innovative products and services, as well as in the creation of strategic alliances, cooperations, and partnerships. For the special topic prize on safety and security the forum was looking for submissions that involve an innovative solution from the areas of satellite navigation and mobile IT and be market-ready and oriented along the value chain.

DESCRIPTION

Strict rules regulate the storage and transport of hazardous materials in Europe. Substances that could cause dangerous reactions must not be stored close together. At motorway bottlenecks such as tunnels, road works, and parking areas, however, hazardous goods transports pass each other at a distance of only a few metres. An accident could have disastrous consequences.

The purpose of DAGObert is to prevent vehicles transporting reactive hazardous materials from meeting at such bottlenecks. The system includes mobile devices and a location-based (GNSS) message system for lorry drivers, as well as GSM-based communications. The aim is to locate, identify, and stop lorries carrying hazardous materials in case of a potentially dangerous situation.

The Fraunhofer institute for material flow and logistics has developed a prototype in collaboration with proTime GmbH and LKZ Prien GmbH. Having been demonstrated successfully in 2009, it serves the basis of subsequent and ongoing research projects.

Photo: Satellite based software for safer hazardous goods transports –DAGObert. © Dave Bolton / iStockphoto

INNOVATION

DAGObert uses GNSS geofences to define sensitive route sections. Hazardous goods lorries are automatically located and identified upon entering these sections. The system then transmits a location-based directive to the driver. The solution is in line with the needs of the transport industry regarding data security. Additionally, DAGObert's high level of automation means only minimal manpower is required at the system's management centre.

Currently, the system operates with GPS signals, but the implementation of GALILEO – especially the "Commercial Service" – will allow for more accurate location and higher reliability.

TARGET MARKET

The first step of our commercial launch will be a field test in a representative region with several lorry companies dealing with hazardous goods. Any conventional smartphone could potentially be an applicable user device, but in practical use, the integration of the system into lorries' existing on-board units would be the solution with the highest market potential. Our future goal is to establish DAGObert on the mass market and equip every lorry that transports hazardous goods across Europe with the system.

CUSTOMER BENEFIT

Hazardous goods lorries that use DAGObert can be localised and identified upon entering a potentially dangerous area. This offers several benefits: Dangerous accidents can be avoided, risks of terrorist attacks using hazardous goods lorries can be reduced, lorries can be protected from theft, and rescue teams can be informed of the hazardous materials being transported in their respective areas of responsibility. In general, DAGObert reduces transport risks that could cause lower insurance contributions, which would be part of the financing model.

Fraunhofer-Institute for Material Flow and Logistics (IML), Mr Wolfgang Inninger
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www.prien.iml.fhg.de

proTime Gesellschaft für Informationslogistik GmbH, Mr Gerd Waizmann
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www.protime.de

The Decision

DAGObert perfectly meets your call for a safety-critical application that combines satellite navigation and mobile IT. What was the main deciding factor in your choice?

DAGObert is a well-engineered, mature, and professionally developed competition entry. The jury was impressed by the capability of the application, which will decisively improve road safety. We expect this award and the support it provides to help advance the marketability of DAGObert.

The secure transport of dangerous goods is an important issue. Do you think DAGObert will reach a sufficient level of penetration to address this problem over a wide area?

Yes, we do. The DAGObert project is a part of the European traffic project EasyWay, which will be crucial for the transition of this technology from field testing to use in a real-world product. For this reason, we are confident that DAGObert will be successful.

The Experts

Dr Rolf-Jürgen Ahlers
Managing Director ASG Luftfahrt-
technik und Sensorik GmbH & Di-
rector Forum Luft- und Raumfahrt BW

Dieter Geiger
VP Business Development Traffic
Solutions, Siemens AG

Stefan Hellfeld
Research Associate
FZI Forschungszentrum Informatik

Ralph Zimmermann
Deputy Head of Division for Telecom-
munication, Media and Knowledge
Society, Ministry of Economics BW

About Forum SatNAV MIT BW

Forum SatNav MIT BW is a consortium of companies, research institutes,
chambers, and economic development organisations from the Baden-Würt-
temberg cluster for applied satellite navigation and mobile IT. It is estab-
lishing these two fields in the state, making them accessible to a broad en-
trepreneurial and scientific spectrum, and promoting the economic use of the
technologies involved. Through pilot projects and innovative applications, Fo-
rum SatNav MIT BW seeks to intensify cooperation and encourage its mem-
bers to share their experiences. **www.galileo-bw.de**

The Winners

**Stef Kolman | Selene Kolman |
Tomas van der Wansem | Bernard Veltien**

The Idea

Real-World Vehicle Emission Profiles

The Finalists

The Prize GNSS Living Lab Prize - Energy

Living Labs are User Driven Open Innovation Platforms. Stakeholders, including firms, public agencies, universities, institutes and users are all collaborating for creating, prototyping, and validating new service-products and societal infrastructures in real-life contexts in a Public-Private-People-Partnership (PPPP). The GNSS Living Lab Prize called for proposals for GNSS-related products and services ready to be tested and ideally implemented in a suitable Living Lab.

Applications to be submitted for the ENERGY theme should address prevention, preparedness and response to climate-induced incidents concerning both urban and rural settings with solutions e.g. for:

• environment and energy efficiency

• prevention, alert and rescue regarding climate change

• mobility efficiency

• efficient lighting
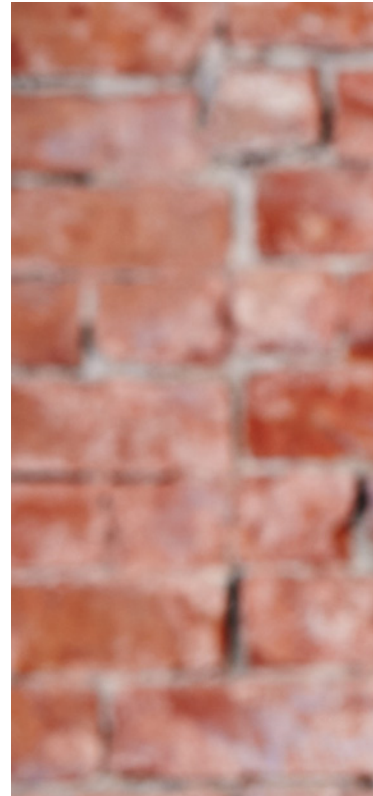
DESCRIPTION

In Europe today, our passenger cars are the cause of 12% of man-made CO_2, the main form of greenhouse gas pollution. A total of 230 million vehicles produce an average of 155 grammes of CO_2 per kilometre (2009). Recent legislation (Kyoto, Copenhagen) will require this number to decrease to 95 gCO_2/km by 2020. While new fuel-consumption and emission data is sourced from manufacturers' own CO_2 figures and checked with type-approval data from the Vehicle Certification Agency before car energy labels are applied and cars enter the market, real-world CO_2 emission data is currently not available.

Vehicle Emission Profiles use OpenCarData technology to generate real-world carbon emission profiles for passenger vehicles and compares them with European Union legislation on car energy labelling (Directive 1999/94/EC). It provides a management tool with which drivers, fleet owners, and governments can share, compare, and change vehicle CO_2 emissions.
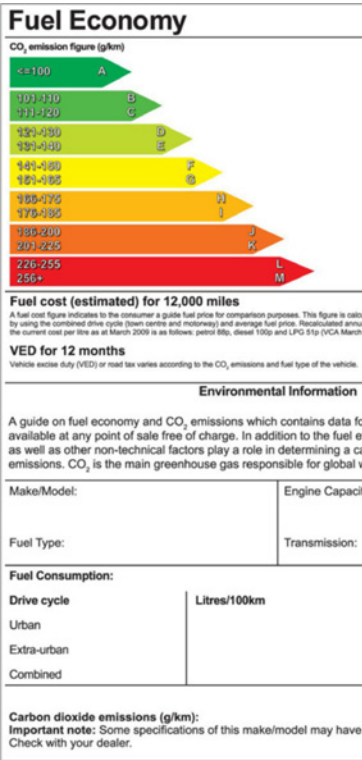
Drawing: The EU Car Energy Label (left) versus the Emission Profile from the same car

INNOVATION

On-Board Diagnostics (OBD) is a universal car computer system built into vehicles from 1996 onwards to monitor the emission performance of car engines. Although OBD has been around for many years, it has not been used to network our cars or to aggregate our vehicles' (emission) performance data. OpenCarData taps into vehicles' OBD-II information, transmits it in real time to an open-source system, and stores it in a publicly available database. The system thus performs real-time "check-ups" on individual cars or entire fleets. We provide software and an API to enable custom OBD-II applications and management tools.

TARGET MARKET

Road user charging (based on absolute emission values) will be charged by the grammes of CO_2 per kilometre generated by each individual car ("charge by emission") instead of by kilometres ("charge by distance"). Vehicle Emission Profiles provide a new entry point for road user charging by calculating actual emission volumes and visualising their locations. They also give car-leasing companies the opportunity to enrich their IT software suites with new tools to manage vehicle emissions and save costs.

Date/Time	From/To	Distance (km)	MIL	Usage (l)	Milage (km/l)	Emission (gCO2/km)	Label
6/19/10 8:47PM	Lemelerveld - Dieze	44	0	5.4	14.4	156	C

CUSTOMER BENEFIT

Companies and individuals may save up to €450 per car every year on fuel savings and emission charges.* Meanwhile, EU governments could potentially cut back 115 billion kilogrammes of CO_2 emissions from their annual quotas – a combined EU ETS valuation of €5.2 billion.**

* Based on a 20% reduction | 25,000 kilometres per year/per car | €1.50/ltr gas price
** Based on a 20% reduction | 25,000 kilometres per year/per car | €45 per ton CO_2 price

Opencardata
Share. Compare. Change!

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e-mail: info@opencardata.com
http://opencardata.com, http://opencardata.com/emissionprofiles

The Winners

Dr Volker Tank | Johannes Tank

The Idea

Cardiac Power Monitoring (CPM)

The Finalists

The Prize GNSS Living Lab Prize – Health

Living Labs are User Driven Open Innovation Platforms. Stakeholders, including firms, public agencies, universities, institutes and users are all collaborating for creating, prototyping, and validating new service-products and societal infrastructures in real-life contexts in a Public-Private-People-Partnership (PPPP). The GNSS Living Lab Prize called for proposals for GNSS-related products and services ready to be tested and ideally implemented in a suitable Living Lab.

Submissions to the HEALTH theme shall provide highly innovative services and integrated solutions with the aim of a triple win: unlocking the huge business opportunities in Europe and in the global market, containing the costs for society, and improving the quality of life (including good health) in general and in particular for the elderly and disabled.

DESCRIPTION

Self-determined physical activity at every age is one of the primary keys to achieving and maintaining overall physical and mental health. It minimises cardiovascular risk, which in spite of the highest standards of medicine is the main cause of mortality in industrial societies. Exercise also reduces the need for medical intervention and treatment, which has been a constantly increasing financial burden on industrial societies. Endurance training increases cardiac power, a lack of it causes the heart to decline. Cardiac power can thus serve as a measure of health. Cardiac Power Monitoring (CPM) enables users to determine their cardiac power development during any kind of endurance training that involves travelling some distance, such as walking, biking, skating, or cross-country skiing. Based on high-accuracy position measurement during motion, CPM derives cardiac power by combining the physical exertion the user performs with his or her interrelated heart rate. High position accuracy is achieved through utilisation of EGNOS, while SISNeT can provide reliability in urban environments.

Photo: CPM in use,
heart rate monitor and
GNSS of mobile phone.
© J. Tank

INNOVATION

To date, endurance training has been guided by medical recommendations specifying how and at which heart rate to exercise, with heart rate monitors used for training control. Until now, there has been neither a means of monitoring training success, nor targets to achieve. CPM monitors real, quantitative cardiac power during training or other physical load. The system also enables users to establish a cardiac power index (CPI) as their desired status. CPI is the target, CPM the control system.

TARGET MARKET

CPM focuses on the growing number of people of all ages who are conscientious about health, quality of life, and the environment. This includes the elderly, who face higher cardiovascular risks but also want independent lifestyles; and people undergoing rehabilitation after a medical procedure. In particular, the primary market for CPM correlates with that of heart rate monitors (one million units were sold in Germany in 2007). Meanwhile, integrating CPM with mobile phones would open up an additional market.

CP Calculation in Progress

CUSTOMER BENEFIT

CPM measures cardiac power during training at any time and location. In combination with CPI, it provides the user with a target and proof that her/his training efforts are paying off. CPM also serves as an accurate guide to adjusting and optimising training intensity. During rehabilitation, it can provide attending physicians with unique, continuous data on heart power development. Finally, it can provide a heart status history over users' entire lives.

KREATIVE TECHNOLOGIE LWU
UG HAFTUNGSBESCHRÄNKT

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WINNER OF THE SPECIAL TOPIC PRIZE
GNSS LIVING LAB PRIZE :: MEDIA

The Winners

**Dylan Seychell | Dr Alexiei Dingli |
Tunde Kallai**

The Idea

**DINOS for Smart Cities – Digital Information,
Navigation, and Orientation System**

The Finalists

The Prize **GNSS Living Lab Prize - Media**

Living Labs are User Driven Open Innovation Platforms. Stakeholders, including firms, public agencies, universities, institutes and users are all collaborating for creating, prototyping, and validating new service-products and societal infrastructures in real-life contexts in a Public-Private-People-Partnership (PPPP). The GNSS Living Lab Prize called for proposals for GNSS-related products and services ready to be tested and ideally implemented in a suitable Living Lab.

New telecommunication networks as 3G+, 4G, Wimax, FTTx and new devices as smartphones, and netbooks generate new types of consumer behaviour in the media industry. Submissions to the MEDIA theme shall complement the offer generated by the above mentioned technologies and provide citizens and people with added value services various sectors.

DESCRIPTION

DINOS for Smart Cities will be a hybrid system that collects and manages information and aids users travelling in cities by making use of localisation services. It will incorporate an intelligent information system that automatically manages the status of the queues at tourist attractions, thus distributing visitors among different places of interest. The system will also be able to determine which queue is moving most quickly. Using artificial intelligence (AI) techniques, DINOS will in return suggest attractions to users depending on this status and provide recommendations based on their proximity to relevant locations. Natural language processing (NLP) will be employed to protect tourists by reducing their use of the traditional methods , making them less vulnerable to theft. The system will comprise a central server that receives information from nodes at places of interest and interacts with users on their mobile devices.

Co

E

Photo: Conceptual
drawing showing the
DINOS benefit group
and stakeholders

INNOVATION

DINOS is an automated guide that requires minimal user intervention. It provides the user with navigational and orientation support and up-to-date information when travelling in cities. DINOS constantly monitors the user's location, recommending attractions and places of interest nearby according to their relevance. Users can also take advantage of the orientation tools provided, which include an interactive map and augmented reality functions. DINOS makes use of GPS for external localisation, and its application was developed on the Android mobile technology platform.

TARGET MARKET

Tourism: The system enables users to obtain information about the attractions in cities and general orientation based on a combination of digital maps/guidebooks.

Marketing: The commercial community and historical attractions will use DINOS to promote their products and services while collaborating together to improve users' experiences in cities where the system is implemented.

Learning/Gaming: One could also use the system to conduct fun learning experiences around cities, such as scavenger hunts.

Telecoms
Companies

Advertising
Companies

Commercial
Entities

Historic
Attractions

End Users

Equipment
Vendors

CUSTOMER BENEFIT

The end user benefits from continuous adaptive guidance and navigational assistance while receiving high-quality, relevant information. Meanwhile, DINOS also represents new marketing and advertising space commercial and historic entities can access. In addition, it holds potential advantages for marketing agencies, which could use DINOS to conduct highly segmented and dedicated campaigns. In a nutshell, the potential users of DINOS are all of the entities related in any way to a given city. Another advantage is that DINOS builds a profile of the user and processes information in a way that guides consumers to the companies supporting the application.

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First Wave Living Labs
Second Wave Living Labs
Third Wave Living Labs
Fourth Wave Living Labs
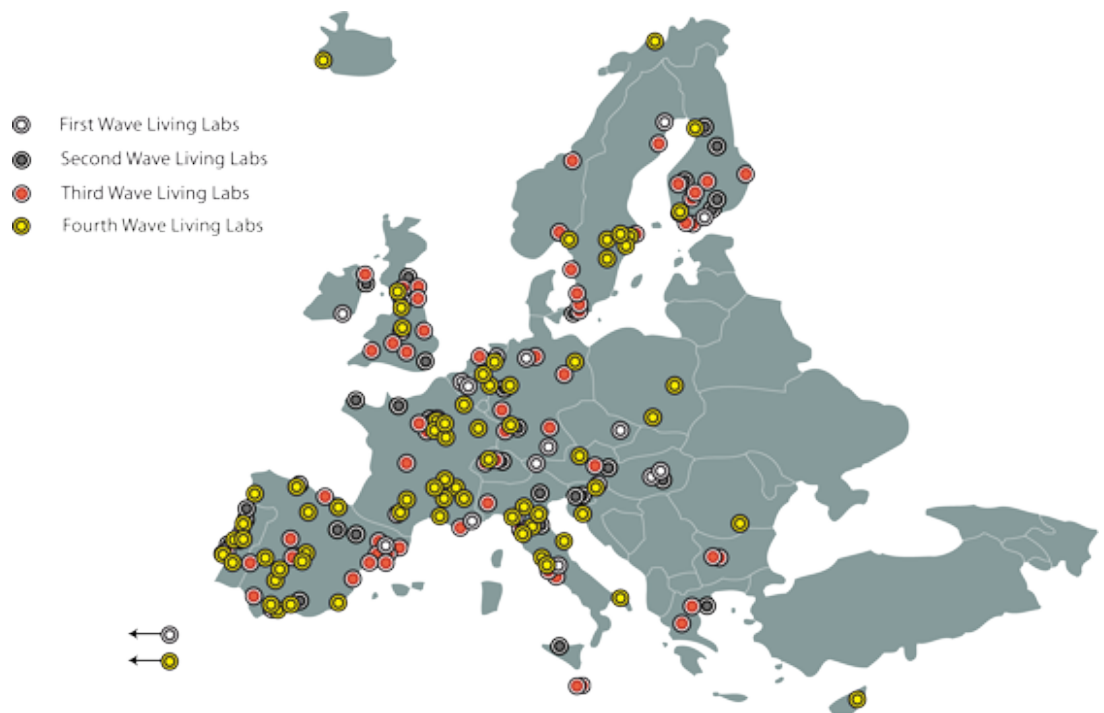
The Decision

ENERGY | **Thinking from a user's perspective, how do you expect displaying vehicle emissions in real time to change driver behaviour?**

By accessing an open, real-world display of their CO_2 emissions, users become aware of their behaviour in their everyday commuting and globally conscious of how they can personally contribute effectively to reduce pollution and energy consumption. Users can compare their improvements with others, set measurable targets, and play competitive games. This type of activity has been proven to motivate behavioural change – in home energy savings, for example.

HEALTH | **What makes CPM stand out among existing GNSS-based heart-rate monitoring solutions? Will CPM be more motivating?**

By introducing a novel and clever measure of cardiac power, this solution provides users with an attractive and emotional target for evaluating the success of their personal training. The success of their training is not judged by how fast they can run or swim, or how much cycling or mountain hiking they can endure, but by how many beats their hearts need for a given physical activity.

MEDIA | **DINOS cleverly combines touristic information with location-based advertising. How will you evaluate the commercial success of this business model, and what added value does it provide to the user?**

Users are going to experience something new in having a powerful personalised service that provides information on the best leisure activities available at their current locations. Meanwhile, small businesses will have the chance to attract more customers in their vicinity and will help create a new market for localised advertisement.

The Experts

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Vice President
European Network of Living Lab

Prof Dr Pieter Ballon
General Manager
IBBT-iLab.o

Dr Klaus Enßlin
Managing Director
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Boris Kennes
R&D and Market Monitoring Officer
European GNSS Supervisory
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Veli-Pekka Niitamo
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PROCESS VISION OY

Jean-Yves Roger
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European Commission

Dr Carsten Rudolph
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Munich Business Plan Competition

Artur Serra
Deputy Director
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Claudio Vandi
Project Manager and Researcher
LUTIN Userlab

About **European Network of Living Labs (EnOLL)**

ENoLL is both an open community and a legal non-profit association and was launched in November 2006 by the EU Finnish Presidency and supported by the subsequent ones. The network offers open innovation methodologies and techniques in the product development life cycle. A Living Lab is an open innovation environment in which user-driven innovation is supported by the availability of established, consolidated services and ICT infrastructure for creating, prototyping and using new products and services in real-life environments. There are 220 operational Living Labs in different domains, spanning from eHealth to energy optimisation and efficiency, and from intelligent mobility to inclusion of the elderly and disadvantaged people.

European
Network of
Living Labs

About **Galileo Advanced INnovation Services (GAINS)**

The objective of the GAINS project is the implementation of an ʻinnovation highwayʼ as a seamless process of coordinated Galileo downstream application innovation services on a European scale. The intention is to support a project from the inception of the idea to business growth in three main phases: idea recognition, product and services development, and new venture creation. The integration of ESNC and ENoLL will provide a great step forward in closing the gap between idea generation and application development, by providing access to product development and facilitating the set-up of ʻreality checkʼ pilots in a real-life setting for products and services under development.

GAINS
GALILEO ADVANCED INNOVATION SERVICES

SEVENTH FRAMEWORK
PROGRAMME

WINNER OF THE SPECIAL TOPIC PRIZE
UNIVERSITY CHALLENGE

The Winner
Vivek Dadu

The Idea
Flood Guardian

The Prize **University Challenge**

High quality GNSS education is a driver for innovation, an enhancement for companies' competitiveness and a valuable opportunity for international cooperation. To bridge the gap from GNSS research and academia to entrepreneurship the ESNC University Challenge not only addressed students and research associates with a background in aerospace and GNSS-specific courses of study but aimed at reaching out to any young researcher dealing with areas of potential applications, be it prospective automotive engineers, logistics providers, game and other mobile application developers, or health promoters. Submissions should focus on creativity and market needs rather than technological perfection of the business idea.

ESNC 2010
University Challenge

EUROPE
INNOVA
Innovation in Services
KIS4SAT

DESCRIPTION

Even with the many technological advancements available today, it is impossible to completely control natural calamities like floods, tsunamis, earthquakes, and storms. Of these disasters, UNESCO reports that flooding is most common. Since 1998, the European Commission has recorded around 700 deaths caused by floods across Europe, along with about half a million displaced people and at least €25 billion in insured damage (to say nothing of uninsured costs).

In light of the devastating effects of flooding, there exists a need to effectively generate advance warnings and provide cogent solutions to avert potential floods. Flood Guardian acts as a single-point solution that makes use of satellite navigation (GNSS) to perform these tasks in real time. When placed in cluster configurations at different locations, these devices can be used to collectively monitor a large area of land.

INNOVATION

Flood Guardian uses attitudinal information to continuously monitor the rate of change of water levels, which makes it possible to generate advance flood warnings in real time. In addition, the instrument uses standard positioning information to identify its present position. If deployed throughout a country, this equipment will collectively determine the current status of various water channels in real time. A database of this information prepared on a day-to-day basis can be used to project potentially problematic areas. Once a clear projection is obtained, the system will be able to provide suggestions on the best way to divert water and avert possible flooding.

TARGET MARKET

The European Commission has directed each of its member-states to assess and reduce the risk of flooding. In addition, the UK government has earmarked £2.15 billion until 2011 for the creation of a flood defence system in the country. The Flood Guardian concept proposed here is in line with the Commission's future plans/directives.

Flood Guardian's potential customers include:

- Water management companies
- Local and regional water management authorities
- Hydro-meteorological departments and research labs
- The agriculture sector

CUSTOMER BENEFIT

Flood Guardian serves many purposes on the humanitarian front. Its real-time field monitoring imparts better situational awareness, especially in providing advance warnings to people living in flood-prone areas. This can also be used in precision agriculture to automate irrigation activities.

Cranfield UNIVERSITY

HAL

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The Decision

From a research perspective, what makes the technical approach stand out?

In order to obtain the expected system performance, several technical issues have to be carefully addressed. The proposed solution combines code and carrier measurements, introduces a system architecture to mitigate errors, and considers both position accuracy and other important aspects – complexity and fast initialisation, for instance, which are key in developing an effective application.

From a business incubation perspective, what are the next steps towards the commercial implementation of the application?

The aim of the ESNC University Challenge is to realise the winning idea by founding a start-up company. The KIS4SAT consortium will thus provide 10 days of work with an individual coach who will, for example, provide consulting on IPR issues, technological feasibility, and the business plan in order to prepare the application for one of the suitable incubation programmes offered by the ESNC partner regions.

From a patent consultant's perspective, how do you evaluate the likelihood of obtaining a patent for the solution?

If the presented idea solves a problem using a technical solution in a novel, non-obvious way, it is patentable according to patent legislation. The possibility to obtain a patent is thus dependent on whether similar or corresponding solutions are already publically known. As such, the solution should have very good chances to be granted a patent if it is found to be new.

The Experts

Stefano Scarda
Policy Officer
European Commission

Michel Bosco
Deputy Head of Unit
European Commission

Fabio Dovis
Assistant professor
Politecnico di Torino

Dr Daniel Ludwig
Senior Consultant
DLC-Grand Toulouse-France

Gustaf Särner
Patent Attorney
Awapatent AB

About **The University Challenge**

High quality GNSS education is a driver for innovation, an enhancement for companies' competitiveness and a valuable opportunity for international co-operation. To bridge the gap from GNSS research and academia to entrepreneurship the first ESNC University Challenge particularly addressed students and research associates with the aim to foster the creation of commercial ventures from bright ideas. The ESNC University Challenge has been carried out by Anwendungszentrum GmbH Oberpfaffenhofen (AZO) and supported by the CIP project KIS4SAT (Knowledge Intensive Services in the satellite downstream applications and services sector), Awapatent AB and the University of the Federal Armed Forces Munich.

ESNC 2010
University Challenge
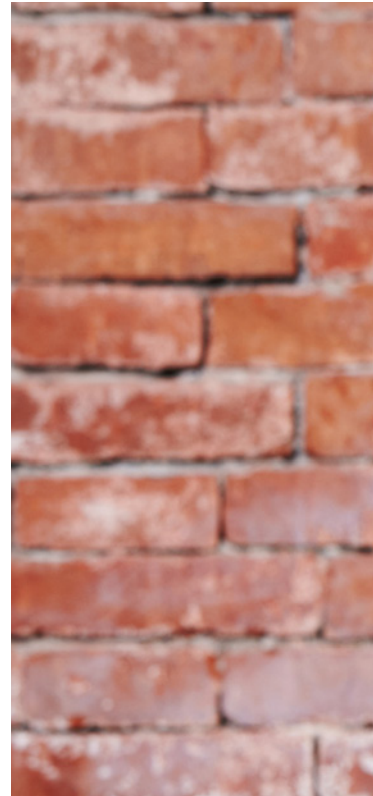
EUROPE
INNOVA
Innovation in Services
KIS4SAT

REGIONAL WINNER
AQUITAINE / FRANCE

The Finalists

The Winners

Bruno Desruelle | Philippe Bouyer | Arnaud Landragin

The Idea

µQuanS – A Portable Matter-Wave Gravimeter

DESCRIPTION

Our idea involves developing a high-performance absolute gravimeter dedicated to various geophysics applications. This instrument will be capable of measuring vertical acceleration with a relative accuracy close to 10^{-9}. Gravimetric surveying/monitoring is already a well-established technique for different purposes related to underground analysis. The presence of heterogeneity in the ground does indeed lead to gravimetric anomalies that can be detected by a high-sensitivity instrument. These sensors are therefore considered very powerful tools for subsurface "imaging". Their utilisation in monitoring volcanoes is an interesting application example, and they offer high potential in detecting advance signals of seismic activity. Other applications are also possible in hydrology, seismic surveillance, and the monitoring of oil and gas production sites.

Photo: Gravimetric measurement campagne performed by a team of Géosciences, Montpellier in Iran.
© Nicolas Le Moigne, CNRS

INNOVATION

This project is based on a highly innovative technology. Our gravimeter is based on atom cooling and trapping, as well as on quantum manipulation techniques using lasers. The principle relies on the measurement of the acceleration experienced by rubidium atoms initially trapped and cooled at a temperature of a few µK in a vacuum chamber. This sensor technology is protected by a recent international patent. In addition, the gravimeter performance will require the used of advanced GNSS techniques because the absolute vertical position of the sensor must be determined within few millimetres anywhere on earth.

TARGET MARKET

Our product addresses the global market for applied geophysics. In the short term, we expect to develop some activity with companies specialised in the management and exploration of underground resources. Our solutions will also be of crucial interest to members of the academic community who are conducting research activities in the field of gravimetry and looking for new application schemes. Over the longer term, we think our approach – the first compatible with permanent monitoring – will give rise to the emergence of gravimetric earth surveillance networks, which will considerably improve our capability to predict seismic activity and volcanic eruptions.

CUSTOMER BENEFIT

Utilisation of laser-cooled atoms is a disruptive technology in the field of gravimetry and will offer future customers interesting benefits compared to state-of-the-art technology. In particular, our gravimeter will offer the possibility of performing absolute measurement with extreme accuracy (close to 10^{-9}). Another interesting feature is our innovation's unlimited acquisition time at a high repetition rate (a few Hz). Eventually, we expect a significant gain in weight and compacity compared to current absolute gravimeters.
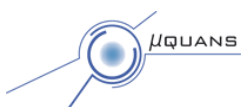
µQuanS
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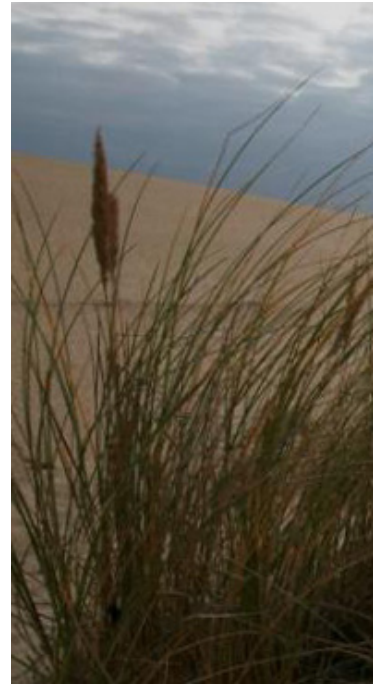e-mail: bruno.desruelle@microquans.com

Photo: Beach on the edge of the basin of Arcachon at sunset
© Gilbert Alban

The Region Aquitaine

Located in southwest France, the Aquitaine region is bordered by the Atlantic Ocean and the Pyrenees. Aquitaine offers a mix of economic dynamism, fascinating landscapes, and cultural heritage that contributes to the success of entrepreneurial ideas and defines a unique perspective of welfare and personal development.

The region is positioned at the heart of current European issues and aims to ensure economic growth and sustainable development throughout the European territory. In Aquitaine, the emphasis has been placed on numerous projects both local and cross-regional in dimension.

A leading region in aerospace with 40,000 jobs and 740 organisations in the sector, Aquitaine co-hosts the Aerospace Valley cluster and is home to major industrial groups, research institutes, and world-renowned experts engaged in satellite navigation and positioning systems. Aquitaine promotes start-ups and their innovations in the aerospace, composites, and photonics sectors.

The regional organiser TOPOS

TOPOS is a non-profit organisation that facilitates partnerships and fosters networking and collaborative activities to further develop regional ventures and activity in the downstream GNSS market.

Created in 2007 in order to increase the competitiveness of the Aquitaine enterprises centred on navigation and positioning applications, TOPOS represents about 40 industrial members, academic research centres, and institutions focused on the emergence, economic growth, and success of EGNOS / GALILEO EU projects.

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REGIONAL WINNER
ARAB MIDDLE EAST & NORTH AFRICA (MENA)

The Finalists

The Winner
Mamadou Diop

The Idea
**mLearning4Africa & Middle East –
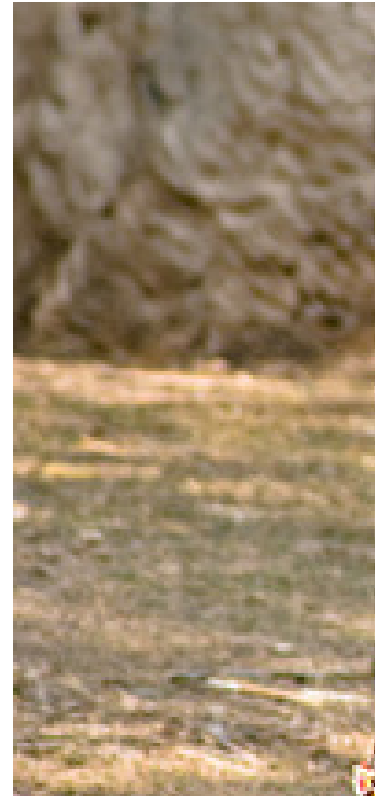Eastern Communities in Urban and Remote Areas**

DESCRIPTION

mLearning4Africa is an innovative open platform that is modular, holistic, and easy to use. It combines GPS, mobile, and satellite communication technologies in a virtual webspace (phase 1) and a mobile handset (phase 2). The platform's virtual webspace acts as a medium between educators and mobile users, facilitating content authoring, management, and publishing through Web 2.0 technologies. In addition to this web-based platform, we have also designed a mobile application that can be deployed on mobile platforms such as iPhone and Android. Content will be compatible with these two platforms, along with others such as RIM and Symbian OS.

The proposed project provides a low-cost mobile platform that will enable reporting for nomadic population units, or "cells" – tribes or extended families, for example.

About the Company

INNOVATION

mLearning4Africa and Middle East aims to contribute to scientific and technical expertise by learning about how groups of people in remote areas use mobile devices in their everyday knowledge acquisition and problem solving. It also aims to discover user innovations and concepts relating to mobile devices through a participatory design process. Based on the scenarios developed, the technology development team behind this project has built a prototype version of mLearning4Africa & Middle East that employs three main technology platforms to achieve its goal: 1) An SMS communication interface/gateway to send and receive text messages. 2) The Asterisk Open Source PBX for audio telephony communications. 3) A media wiki server offering relevant content These technologies are used to address environmental and infrastructural challenges in providing and supporting education where conventional e-learning technologies would fail; this should lead many to reconsider the accepted developmental or evolutionary paradigms.

TARGET MARKET

The primary ability of the proposed product is to identify, locate, and coordinate mobile population groups such as nomadic tribes, herders, and displaced social groups in order to enable the implementation of educational programs, including e-learning and m-learning. The concept could reach a large number of urban, rural, and remote users between the ages of 10 and 55 (and older).

CUSTOMER BENEFIT

The main impact of the project will stem from the creation of a technology that supports existing social infrastructures and increases the potential of current practices with mobile phones by introducing opportunities for knowledge sharing, community building, and joint learning in the authentic context of studying. The application explores and comprehends the cultural, social, and organisational contexts of people in remote areas using models and scenarios of how mobile technologies could be used for teaching, learning, healthcare and user empowerment.

ISEG
INSTITUT SUPÉRIEUR
D'ENTREPRENEURSHIP
ET DE GESTION

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The Region **Arab MENA**

The population of the Arab nations is estimated at approximately 340 million across the Middle East and North Africa (MENA), which includes 23 different countries: Algeria, Bahrain, Comoros, Djibouti, Egypt, Eritrea, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen.

Though diverse in geography, resources, and ethnicity, the Arab region shares a common language – Arabic – and a common history that dates back to the rise of Islam in the 7th century AD. Islam is the predominant religion in the Arab countries; combined with their shared past, it has produced a melting pot of culture and heritage that has resulted in strong community links and a mutual interest in development throughout the Arab world. This sense of commonality was formalised by the establishment of the League of Arab States in 1945. The Arab League is a regional organisation set up to nurture and build on these common elements in order to strengthen political and economic relations among the Arab states.

MENA Region

Arab Science and Technology Foundation (ASTF)

The Arab Science and Technology Foundation (ASTF) is an independent, non-governmental, non-profit regional and international organisation. ASTF was formed in April 2000 by a group of Arab scientists and engineers from all over the world with the prime directive of promoting science and technology in the Arab Middle East-North Africa (MENA) region. ASTF serves as mediator between those who produce, develop, and fund scientific research, and those who benefit from it. In all its activities, ASTF supports and facilitates scientific and technological innovation in the Arab world. Its goal is to fulfil its mission as a pan-Arab organisation by establishing branch offices in Arab capitals and liaison nodes in other parts of the world. At present, ASTF has branch offices in Sharjah (UAE), Baghdad, Cairo, Tunis, Amman, Morocco, Libya, and Sudan. In addition, ASTF aims to identify outstanding scientific research activities and become a centre for assessing the performance of scientific programs, as well as a powerful international Arab entity that defends the region's interests in scientific and technological progress.

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The Region Australia

Queensland, Australia, covers an area of 1.7 m sq km, ranging from densely populated, well-serviced cities to sparsely populated rural areas with densities below one person per sq km. Consequently, Queensland provides opportunities for the development of GNSS applications for both remote areas and cities. GNSS technology is being used in an increasing number of sectors, including industries that underpin Queensland's strong economy. GNSS-related businesses in Queensland currently generate an estimated AUD 350 m annually in goods and services, and employ 750 people, of which 250 are in research and development. Queensland boasts 40 GNSS related businesses, with global significance in GNSS technology for the accurate guidance of machinery used in key industries such as mining, agriculture and infrastructure development, and national significance in vehicle based GNSS, for example intelligent transport systems.
www.qld.gov.au

Meet the Regional Experts

Regional Partners / Sponsors

The regional organiser IGNSS Society

The IGNSS Society is a market driven not for profit association providing services such as workshops, conferences, trade exhibitions and awards for excellence programmes. Areas of specific interest include space, air, land and marine applications. The IGNSS Society is incorporated in Queensland, Australia – a region boasting enormous growth in the quality and quantity of GNSS products and applications in the last decade. Queensland currently has: 40 GNSS related businesses, with global significance in GNSS technology for the accurate guidance of machinery used in key industries such as mining, agriculture and infrastructure development, and national significance in vehicle-based GNSS, for example intelligent transport systems.

The Australian Challenge brings a new perspective to the competition through its emphasis on GNSS solutions to deal with specific Australian concerns, such as sparsely populated areas, large scale surface mining operations, and precision agriculture requirements. **www.ignss.org**

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The Finalists

The Winner
Erich H. Franke

The Idea
**Satellite-based System for Monitoring
Animal Population to Assess Environmental
Quality Parameters**

DESCRIPTION

The quality of the environmental conditions in biotopes can be assessed by observing the interaction of animals and plants in each respective area. In typical predator-prey systems, the food chain is a solid reflection of the conditions inside of the habitat. A good example is the interaction between bats and the insects these flying mammals hunt. The size of the insect population reacts rather sensitively to pollution or poisoning in a given biotope, and, since the number of hunting bats in an area depends on the available insect prey, counting bat flights on a long-term basis provides an indication of the habitat's quality. However, counting bats is tedious a task, and human observers' results often lack reproducibility and reliability, which lowers their significance. Automated detection, position finding, classification, and counting of bats can significantly improve the quality of the derived data.

Photo: Detector with satellite communication device and control box deployed in the field. © 2010 AFUSOFT Kommunikationstechnik GmbH, Germany

INNOVATION

Derived from technology originally developed for green border surveillance, the automated system detects bats' ultrasonic "calls". It performs a triangulation using hyperbolic navigation using three sensor heads to find out if the bats are flying in or out of the area under surveillance. Geodetic position and time synchronisation are performed through the satellite navigation system, while the data collected is transmitted to a surveillance centre through satellite communication.

TARGET MARKET

The primary users will be government agencies and larger organisations responsible for environmental protection. Since these issues have become legally mandatory in Europe, authorities have to generate and publish statistics in order to prove, for example, that a new motorway or industrial area project will not have adverse effects on the environment. We anticipate higher demand in lightly populated European countries with large forests and uninhabited areas, where manpower costs are increasing.

CUSTOMER BENEFIT

Automated detection and counting will dramatically improve the reliability and reproducibility of environmental data and prevent it from being challenged if cited in a court of law. Furthermore, the cost of studies based on long-term observations will be significantly reduced due the much lower manpower requirements.

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Photo: Castle Hohen-
zollern offering a spec-
tacular view over the
Swabian Mountains.
© Manuela Weschke

**Meet the
Regional
Experts**

**Regional
Partners /
Sponsors**

The Region Baden-Württemberg

Baden-Württemberg is a federal state home to some 11 million inhabitants in southwestern Germany. It is famous for its tourist highlights, such as the Black Forest and Lake Constance; its universities in Heidelberg, Freiburg, Karlsruhe, Constance, Stuttgart, Ulm, and Tübingen; as well as the companies Daimler, Porsche, SAP, and Bosch. The state is also known for its great writers – Friedrich Schiller (William Tell) in particular – and its people are known as „Tüftler", which indicates a great enthusiasm for technical problems and their solutions. Thanks to this open-minded spirit, Baden-Württemberg is ideally positioned to participate in the European Satellite Navigation Competition. Doing so gives its citizens the chance to both take on technical challenges and establish international contacts. **www.baden-wuerttemberg.de**

The regional organiser **IHK | Forum SatNav MIT BW e.V.**

IHK Baden-Württemberg: The 12 Chambers of Commerce and Industry in Baden-Württemberg represent the interests of around 534,000 companies and provide services to the region's economy. As public legal bodies, they also regulate state duties and act as expert partners and advisors to ministries, courts, and authorities in economic matters. **www.reutlingen.ihk.de**

The goal of the Forum for Applied Satellite Navigation and Mobile IT Baden-Württemberg e.V. (Forum SatNav MIT BW) is to establish satellite navigation in the German state of Baden-Württemberg by providing companies and research institutes with efficient access to this future technology. Forum SatNav MIT BW carries out projects and events and organises topic-specific workgroups while advising the Baden-Württemberg Ministry of Economic Affairs on all issues related to satellite navigation and mobile IT within the state's Sat-Nav Initiative. **www.galileo-bw.de**

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The Winners

Patryk Jurkowski | Patrick Henkel

The Idea

Carrier Phase Receiver System with Extremely Reliable Integer Ambiguity Resolution

DESCRIPTION

GPS satellites transmit code and carrier phase signals that can be used for positioning. Low-cost receivers use only the code signal, and are thus accurate down to a few metres. Geodetic receivers, meanwhile, use the carrier phase, which offers millimetre-level accuracy. However, the carrier phase is ambiguous as the phase of the sinusoidal wave repeats every 19 cm. The resolution of these integer ambiguities is the key to millimetre-level accuracy. Currently, the ambiguity resolution requires several minutes even for the most advanced GNSS receivers. The probability of incorrect fixing varies between 10^{-4} and 1 depending on the number of visible satellites. This is far in excess of the maximum allowed failure rate for safety-of-life applications (10^{-9}).
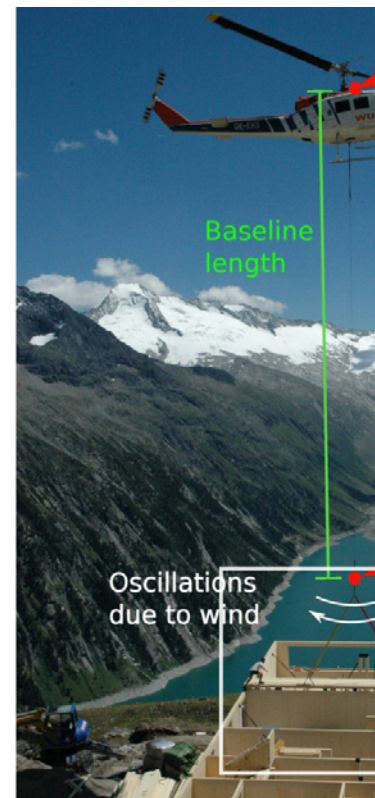
Our new receiver system achieves centimetre-level accuracy by resolving the carrier phase integer ambiguities with an error rate of less than 10^{-9}, which is several orders of magnitude lower than in any existing technique.

Photo: Secure stabilisation of freight at helicopters. © Architekten Hermann Kaufmann ZT GmbH

INNOVATION

The suggested differential receiver system substantially improves the reliability of integer ambiguity resolution through two new algorithms: First, a new multi-frequency linear combination of code and carrier phase measurements is used. It eliminates the ionospheric delay and maximises the ambiguity discrimination, which leads to a wavelength of several metres and a noise level of a few centimetres. Secondly, a priori information on baseline length is included in the ambiguity resolution, which substantially reduces the search space.

TARGET MARKET

The proposed carrier phase receiver system can be used in any application where approximate information on the distance between both receivers is available. One such scenario involves the secure stabilisation of loads carried by hovering helicopters where the length of the rope is known. This market includes the airborne supply of mountain cabin construction, as well as the daily transport of groceries. Another application is in supporting cranes that move heavy freight, such as in constructing buildings, loading container ships in large harbours, and building offshore wind farms.
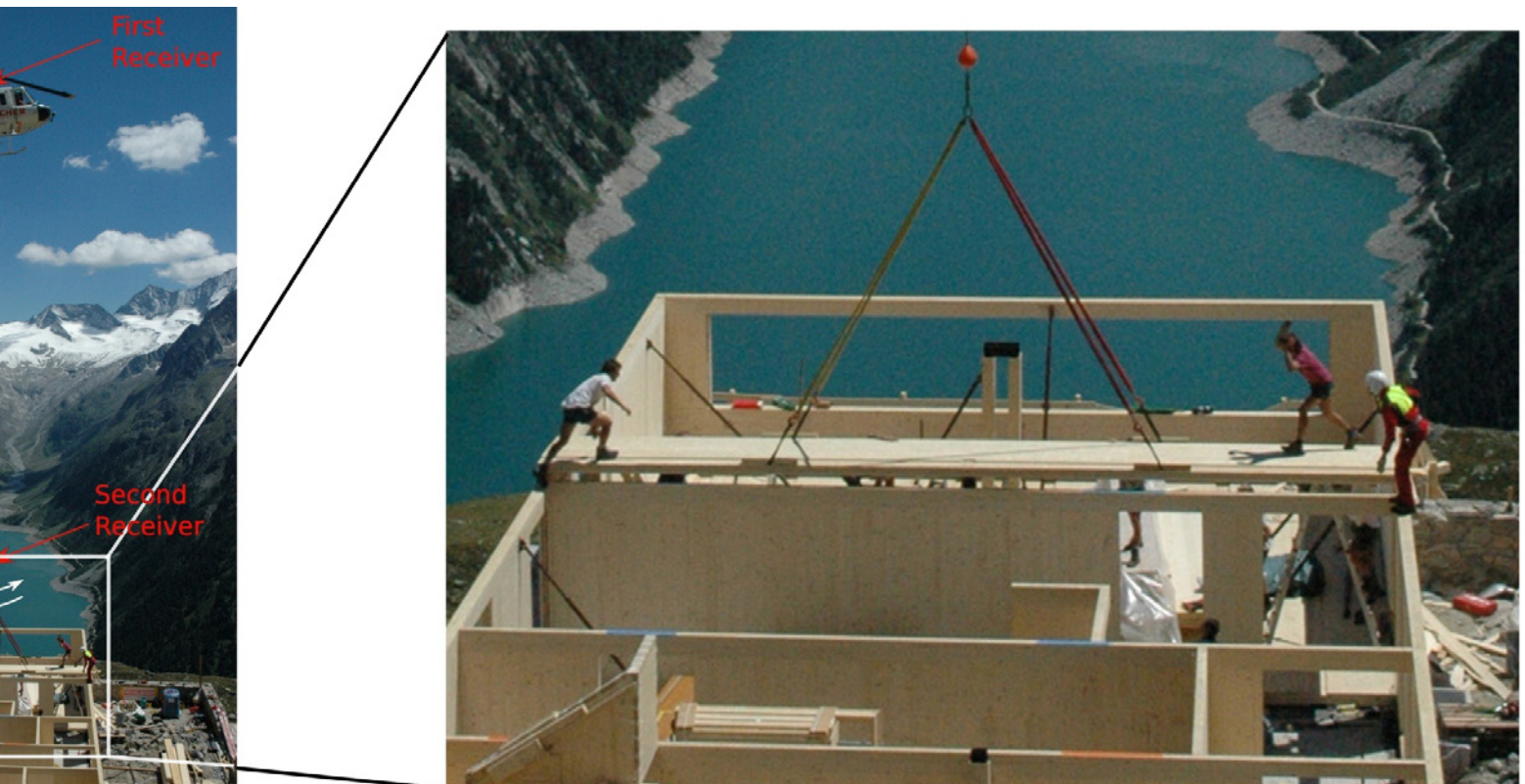
CUSTOMER BENEFIT

The stabilisation of hovering freights carried by helicopters and cranes brings two substantial benefits to the customer: First, stabilisation prevents current oscillations of the hovering load, which are a substantial risk to both ground workers and pilots, who cannot see the freight. The second benefit is that stabilising freight speeds up the unloading process, enabling a greater freight exchange in the same amount of time.

in the course of formation:

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Photo: Munich, capital city of Germany's Free State of Bavaria. City skyline in the morning light. The Alps visible in the background.
© Rudolf Sterflinger
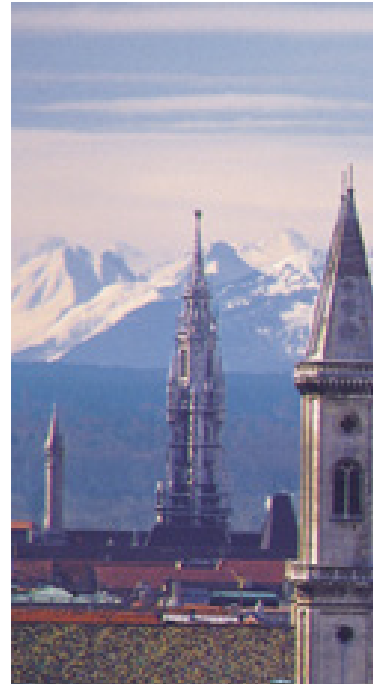
The Region **Bavaria**

The economic region of Munich is one of Europe's top business locations for aviation, astronautics, and satellite navigation, boasting 234 companies and 7 renowned research institutes. With a turnover of EUR 4.7 billion in 2006 and over 15,000 employees in industry and research, aerospace and satellite navigation make a major contribution to the economic power of Munich as a business location. Employees in these industries are highly qualified and specialised, 60% of the staff in aerospace and 83% in satellite navigation are university graduates. As a classic high-tech, research-intensive industry, aerospace is constantly providing other industries with significant technological impulses. Satellite navigation is emerging as a sunrise industry with the potential of becoming a key player in the coming years. Besides big system integrators such as EADS, there are well-known suppliers to the aerospace industry as well as to operations in specialised engineering and machining tools at all tiers of the supply chain in the Munich economic region. The aerospace and satellite navigation companies in the Munich economic region truly live up to the reputation of their field as being highly research-intensive: On average the aerospace companies invested 18.9% of their turnover in research and development. **www.bayern.de**

source: IHK für München und Oberbayern

The regional organiser **Anwendungszentrum GmbH Oberpfaffenhofen**

AZO was founded as an incubator to expand Oberpfaffenhofen, an important aerospace location in Germany, into a cluster focusing on European satellite navigation. Established in 2001, this incubation programme has seen through the creation of 38 new companies and more than 650 jobs. Since August 2009, AZO has managed the ESA Business Incubation Center Oberpfaffenhofen, Europe's fourth ESA BIC, and has already incubated 14 new start-up companies. The Free State of Bavaria, the European Space Agency (ESA), the German Aerospace Center (DLR), and local bank Kreissparkasse München Starnberg are the partners of this programme, contributing financial and technical support to the start-ups underdoing incubation with the aim of supporting 40 company foundations on location by 2013. As part of the ESA Technology Transfer Programme (TTP), ESA BIC Oberpfaffenhofen focuses on incorporating aerospace technology and expertise into start-up companies in new fields of the economy while benefitting from its direct proximity to the scientific knowledge and development network of DLR.

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**Meet the
Regional
Experts**

Photo: The Octavio
Frias de Oliveira bridge,
São Paulo - Brazil. View
from the North Tower
of the CENU complex
(Northeast of the bridge)
© Wikimedia Commons

The Region Brazil

The Federative Republic of Brazil is the largest country in South America and the only Portuguese-speaking country in the Americas. It is the world's fifth-largest country in terms of both geographical area and population. Brazil is the world's eighth-largest economy in nominal GDP and the ninth-largest in purchasing power parity. Economic reforms have brought the country new international recognition.

Technological research in Brazil is largely carried out at public universities and research institutes, with more than 73% of funding for basic research still coming from government sources. Brazil's most notable technological hubs are the Oswaldo Cruz Institute, the Butantan Institute, the Air Force's Aerospace Technical Centre, the Brazilian Agricultural Research Corporation, and INPE. The Brazilian Space Agency has the most advanced space program in Latin America, with significant capabilities in launch vehicles, launch sites, and satellite manufacturing.

The regional organiser **MundoGEO**

MundoGEO Publishing was created in 1998 to serve as the convergence point of the geomatics community and location services, trading experiences, professional updating, and business generation. The MundoGEO web portal is a leader in Latin America, Portugal, and Spain and one of the five most-visited web portals in the world in the field of geomatics. MundoGEO has two main differentiating characteristics: It produces content in three languages – Portuguese, English, and Spanish – and edits the magazines InfoGEO and InfoGNSS. InfoGEO is related to remote sensing, geographic information systems (GIS), and GeoWeb, while InfoGNSS focuses on surveying and cartography.

In partnership with three international institutions, MundoGEO participates in creating and maintaining the Galileo Information Centre for Latin America (GICLA). In 2010, MundoGEO started working on a new project called Enhanced Code Galileo Receiver for Land Management in Brazil (ENCORE).

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REGIONAL WINNER
GIPUZKOA / SPAIN

The Winners
Rafael Olmedo | Antonio Olmedo | Alberto Ayora

The Idea
SafeMountain – Mountain Risk Management System

DESCRIPTION

The popularisation of mountain sports and activities and easy access to mountain areas are resulting in an increasing number of related incidents.

Minimising risk exposure requires new services and real-time information for mountain enthusiasts. In addition, search-and-rescue operations in mountain scenarios must be optimised in terms of efficiency, time, and cost.

The SafeMountain system aims to increase people's risk awareness and preparation before they engage in sport and leisure activities in mountain areas, help them in case of an incident, and enhance the performance of search-and-rescue teams. The key goals of the system are to maximise safety and optimise resources.

SafeMontain provides mountaineers and search-and-rescue teams with intelligent assistance in mountain areas based on the use of smartphones and the integration of GNSS and wireless communication technologies, web services, and real-time risk information and management.

Photo: Incident and risks management and situational awareness may reduce accidents in the mountains.

INNOVATION

The system's main innovative characteristics include:

- Integration of mobile devices into a personal risk and emergency management tool through GNSS and wireless networks technologies
- Collection and recording of user profiles and activity plans, as well as storage in a shared repository
- Collaboration of amateur and professional mountaineers on gathering risk data
- Wireless distribution of risks and situational awareness information based on proximity marketing techniques
- Risk data management to improve territory monitoring and safety-and-rescue means and resources
- Use of social networks to increase mountaineers' awareness and motivation regarding safety

TARGET MARKET

SafeMountain will provide technology and services to governments and citizens involved in any kind of leisure or sportive activity conducted in a mountain environment, professionals and companies involved in activities developed in mountain scenarios that could require risk management strategies, and emergency search-and-rescue first responder teams.

CUSTOMER BENEFIT

- Increases mountaineer safety through online registration of planned outdoor activities
- Reduces risk exposure by providing risk information related to the user's position
- Provides support to emergency rescue teams in the form of risk information and additional assistance in taking optimal routes
- In addition to saving lives, the system will reduce the cost of medical and rescue teams, guide specialised personnel, aid accident research, and render statistical data.

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Photo: Reflections at
La Concha beach,
San Sebastian
© Iñigo Barandiaran

The Region **Gipuzkoa**

The province of Guipuzcoa, in the Basque Autonomous Community of Spain, has Spain's highest density of universities and research and technology centres: seven Institutes for Competitiveness and Cooperative Research, three industrial clusters, three universities, and six renowned research institutes. With a turnover in excess of EUR 13 billion in 2008 and over 10,000 highly qualified professionals engaged in industrial research, aerospace, communications, and electronics, this small region has become a hub of technology and innovation.

Behind this profile lies an industrial framework that actively promotes research and is fully supported by both the local public administration and the Basque autonomous government. This foundation enables advanced research in the fields of aerospace, communications and electronics, which is transferred to partners in the industrial sector and thus brings innovative and competitive products direct to market.

In addition to large integrators, such as Sener, IKUSI, and Gamesa, there are many other specialized SMEs that cover the entire supply chain for aerospace, communications, and electronics products.

The regional organiser Gipuzkoa & Spri

The Provincial Council of Guipuzcoa is committed to deepening its engage-
ment in supporting technological innovation and competitiveness and hereby
promoting an environment for industrial development and economic progress.

Aware of the importance of communications and navigation technologies –
and that the growth of service industries fundamentally affects global econo-
my - the Council has fostered a climate for business investment in research
and has created several programmes to fund start-ups, assist SMEs, and sup-
port research centres. Its principal objective is to promote development in the
region through initiatives that encourage economic growth and job creation.

The Bic Gipuzkoa Berrilan Centre for Business Innovation (CBI), founded by
the Council and the Basque Department of Industry, is engaged in a complete
set of activities aimed at supporting any innovative business initiative and the
incubation of new enterprises.

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The Winners

Dr Klaus Dibbern | Michael Hübl | Benjamin Kirschner

The Idea

Connecting Mobile Phones and Navigation Systems to Arrange Real-time Ridesharing

DESCRIPTION

Through real-time analysis of traffic movements, flinc is able to assign seats in cars within a few seconds. It combines GPS and location-based capabilities with social networking to offer a dynamic, safe, and automated service that gets you from A to B.

Passengers use their mobile phones to type in their destinations and send the information to flinc. Within a few seconds, flinc finds the drivers that match the desired criteria and sends the corresponding information back to the rider.

Riders can look at the profiles of the drivers, which include the price and duration of the ride in question. When accepted, the driver arrives and takes the passenger to his or her destination. Drivers receive ride requests directly in their cars on their navigation devices. With one click, they can accept rides and have flinc guide them directly to the passenger.

Photo: Easy-to-use,
real-time ridesharing
with flinc
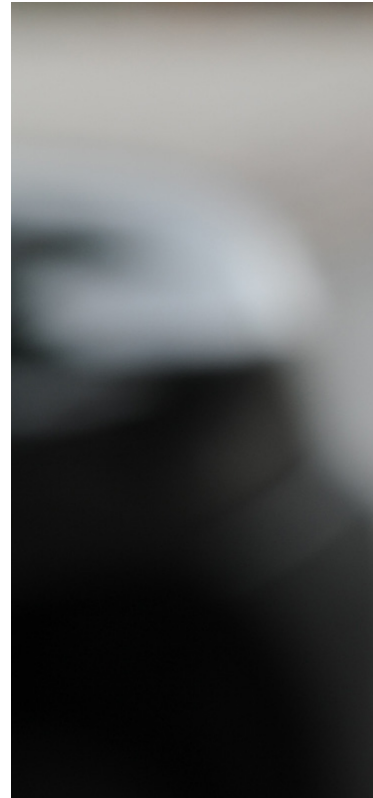
INNOVATION

flinc arranges rides within seconds and is able to integrate other means of transport. The combination of satellite navigation and smartphones enables flinc to provide a service that offers maximum usability to the end user.

TARGET MARKET

Millions of people already use ridesharing over long distances. The biggest ridesharing agency in Germany has over 1.5 million users, and all of the country's ridesharing agencies arrange a total of over 25,000 rides per day. The problem is that these existing ridesharing solutions only can arrange pre-scheduled long-distance rides. Of all the distances we travel, 80% are short, necessitating a fast, flexible system that is easy to use and involves minimal opportunity costs. flinc is just such a service.
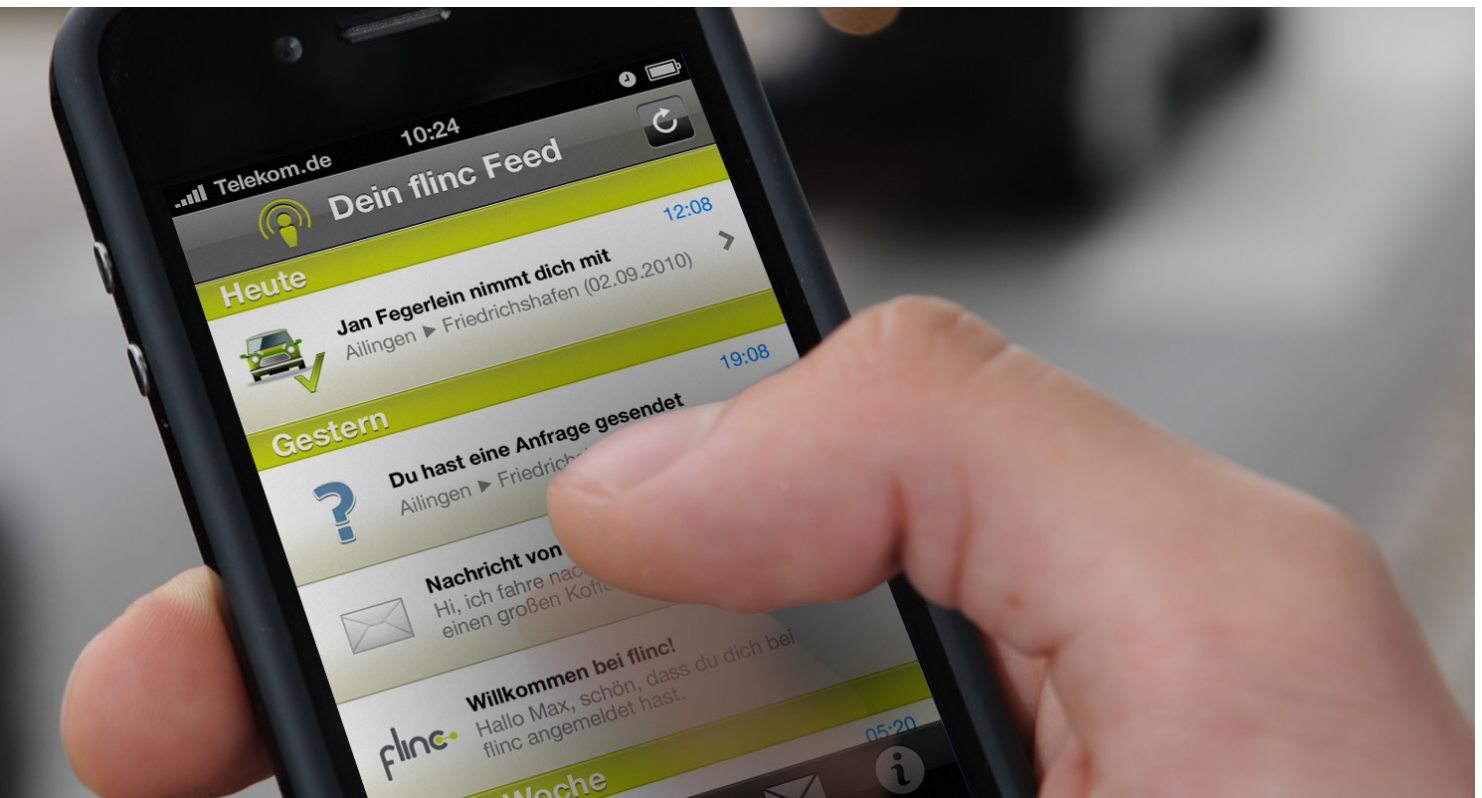
CUSTOMER BENEFIT

flinc gives passengers a flexible, cost-effective means of transportation and helps drivers reduce their mobility costs. Partner companies such as navigation system providers and mobile carriers gain a unique selling proposition, a positive image, and traffic on mobile internet accounts. Client companies can give their employees a system that enables them to save money, interact with fellow workers, and be more flexible in commuting. flinc can also help make taxis more efficient by arranging more rides and increasing capacity utilization. In combination with local public transport, this innovation can be part of an optimised system of flexible mobility for rural and mixed urban / rural areas.

flinc – move together
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Photo: Cityscape of skyscrapers at financial district, Main river and tourist boats near St. Bartholomäus Cathedral Frankfurt © maconga / fotolia

The Region Hesse

Hesse is the fifth largest federal state in Germany and holds the third position with regard to the gross domestic product per inhabitant. Located in the heart of Europe, the region is characterised by an excellent infrastructure with various traffic hubs for air (Frankfurt Airport) road, rail and Internet. The region of Hesse is very strong in logistics, IT, automotive, biomedical, optical and production technologies. Hesse is heavily involved in new media technologies, a considerable amount of IT/software providers are located in Hesse. Hesse is repeatedly the top region in Germany for multimedia. With its high density of innovative IT-companies/enterprises and its unique infrastructure (the central data transfer hub DE-CIX, which carries over 90% of the German and more than 35% of the European Internet traffic is located in Frankfurt), Hesse provides high potential for the development of satellite navigation based applications, services and products. The Hessian Ministry of Economical Affairs supports the development, deployment and usage of new technologies and the technology transfer.

The regional organiser cesah

The Centre for Satellite Navigation Hesse is a competence, information and incubation hub supported by its shareholders. These include the German region of Hesse, the city of Darmstadt, the Technical University Darmstadt, the University of Applied Sciences Darmstadt, VEGA Deutschland GmbH, T-Systems International GmbH and the INI-GraphicsNet Foundation. cesah is

partner of the ESA Business Incubation Initiative and is located near the European Satellite Operations Centre (ESOC) in Darmstadt. cesah supports the development of business ideas and start-up companies in the field of satellite navigation. **www.cesah.com**

Hessen-IT

Hessen-IT is the programme of the Hessian Ministry of Economical Affairs supporting the Hessian information and communication technology (ICT) sector in their market development, as well as small and medium-sized enterprises (SME) in their efficient and creative use of ICT. Hessen-IT provides information via online databases, news releases, brochures and workshops etc. Hessen-IT furthered and accompanied the satellite navigation activities in Hessen from the beginning and continuously supports the space incubator cesah, the Centre for Satellite Navigation Hesse, by organising workshops and congresses, offering an information and communication platform. Together with cesah, Hessen-IT supported and organised the regional participation in the European Satellite Navigation Competition. **www.hessen-it.de**

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The Finalists
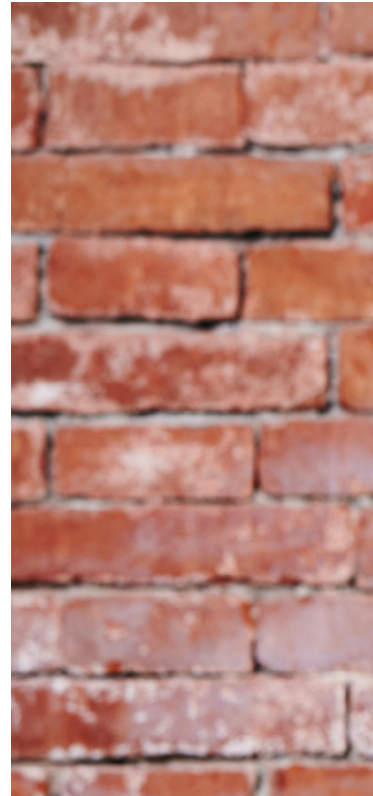
The Winner
Daniel Dobroszklanka

The Idea
Global Vehicle Traffic Monitoring System

DESCRIPTION

The Global Vehicle Traffic Monitoring System (GVTMS) is a proactive monitoring system that helps to control traffic infractions, avoid traffic accidents, proactively detect potentially dangerous drivers, and recreate traffic-accident scenarios offline (such as for insurance companies or legal process investigations.

Once installed in a car (similar to the black box in an aeroplane), GVTMS can collect GPS and record information. Every time the car stops at an intersection or refuels, the device uploads the information to a database or main network. Once this process is concluded, the internal memory can be deleted. The data is then analysed and scanned for predefined patterns of driving behaviour, or proximity in time and position to known traffic accidents and other irregular events. Applied nationwide, GVTMS could potentially encourage drivers to avoid speed infractions: It automatically detects traffic infractions and collects data on abnormal vehicle behaviour that can be statistically related to alcohol, drugs, dangerous driving, etc.

Photo: © toyota.com

INNOVATION

GVTMS presents unprecedented innovations in the way we currently monitor events and take action on motorways. It also provides a reliable tool for recreating traffic accidents and other roadways events offline – in order to identify witnesses, for example.

Besides helping to create statistical models, GVTMS offers the ability to proactively detect dangerous drivers and create mechanisms to improve traffic congestion. It also provides a starting point for creating a universal standard to guide the next generation of GVTMS equipment and software.

TARGET MARKET

The target market comprises mainly governmental departments of transportation and insurance companies all around the world, as well as car manufacturers at a later stage. Governments will adopt the GVTMS project and oversee its implementation, while insurance companies will rent services and reports for specific events and legal cases. Car manufacturers will then begin building the GVTMS system into their new models once the standardisation is complete.

CUSTOMER BENEFIT

An amazing and fast ROI is the most attractive benefit for customers, but it is only the beginning. Governments will have a system that improves roadway security and congestion, and at the end of the day GVTMS will save lives.

Insurance companies will enjoy a new source of reliable information that saves them a significant amount of money and may change/improve the car insurance concept. Car manufacturers, meanwhile, will have products compliant with the GVTMS standard to add value and security to their cars.

Satloo

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Photo: View of Tel Aviv cityscape from across the Mediterranean Sea.
© jorisvo / Fotolia.de

The Region **Israel**

Israel is one of the eight countries within the world space community demonstrating significant technological assets in space programmes and achievements in GNSS applications, equipment, and the user segment. It has participated in the Galileo programme since 2004.

An agreement between the European Union and the State of Israel provides for co-operative satellite navigation and timing activities in various sectors, such as science and technology, industrial manufacturing, service and market development, as well as standardisation, frequencies, and certification.

The European GNSS Supervisory Authority (GSA) has a bilateral agreement with MATIMOP for industrial cooperation in research and development. The first GIUS-1 call was launched in 2007. Under GIUS-1, seven research projects started in January 2008. A second GIUS-2 call was launched in 2009. Both individual companies and consortia can participate in GIUS calls, which are managed by MATIMOP in cooperation and coordination with the GSA. The contractual and financial requirements set by the Israeli Ministry of Industry, Trade and Labour (OCS) apply to the proposals.

Consortia are strongly encouraged to involve EU partners. However, EU participants cannot be funded directly by these calls and are encouraged to look for other sources of funding (e.g. Eureka, Eurostars, or bilateral R&D programmemes with Israel,). MATIMOP will advise EU participants on relevant funding schemes. Galileo@matimop.org.il

The regional organiser MATIMOP

MATIMOP, the Israeli industry centre for R&D, is a non-profit organisation acting on behalf of the Office of the Chief Scientist of the Ministry of Industry, Trade and Labor, which promotes technological and R&D cooperation and technology transfer activities between Israeli and foreign industries. A member of the Galileo Joint Undertaking (GJU), MATIMOP manages Israeli participation in the GJU and other Galileo projects. Currently, eight projects are running in Israel and a call is open to Israeli and European entities that wish to participate.

MATIMOP serves as Israel's national coordinator in international cooperative frameworks. As such, MATIMOP is Israel's EUREKA project coordinator, represents Israel within Galileo and SERAR activities, and is the country's national contact point in the Enterprise Europe Network. MATIMOP recently joined the European Space Incubators Network (ESINET) to enhance Israel's aerospace industry involvement in these activities. In addition to its international activities, MATIMOP administers national programmes including the MAGNET Programme for Generic Research and the National Technology Incubators Programme.
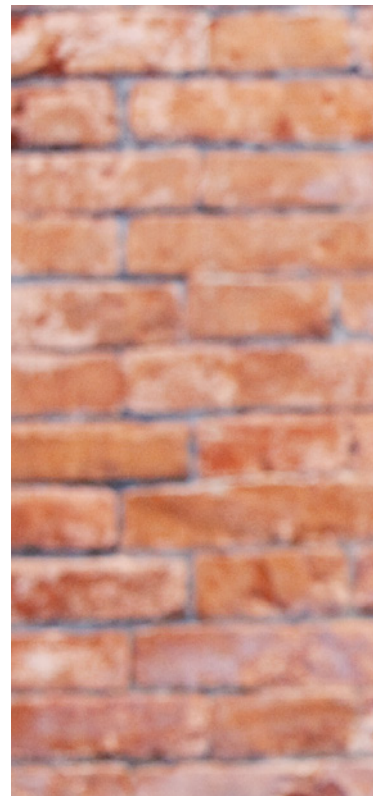
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The Finalists

The Winners
Žydrūnas Andruška

The Idea
GPS Tracker – BELT for Kidnapping Prevention

DESCRIPTION

Kidnapping can be a terrifying fact of life in Nigeria, India, Iraq, Russia, and other countries. Ransom kidnapping and armed robbery are easily the most serious domestic security problems many nations currently face. According to a report released in July 2009 by Ibrahim Yakubu Lame, Nigeria's Minister of Police Affairs, Nigeria recorded a total of 512 kidnappings from January 2008 to June 2009. On average, U.S.$1 million is demanded as ransom for one hostage. Consequently, U.S.$500 million is being lost to rescue hostages alone every year. Another part of problem is that these kidnappings are a primary reason why such countries are so unpopular with the foreign companies whose investments they wish to attract. Thirdly, kidnapping is a barrier to qualified foreign workers that countries like Nigeria need to ensure their further business development.

We understand that our new product will not solve these problems, but it is a first step toward a safer society.

GPS

Photo: A new approach
to people tracking – the
GPS Tracker – BELT for
kidnapping prevention.

INNOVATION

No similar product currently exists in the market, and demand is present in Nigeria, Iraq, India, Pakistan, and Russia. Security companies want to provide this device to their customers.

The product offers a number of advantages. For example, it looks like regular belt, so criminals can miss it while attempting a kidnapping. It can also be used by people with Alzheimer's disease, who are often afraid to carry any kind of electronic device. As such, this innovative TOBE GPS product will address a market niche of 26 million people affected by Alzheimer's.

TARGET MARKET

The direct target market is potential kidnapping victims.
The secondary target market covers individuals who care for those with Alzheimer's disease, which affects 26 million people worldwide.

The GPS Belt concept also has potential in connection with:
• Isolated workers
• Children

END USER SOFTWARE AVAILABLE ON INTERNET

S belt

Application with maps

CUSTOMER BENEFIT

The product will help our target customers – governments of developing countries – eliminate kidnappings, potentially saving hundreds of millions of dollars each year and accelerating these countries' growth.

TOBE GPS develops ways to make GPS technology easier to use in everyday life. Every step forward helps our partners distribute our products worldwide; the GPS Belt is a symbol of our further progress.

Additional customer benefits:

• Easy to wear
• Difficult to lose
• Extended battery life
• Resembles a normal belt for subtle tracking

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Photo: Rooftops of churches in Vilnius oldtown, Lithuania's capital. © V. Usinavicius
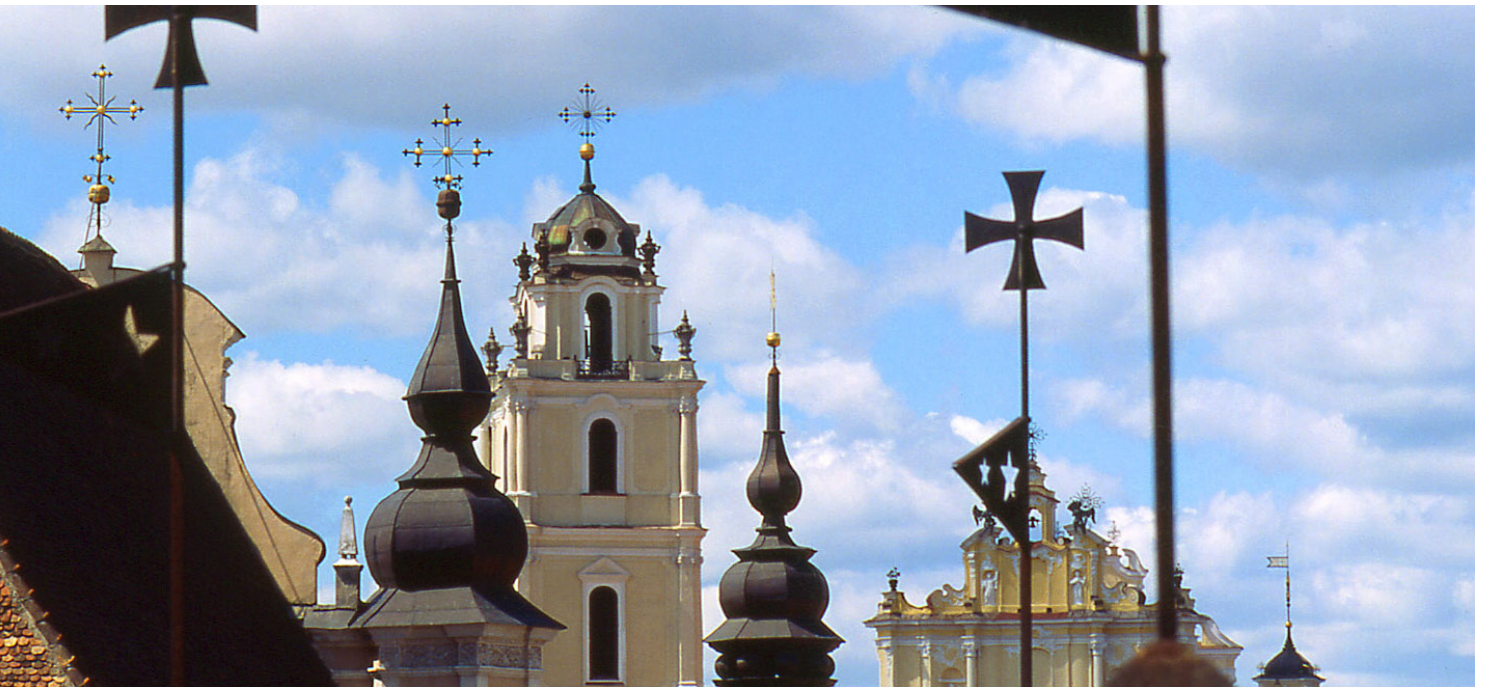
The Region **Lithuania**

Situated on the eastern coast of the Baltic Sea, Lithuania has a rich history and unique traditions, the oldest university in Eastern Europe, and a highly educated workforce (40 per cent with higher education). Having developed a sophisticated communications infrastructure, Lithuania leads the world in the number of mobile telephone subscribers per 100 citizens and has the highest GSM penetration in Europe.

The Government of the Republic of Lithuania has approved the National Long-Term R&D Strategy and its implementation programme in line with the provisions of its Science and Technology White Paper. With a view to the national need for hi-tech development, the Government has been working on facilitating the development of hi-tech production areas that have global prospects and the research potential necessary to produce globally competitive products. This programme provides for the development of R&D in biotechnologies, mechatronics, laser and information technologies, nanotechnologies, and electronics.
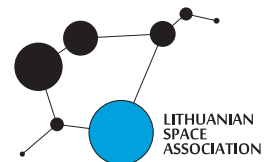
The regional organiser ## Lithuanian Space Association

The Lithuanian Space Association was established in 2009 to promote and support education, R&D, innovation, and other public activities in space-related fields. The organisation also seeks to achieve favourable conditions for entities in these fields, thus enabling them to serve business and governmental institutions as experts on space-related (and many other) issues.

Currently with 22 members from the fields of research and industry, the Lithuanian Space Association is supremely dedicated to its goal of enhancing Lithuania's science and business competitiveness in Europe and the rest of the world.

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The Winners
Giacomo Mangani | Alessandro Cantore

The Idea
Marine Telepass – Helping Protect Marine Reserves

DESCRIPTION

The Marine Telepass is an innovative system designed to provide easy, re-mote-controlled access to protected marine areas. Navigation restrictions in these areas can be difficult for visitors to understand; transit may be fully pro-hibited or limited to certain times and seasons. Management organisations usually force users to request a temporary permit to access parks with certain permissions. The corresponding patrols and checks are generally extremely costly: park areas are often vast and remote, and conventional, paper-based access systems do not support remote access control. In addition, filling in permit documentation directly at park reception areas can be a considerable waste of time for visitors.
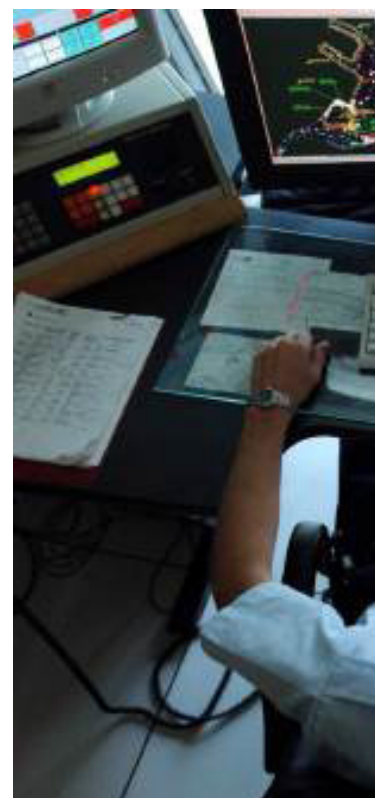
The proposed system aims to overcome these difficulties by introducing a more efficient control model, improving area surveillance and protection, and supporting visitors in the process.

**About the
Company**

**About the
Innovators**

INNOVATION

The Marine Telepass exploits the latest satellite and communication technology to offer a modern, efficient, and remote access control system for marine areas with navigation restrictions. The system also supports the collection of traffic-flow statistics, wildlife and other environmental observations, and alarm response, all of which contribute to safety and environmental protection. Meanwhile, Marine Telepass offers visitors innovative services such as remote billing based on visit duration and booking of mooring buoys.

TARGET MARKET

The main target market includes public and private maritime organisations involved in the control activities of marine reserves and restricted waters. This is a niche that shows consistently high interest in flexible, innovative solutions that increase efficiency and reduce costs.

Touristic seaports and private mooring-buoy parks, which experience a considerable influx of tourists during specific periods of the year, are also seen as potentially major commercial markets to address.

CUSTOMER BENEFIT

Maritime park protection organisations will enjoy reduced costs and im-
proved management efficiency. Meanwhile, park visitors will benefit from an
on-board device that enables fast tolling, thus avoiding further controls, al-
lowing for flexible park access, and simplifying final billing based on the du-
ration of stay.

An evolved version of the system will enable visitors to share information of
interest – such as fish observations, weather information and quality of water/
environment – with both park authorities and other visitors.

BLUE✓THREAD
NAVIGATION TECHNOLOGY

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Photo: Galleria Vittorio Emanuele II, Milan: The dome above the octagonal intersection of the two arcades.
© huzur / iStockphoto
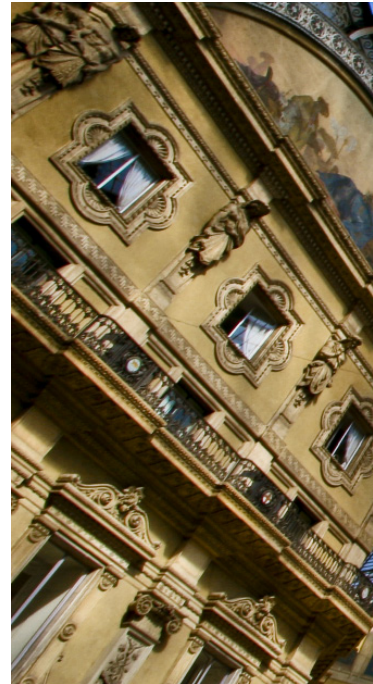
The Region Lombardy

The Lombardy region is one of the 21 regions of Italy, with a population of 9,650,000 (2006) inhabitants and an area of 23,861 sq km. (7.9% of Italy). The capital city is Milan. Lombardy has its own constitution, on which Lombardy`s "Consiglio regionale" and Executive Government are based. The Lombardy region has 12 provinces and 1,546 municipalities. Lombardy's GDP is EUR 305.5 m (2006), corresponding to 22.2% of Italy's total GDP. Lombardy is Italy's leading region in terms of innovation and is well situated with respect to the international market:

- Investment in R&D amounts to 1.27% of the regional GDP

- It is home to 12 universities, several research centres and the highest number of lecturers and researchers in Italy, amounting to approximately 7,500 people

- Of Lombardy's investments in R&D, 74% come from private enterprises

- Of the patents filed by Italians with the European Patent Office over the last 10 years, 40% have come from Lombard entities. **www.regione.lombardia.it**

RegioneLombardia

The regional organiser Navigate Consortium

Founded in Milan in 1989, the Navigate Consortium promotes and manages new aerospace initiatives and applications (including navigation innovation). It has also served as the Lombardy region's coordinator for the European Satellite Navigation Competition since 2007.

Aerospace is the focus of Navigate's main area of business, where it participates in important initiatives occurring at the local, national, European, and international levels.

In 2001, Regione Lombardia formally commissioned the Consortium to promote regional aerospace initiatives for northern Italy.

Navigate Consortium's partner companies include Intecs Sistemi, Euroways, ITS, Altran Italia, Telespazio, and Thales Alenia Space Italia, with further Italian space organisations potentially on the way.
www.navigateconsortium.it

NAVIGATE CONSORTIUM

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The Winners
Ezio Malis | Manuel Asselot

The Idea
Parking Availability with a GNSS / Vision System

DESCRIPTION

Nowadays, finding an available parking space in cities is becoming more and more difficult. Drivers waste a lot of time and fuel turning around searching for a place. Our solution aims to make the process easier.

We propose integrating an application that directs the driver to parking spaces available nearby into portable car-navigation systems. The idea fuses GNSS and computer-vision technologies to provide a reliable and very useful service that saves drivers time and money.

Whenever necessary, users can call up an accurate on-screen map of parking spaces in the vicinity. The occupied spaces are marked with a red symbol, while the empty spaces are marked green. When the system is not sure whether or not a parking space is occupied, the space is marked orange. The user can also visualise the path to the nearest empty space and let the car's navigation system provide the corresponding directions.
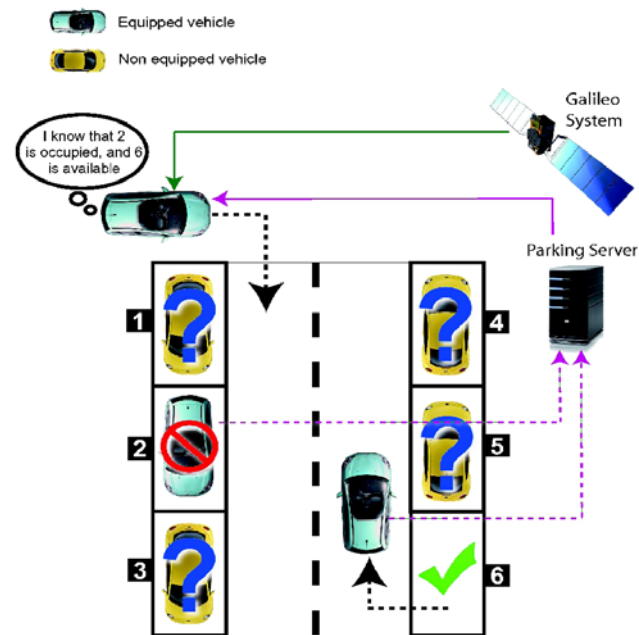
Figure 1

INNOVATION

A constant-perception system sends information to a centralised server that monitors existing parking spaces in a given city. In order to have the largest urban coverage, we propose three complementary perception systems to determine whether parking spaces are empty or occupied:

The first system is based on information on users' positions. All users of the proposed service will send anonymous data on their position to the server when they enter or leave a parking space (see figure 1).

The second system is based on a stationary observation system that monitors parking spaces. We can use existing video-surveillance systems or install our own (see figure 2).

The third system is based on a mobile observation system that monitors parking spaces. We propose embedding a vision system into portable car-navigation systems to analyse the images on board (see figure 3).

These three solutions are needed in order to quickly provide extensive coverage to users. At an early stage, users would not have enough information with just one of these systems. Following mass adoption by drivers, we could reduce the number of perception systems in the application.

Figure 2

Figure 3
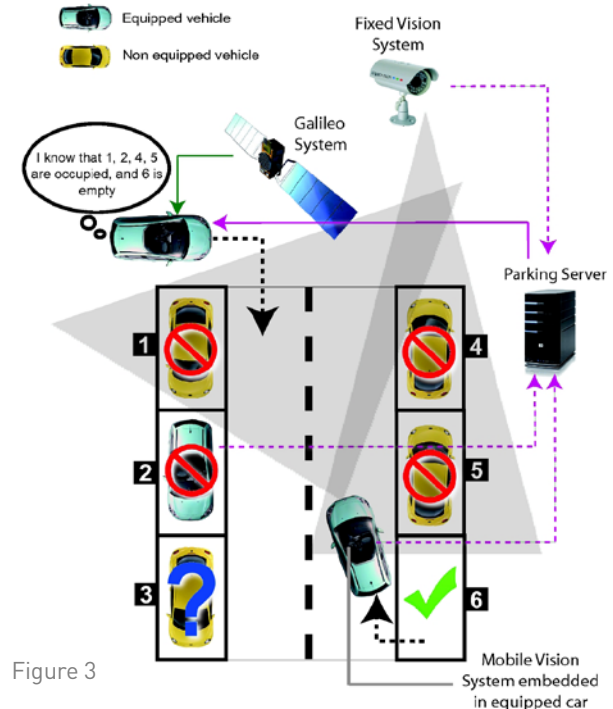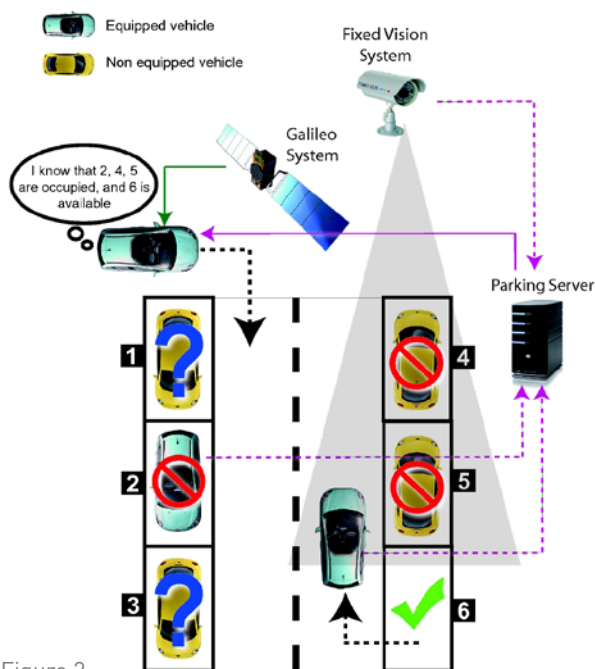
TARGET MARKET

We are targeting the mass market of frequent car drivers that waste a lot of time finding a parking space in urban areas. There are about 300 million personal vehicles in Europe, and around 10% are equipped with a portable navigation system.

CUSTOMER BENEFIT

Recent studies conducted in France have shown that the costs related to searching for parking spaces amount to approximately €70 million per year, which includes elements such as noise, car accidents, and air pollution. Factoring in the 70 million total hours drivers spend on this activity, the number increases €600 million per year. Our solution benefits users by saving them time and money. Communities will also benefit from our system in the form of reduced noise, car accidents, and air pollution.

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Besides design, development, integration, and satellite operation control the region is leader in mobile and satellite telecommunications, as well as earth observation and embedded electronic systems. Photo: © J.J. L'Héritier / Team Côte d'Azur

The Region **Nice - Sophia Antipolis**

The Nice – Sophia Antipolis region, among the top 10 most dynamic regions in the world in the satnav industry, is positioned to attract an additional 10,000 new jobs over the next 10 years throughout the aerospace sector – especially in navigation applications. Being present in every industry segment requires a combination of scientific excellence and industrial applications. The region's success stems from its excellent reputation at the national and European levels, both in innovative applications and standardisation.

5 reasons to choose the Nice – Sophia Antipolis satellite navigation cluster

- Southern Europe's "Mobile Telecom Valley", with skills in positioning, navigation, and dating technologies
- Vast R&D and innovation expertise (public and private research labs)
- A French leader in international R&D investment projects
- Location between the sea and the mountains ideal for developing pilot applications and conducting trials

4 competitiveness clusters support GNSS projects and applications:

- SCS: Secured Communicating Solutions
- MER: specialised in sea, security, safety, and sustainable development
- RISQUES: specialised in risk management and land vulnerability
- PEGASE: specialised in aeronautics and space

The regional organiser TEAM CÔTE D'AZUR

TEAM CÔTE D'AZUR provides a full range of services enabling you to set up your business on the Côte d'Azur:

- Qualified information: Team Côte d'Azur is your first point of contact to obtain complete information about the business scene.
- Assistance in relocating: Team Côte d'Azur guarantees confidential, exhaustive, and personalised assistance.
- Follow-up on integration: Team Côte d'Azur continues to support incoming companies in the various phases following their establishment.
- Help with development: Team Côte d'Azur will help you with local connections thanks to its strong presence in various institutional and professional networks.
- Promotion/communication: Team Côte d'Azur offers proactive communication to serve the interests of both companies and the region itself.
- Government grant engineering
- Assistance with personal mobility, including residence permit applications

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The Winner
Dr Peter Valtink

The Idea
**MPos - Indoor Navigation for LBS
and Navigation Wherever Satellite Navigation Fails**

DESCRIPTION

Satellite navigation alone is neither precise nor reliable enough to support the boom of location-based services in the pedestrian navigation market. Therefore, customers and consumers want multiple positioning technologies in the same product. Our solution, MPos, provides coexistence. Based on the dead reckoning principle, it can be seamlessly integrated with any other positioning technique, such as wi-fi positioning (WPS) or assisted GPS. MPos is a software-only solution, which sets it apart from competitors who have pursued a hardware approach. We also minimise power consumption by using innovative technology that employs a very low-complexity algorithm. Unlike all other positioning technologies that depend on already installed infrastructure, our technology is independent and allows for seamless integration with any other positioning technique. MPos is thus a perfect complement for satellite-based navigation devices.
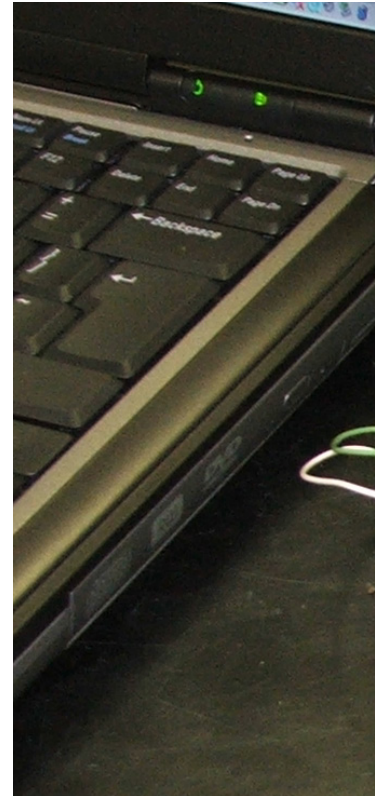
About the Company

About the Innovators

Photo: MPos Laboratory Prototype, © 2010 Prof. Haas, Jacobs University

INNOVATION

MPos is a new, infrastructure-independent dead reckoning technology that uses RF channel signatures. These are already measured by mobile devices during standby or normal operation. Our MPos method (patent pending) correlates these channel signatures to determine the speed at which the user is moving. Given this information, the displacement of the user from the last satellite reference location can be approximated and an estimate of his or her new location coordinates can be obtained. MPos is a collaboration project of Prof. Harald Haas (Jacobs University Bremen) and MobilTec GmbH & Co. KG and was co-funded by Bremen government (BIS Bremerhaven).

TARGET MARKET

Our target market comprises location-based services (LBS) and navigation solutions. Our target customers are original equipment manufacturers (OEMs) and original device manufacturers (ODMs) in the mobile phone and PND/GPS chip markets, as well as suppliers of object-tracking equipment. We also can build new devices for theft protection for the security market. These devices will be cheap and easy to apply. In addition to an onboard GPS receiver, our MPos device works indoors and even in case of a GPS jammer attack.
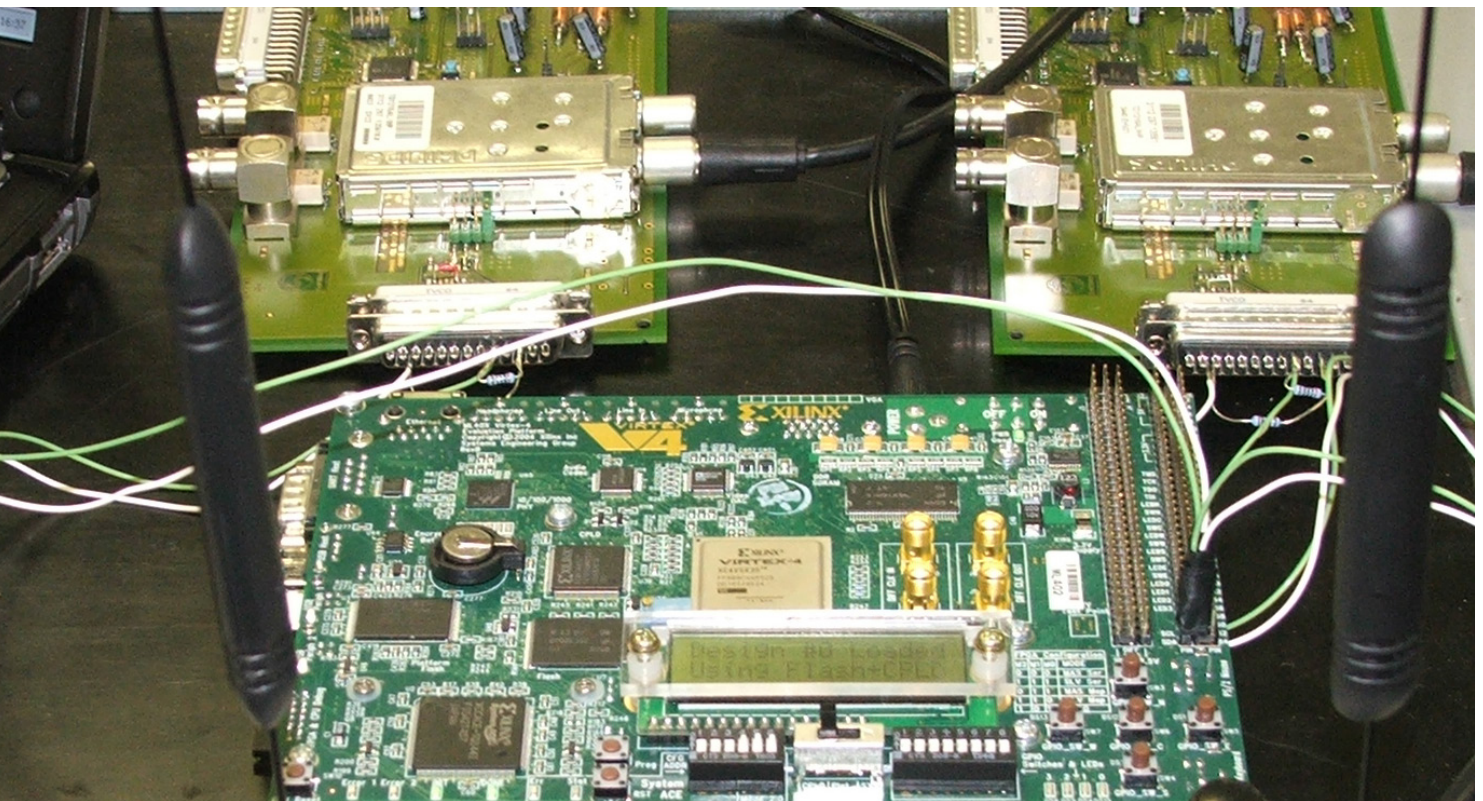
CUSTOMER BENEFIT

We add value to the products of our customers by enhancing the end-user experience. We achieve this by:

- Reducing manufacturing costs thanks to a smaller chip size
- Providing seamless integration with other navigation technologies
- Offering constant battery life based on a low-complexity algorithm
- Assuring high service quality, including continuous and reliable navigation under weak or nonexistent GPS signal conditions (urban environments, indoors, etc.)

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Photo:
Dankwarderode Castle,
City of Braunschweig

Meet the Regional Experts

The Region Niedersachsen

Braunschweig Research Airport in Lower Saxony: A Centre of Competence in Traffic Management and Transport Safety and Security.

Located in the Federal German State of Lower Saxony, Braunschweig Research Airport is an innovative cluster for intelligent transport systems (ITS) – especially satellite navigation applications. The airport's unique selling point is its concentration of major research establishments specialising in more than one mode of transportation:

- Aviation (with the Federal Office of Civil Aviation)
- Railway transportation (with the market leader in rail automation, Siemens Rail Automation)
- Road transportation (with safety-critical applications in cooperation with Volkswagen)

Braunschweig Research Airport and the organisations in its immediate vicinity are unique in their concentration of expertise related to multi-modal types of transportation, particularly in the safety-critical fields of ITS and GNSS. The airport also serves as a test centre for the transportation sector.
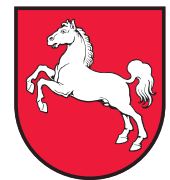
The regional organiser ## ITS Niedersachsen | GAUSS

The Galileo Center for Safety-critical Applications, Certifications and Services (GAUSS) combines and concentrates its members' competencies in safety-critical applications at the national and international level. As the support association of GAUSS, ITS Niedersachsen represent the interests of more than 100 companies and institutions. It is open to work with partners that have special expertise in the field of ITS, telematics, and the standardisation and certification of GNSS applications. A cornerstone of the commercial success of Galileo, standard-isation and certification represent a unique advantage over GPS. The majority of safety-critical applications need certification to minimise the risk of liability issues and other legal problems. In its new primary focus, GAUSS supports the implementation of eCall, the European emergency calling system for cars. The eCall system automatically dials 112, Europe's main emergency number, when a car has a serious accident and sends its location to the nearest emergency service. This can halve emergency response times, reduce severity of injuries and save the lives of people who do not know or cannot say where they are. eCall thus represents an ideal combination of the expertise of Braunschweig Research Airport and the enablement of new safety-critical applications, which is the intention of GAUSS.

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The Winner
Philipp Neuhaus

The Idea
Galileo / GSM-based Localisation of Persons in Distress

DESCRIPTION

After an earthquake, building collapse, or another catastrophic event, it is extremely difficult to determine the location of buried persons. After the 2009 collapse of the Historical Archive of Cologne, Germany, it was unknown for several hours how many people were trapped and where to search for them.

Today, almost everyone uses mobile phones, which exchange data with the corresponding network via GSM or UMTS nearly every second. By means of this status data, it is possible to determine the location of a person in distress within about 500 metres without the active assistance of the individual in question.

To achieve higher accuracy, the presented project plans to use special mobile search devices. These devices use Galileo/GNSS to determine their own position and are also able to measure the signal strength of buried mobile phones. The current locations and measurements of the mobile devices are exchanged via COSPAS/SARSAT. Thus, it will be possible to find out where people are located in short order.

The localisation device provides the user with information about areas where the buried persons might be found and which have not yet been scanned. The system also gives concrete recommendations to rescue workers regarding paths that should be explored next to close gaps in the area under exploration.

Photo: Green crosses symbolise mobile devices, and green arrows suggested directives. Red crosses, meanwhile, represent found mobile phones.
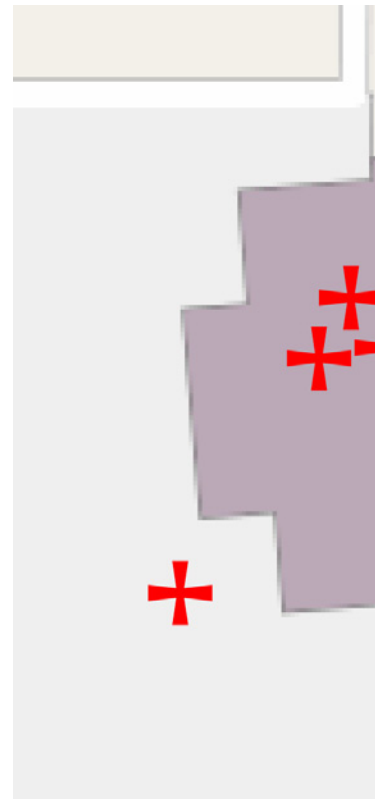
INNOVATION

The system uses the information provided by GSM packets to localise people in distress. To extend mobile devices' information basis, COPAS/SASAT is used to exchange information about buried victims. For the best possible support, the mobile devices will issue specific suggestions to the user about areas that need to be searched to fully cover an area.

As the figure indicates, search devices (shown in green) receive orders on where they should scan for mobile phones to achieve complete coverage of an area. Red crosses symbolise mobile phones already detected.

TARGET MARKET

Mobile search devices can be used by relief organisations to quickly obtain an overview of an area after a catastrophic event. Because of the increasing distribution of mobile phones, the chance that a buried person will have one is also growing. Using the devices' electromagnetic signals to localise their owners can save considerable time in rescue work, freeing up lifesaving appliances for other operations – or, in the case of a wide-area event, for other locations.
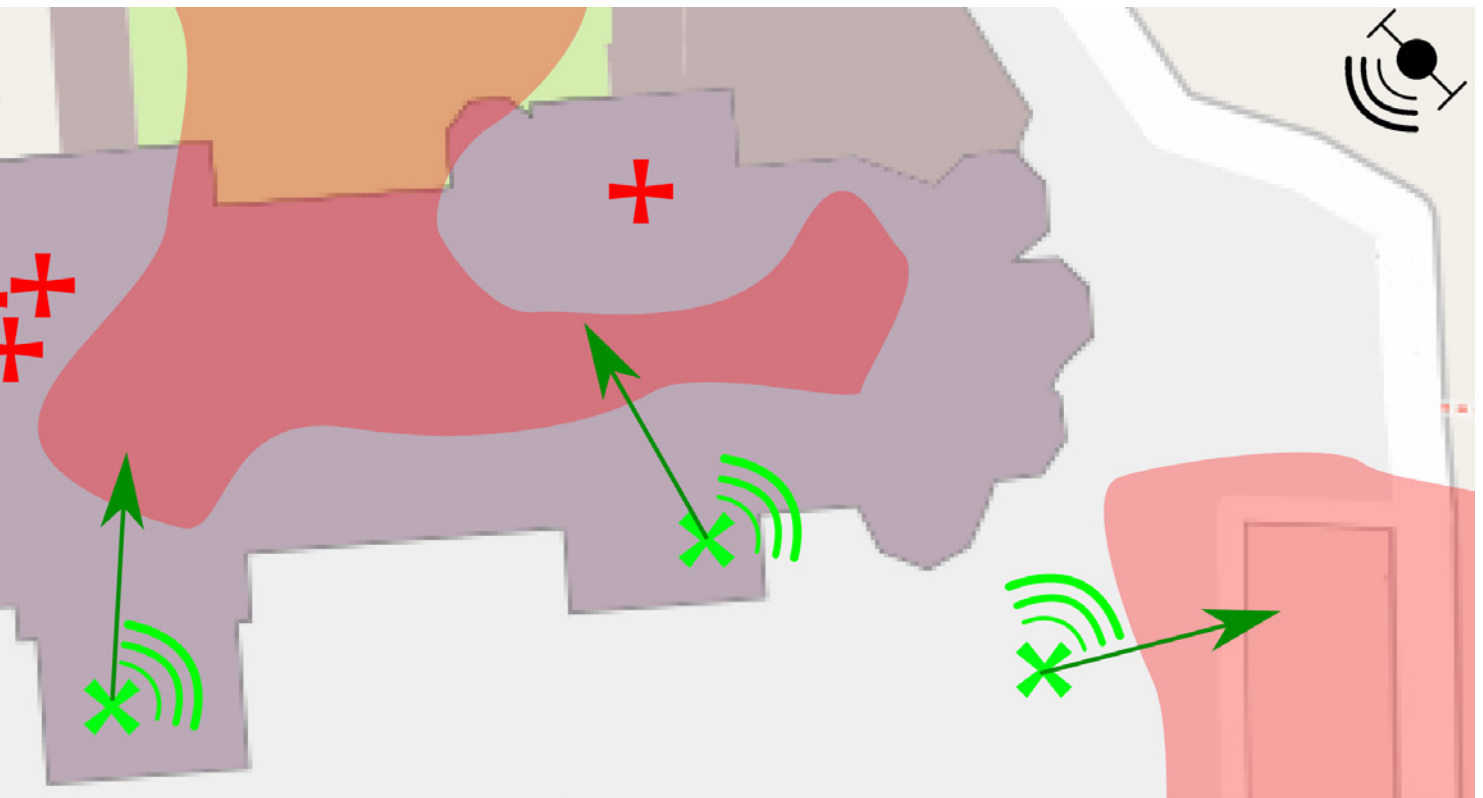
CUSTOMER BENEFIT

The system significantly accelerates the process of locating and rescuing peo-ple buried under rubble by providing relief organisations with highly portable, easy-to-use devices. Its self-organising aspect enables rescue staff to start the mapping process without any arrangements, and victims don't have to buy, carry, or interact with special equipment in order to be found. Thanks to its modularised design, the system can be enhanced, for example, with auto-mated detectors and sensors compatible with Bluetooth or WiFi.

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Photo: UNESCO world cultural heritage and landmark of Essen (european capital of culture 2010): Zeche Zollverein (pithead) © Ray / Fotolia.de

The Region **North Rhine-Westphalia**

North Rhine-Westphalia is home to over 500 companies involved in satellite navigation. Germany's most populous federal state is also home to the German Aerospace Center, which has some of the most important basic research establishments. The association of users for integrated spatial information and technologies – AIR (formerly known as NAVISAT) – wants to pool these skills in NRW and promote the industry in expanding its activities in the field of satellite navigation. The focus is on providing support to commercial applications and services on the basis of existing and future satellite navigation systems (GPS, GLONASS, GALILEO) by incorporating satellite-positioning technologies into specific applications. In addition to pooling the skills present in North Rhine-Westphalia in the field of satellite navigation, AIR seeks to promote the cross-sectoral exchange of ideas, knowledge, and information among its members. **www.nrw.de**

The regional organiser AIR / NAVISAT

On 20 March 2006, NAVISAT was founded on the initiative of the Ministry of Economic Affairs and Energy of the State of North Rhine-Westphalia (MWME) by 10 industrial enterprises. The association's goal is to establish North Rhine-Westphalia as a constant player in the GNSS landscape. In summer 2010, NAVISAT changed its name to AIR while adding the topics of spatial data and GMES to its activities.

Headquartered in Herne, Germany, AIR wants to condense the competences of North Rhine-Westphalia in the sector of satellite navigation and promote this field's development. It directs its support primarily to applications and services related to the satellite navigation systems GPS, GLONASS, and Galileo. Therefore, the members of AIR want to promote the exchange of experiences and intensify their contact with apprenticeship and research. With common research and developing plans, the expertise of the measurement sector should be also open up to other technology industries to exploit the potential of satellite navigation. The MWME and the business development association of Herne support the initiative. **www.air-verband.de**

AIR
Anwenderverband für integrierte
Rauminformationen und Technologien

Anwenderverband für integrierte
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The Finalists

The Winners

**Jakob Jakobsen | Sune Nordentoft Lauritsen |
Michael Avngaard | Flemming Hansen**

The Idea

Cardiac Arrest Alert and Localiser (CAAL)

DESCRIPTION

The CAAL project addresses a significant societal problem: sudden cardiac arrest (SCA). More than 70% of all cases of SCA in Europe happen outside of hospitals; only 5% of the victims survive, amounting to around half a million deaths each year.

When someone is struck by SCA, time is of the essence. The probability of survival decreases rapidly in the first few minutes, making the speed of the first emergency response absolutely critical. This is why publicly accessible automated external defibrillators (AEDs) have been placed in locations large numbers of people pass by or spend time in. Fast access to AEDs can increase survival in 75% of all cases of SCA. However, in order for public access to AEDs to be of optimal value, the nearest AEDs must be brought to the scene of emergency as rapidly as possible – even if their location is not known. This is the problem the CAAL project seeks to address.

Photo: AED placed at main railway station in Copenhagen.
© Trygfonden
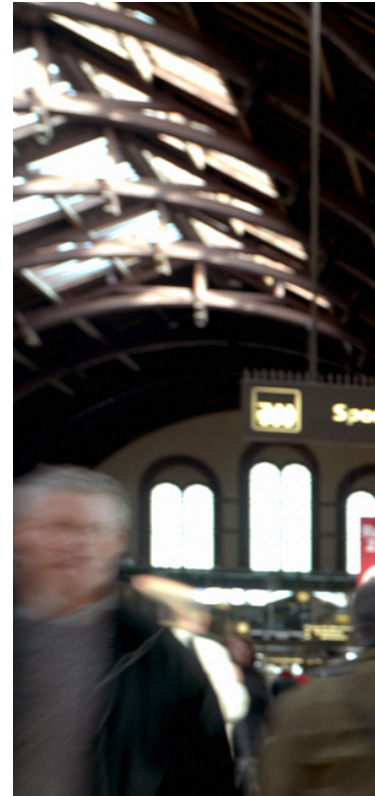
INNOVATION

The CAAL solution comprises two key elements:

- A technology package that is added to existing AEDs or integrated into new AEDs and contains – among other units – an advanced GPS / GLONASS / Galileo-based navigation unit

- A mobile communication and database system that is integrated with emergency services

The novel combination of these elements makes it possible to significantly reduce the time between detection of a sudden cardiac arrest and treatment with an AED.

TARGET MARKET

The global commercial market for AEDs in 2010 is on the order of €1 billion. It is expected to grow by more than 10% annually in the coming years. The CAAL project is targeting the primary AED market segment: the institutional market that buys publicly accessible AEDs.

CUSTOMER BENEFIT

The value proposition of CAAL involves a very significant functional advantage: It facilitates a more rapid emergency response with AEDs, thus increasing the chances of saving lives. If the average response time for out-of-hospital SCAs is reduced by just one minute, more than 50,000 lives could be saved in Europe every year.

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National Space Institute

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**Meet the
Regional
Experts**

**Regional
Partners /
Sponsors**

Photo: Connecting
Sweden and Denmark
(Malmoe and Copen-
hagen) this bridge is
one of the longest of it's
kind in the world.
© Johan Ramberg
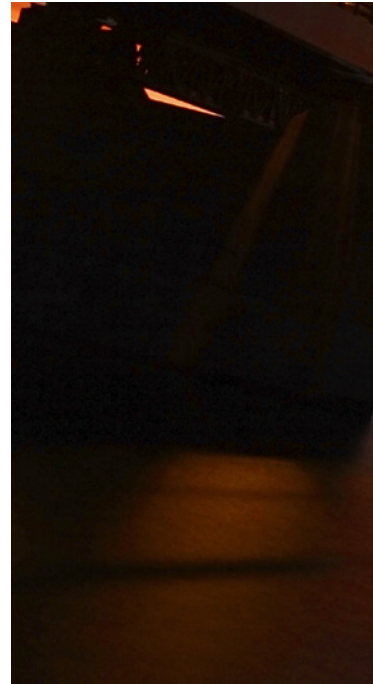
The Region **Øresund**

The Øresund region is among the most innovative and
well developed cross-border regions in Europe and has a
very high density of ICT companies. The uniqueness of this
region lies in the cross-national collaboration between
Denmark and southern Sweden, between which Øresund
("the Sound") flows. Cluster collaboration among various
industries such as IT, food, logistics, and the environ-
ment makes the region strong and able to present many
competencies. As the region is home to many large, well
known brands in the field of wireless technology – among
them Sony Ericsson, Nokia, and Microsoft – it is also only
natural that the region should be a place for new innova-
tions within the field of positioning services. Especially
within different types of mobile applications and gaming,
there are a large number of new companies growing in
the field of GNSS services.

CLUSTER 55°
ICT ØRESUND
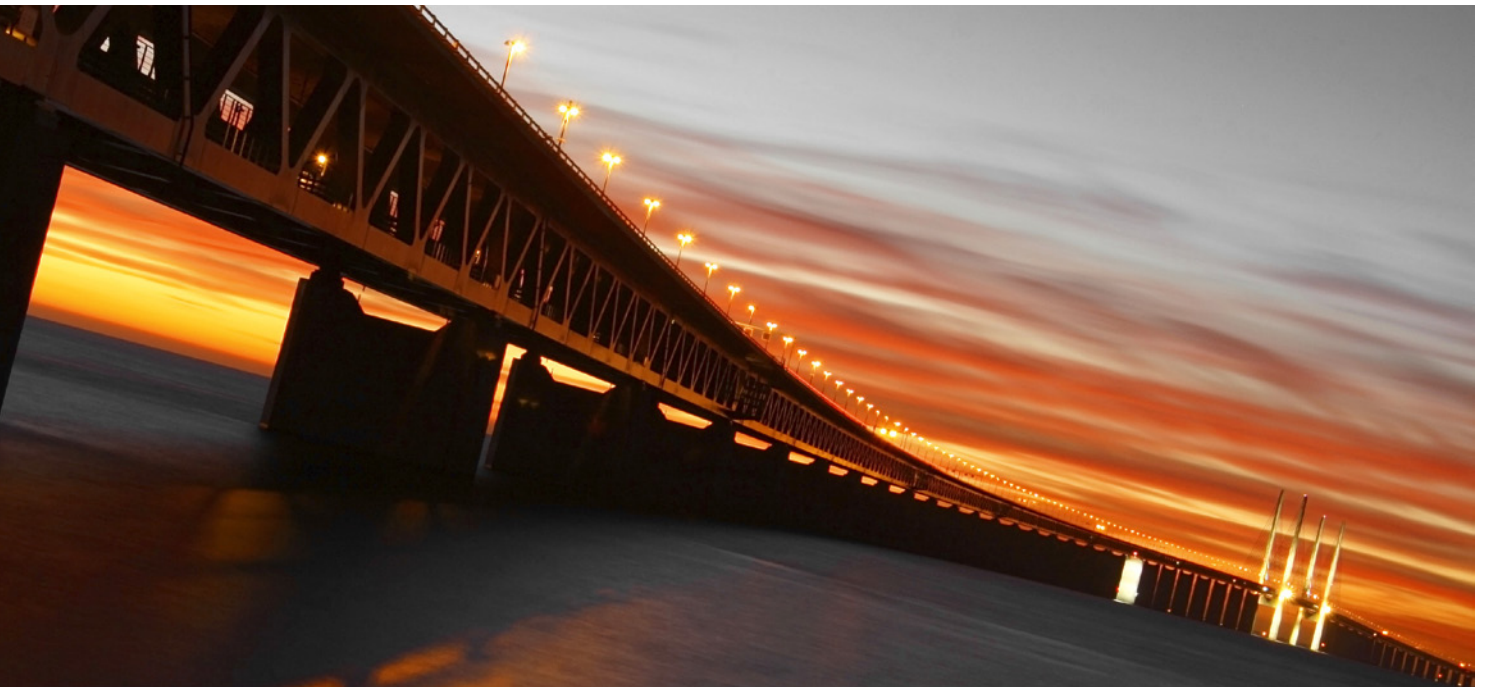
The regional organiser ## Øresund IT

Øresund IT is a non-profit organisation uniting Danish and Swedish ICT players in the Øresund IT cluster. Øresund IT serves as a hub for sharing knowledge and contacts among these entities. We strengthen the ICT cluster in collaboration with well-established companies and innovative start-ups, which makes Øresund IT the leading network organisation in the field. Our goal is to promote the ICT cluster of our region and attract more investment, research, and talent. We deliver these unique values by combining best practices from the Swedish and Danish systems.

We are a member-based organisation, and our contributors range from small high-growth companies to well-established international corporations. We promote and sustain the development of the ICT cluster in the Øresund region, a vital European ICT area with more than 100,000 employees, 12,000 companies, 8,000 students, and 500 public researchers within ICT. Supported by the region's 12 universities and national and regional authorities – as well as the business community and venture capitalists – Øresund IT is a catalyst for new business and projects.

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The Winners
**Dr Jaroslav Jansa | Augustin Sobol | Filip Sobol |
Kamil Knotek**

The Idea
DVB Disaster Monitor

DESCRIPTION

The goal of the project is to create an international system for monitoring emergency situations and implementing an information communication and localisation system that functions reliably and independently regardless of the scope of the disaster at hand. Current and emerging IT technologies are able to cover the all of the required functionality in a stable fashion. However, no such system has been implemented yet at the organisational level. International Charter Space and Major Disasters (Charter) has been used as a model for creating the proposed system.

Unlike Charter, which has no solution for communicating with rescue vehicles in the field, the proposed DVB Disaster Monitor has solved the issue of localising vehicles and rescue team members enabling them to communicate with staff vehicles and control centres through broadband communication (maps, satellite images, and other visual aids). It combines the benefits of GNSS systems (GPS, EGNOS, GALILEO) with those of wireless communication technologies (WiMax, LTE) and, recently, also with special RFID class elements with range of 3-5 km.

Location
services

Disaster
Data
Source

Resc
actio
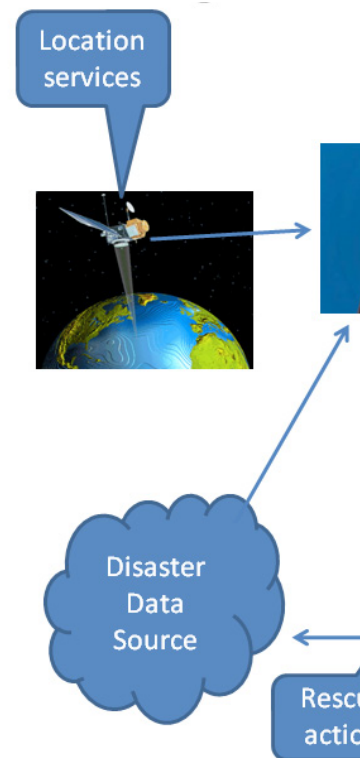
Photo: Disaster
Dispatch Chain

INNOVATION

DVB Disaster Monitor presents a new concept of communication and loca-
lisation for crisis situations, with emphasis on innovative components that
include:

- An interface for existing PMR-class (TETRA, TETRAPOL) backbone com-
munication networks in Europe and proposed broadband communication
platforms
- A MosSenNet of field data sensors (seismic, rain, fire) for preventing crisis
situations
- New long-range RFID communication technology

TARGET MARKET

The target market of the project consists of integrated rescue teams, mainly
those involved in police, fire brigade, and medical emergency services. This
market is very conservative by its nature, overestimating the "necessity" of
closed, controlled – usually military – development. As a consequence, com-
munication services for bank applications have the same (if not better) lev-
el of protection as traditional technologies for security and military systems
thanks to the huge market for mobile applications (GSM, GPS, RFID).
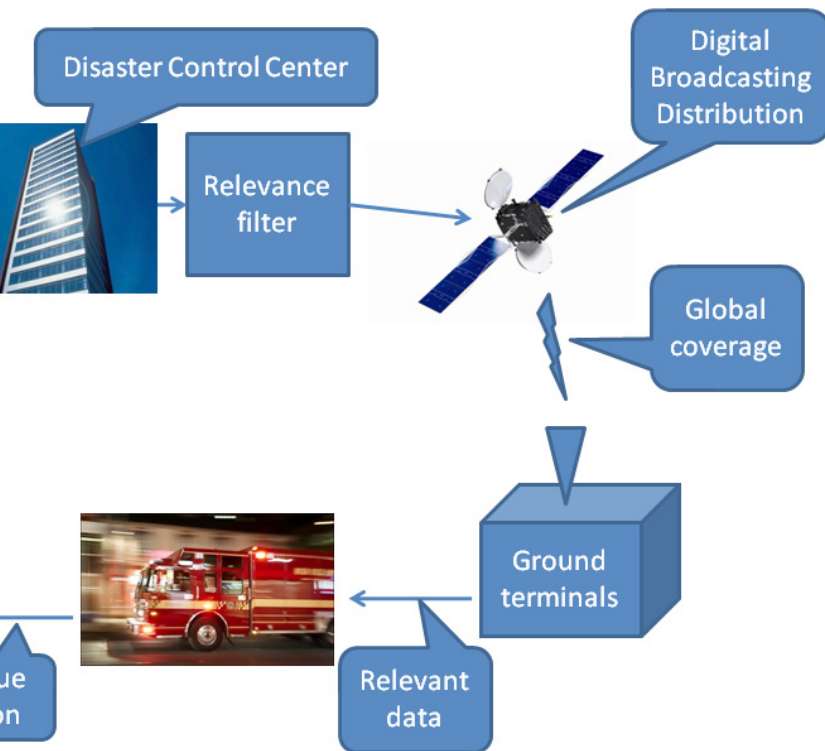
CUSTOMER BENEFIT

This is a unique project aiming more at achieving substantially improved European security systems and enhancing quality and safety of life by an order of magnitude. In doing so, it will be necessary to change the conventional infrastructure of these systems, some of which were designed in the 1990s. As a multinational project, it should be included among the R&D projects under the space and security priority of the 7th Framework Programme.

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Photo: Panorama view on Prague Bridges at sunset. Prague Castle (in the front) is the official residence of the president of the Czech Republik and the most sigtnificant Czech monument.
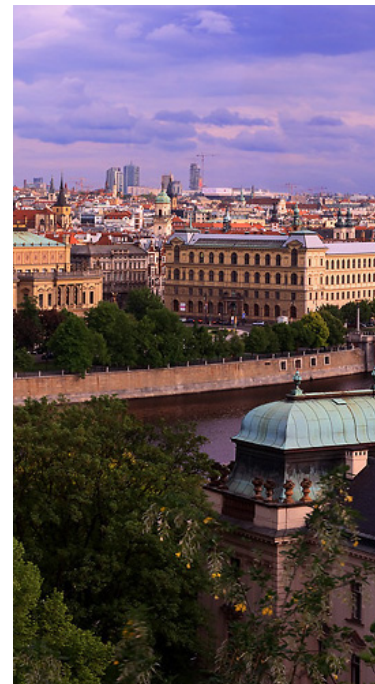
The Region **The Czech Republic**

Prague is both the capital city of the Czech Republic and it is its political, economic and cultural centre. Economic activity in the city of Prague creates, on a sustained basis, almost one-fourth part of the country's GDP. The city of Prague is an intellectual centre of the Czech space industry. It is home to many firms, institutions and research institutes dealing with astronautics and space technologies. Space exploration and research have a long tradition in the Czech Republic. The Intercosmos 1, launched on 14 October 1969, was the first satellite carrying instruments developed in the former Czecho¬slovakia. Several dozens of Czech instruments and systems have been employed during twenty years of space project activities covering terrestrial environment explorations as well as planetary missions. The Czech Republic is now the 18th member of the European Space Agency. The main objective of national space activities is the participation in the greatest number of European space programmes as possible. The Czech Republic is a place of excellence for aeronautics, space technology, satellite navigation, Earth observation, geoinformation systems and aerospace research.

The regional organiser ## The Ministry of Transport of the Czech Republic

The Czech Ministry of Transport is a state administration central body acting in the matters of transport. It is accountable for the creation of national transport policy and also for its implementation within the scope of its competence. The Ministry of Transport has a governmental competency concerning the participation of the Czech Republic in the European program of satellite navigation GALILEO and it plays a role of a national coordinator in the field satellite navigation development.

Ministerstvo dopravy

The Ministry of Transport supports and finances research and demonstration projects focused on the field of satellite navigation. In the period of 2001 – 2006, the most important research project covering pilot tests dealt with the GNSS receivers, including their utilization in the practice, having a total budget of 2.6 M€.

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REGIONAL WINNER
SOUTH HOLLAND / THE NETHERLANDS

The Winners
Ferdi de Bruijn | Teun Hoevenaars | Jon Reijneveld

The Idea
ReMood – Connecting Festival Crowds

DESCRIPTION

ReMood will enter the festival market with an innovative system that provides both attendees and organisers with previously unavailable location-based information streams. This is facilitated by a personal interface handed out to all attendees of a festival that allows them to interact with a central system. They select their mood and are immediately directed toward their preferred "moodspace" – a place to find like-minded people.

The festival experience of attendees is thus enhanced by the possibility to share moods and connect to local social networks of like-minded individuals. Organisers benefit from ReMood in the form of real-time information on the social moods, locations, and needs of their customers. This information can be used to better serve festival attendees. Finally, ReMood can be instrumental in monitoring the position, density, and movement of crowds, which could increase the safety of attendees.

Photo: Artist impression of ˈmoodspacesˈ in a festival crowd. ReMood will assist festival attendees in navigating to their preferred moodspace.
© 2010 ReMood

**About the
Innovators**

INNOVATION

ReMood bridges the gap between virtual social networks and real-time social events by introducing a smart system into the festival market. By releasing new information streams, ReMood brings festival attendees with similar social moods together and allows organisers to gather input from their customers. Festivals need to innovate continuously to remain attractive to their customers; by empowering both festival attendees and organisers, ReMood clearly adds value in this demanding market.

TARGET MARKET

ReMood will initially target the festival market in the Benelux countries. In this region, over 1,700 festivals are organised every year. ReMood's target market will then expand to other countries in western Europe and the United States. These expansions are foreseen two years after initial market entry.

CUSTOMER BENEFIT

Attendees can enrich their festival experience by connecting to local social networks and meeting like-minded people. They can also provide (collective) feedback to the organisers on their experience, who can react in real time to their needs or directly address safety issues. Furthermore, additional location-based services may be included to further increase customer satisfaction.

ReMood
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www.remood.eu

Photo: Windmills in the Netherlands

The Region South Holland

Zuid-Holland (South Holland) is a bustling, multifaceted province. It is home to 3.5 m people, who inhabit an area of around 2,900 sq km. This makes it the most densely populated of the 12 Dutch provinces, with 1,220 inhabitants per sq km.

The ambition of the province of South Holland is to become an international leader in innovative business. The potential is fully present: the province of South Holland has enough entrepreneurs, research institutions, educational institutions and government institutions with an existing head start in the knowledge arena. South Holland has various centres of knowledge and expertise, including three universities in Leiden, Delft and Rotterdam, the TNO research laboratories, ESTEC and the Innovation Centres. South Holland is the country's most important province in terms of economy, agriculture and the provision of services. It is a hive of activity, criss-crosses by a busy network of roads, railways and waterways. Rotterdam with its mainport is South Holland's largest city.
www.zuid-holland.nl

The regional organiser Kennisalliantie

The purpose of the Kennisalliantie is to add impetus to innovative industry in the province of South Holland. While the entrepreneurs, the research institutions, educational institutions and the government institutions are already operating innovatively in their own respective fields, real progress in the knowledge economy demands real cooperation. The aim of the Kennisalliantie is to bring organisations and entrepreneurs in the space industry together with those from other sectors – both literally and figuratively. The Kennisalliantie's initiatives foster inspiring collaborations among such entities while giving rise to new initiatives within each of the groups involved.

The Kennisalliantie is an independent platform for cooperation between educators, explorers, enterprise, and executives of the authorities. Its independence renders it extremely suitable for acting as an intermediary.
www.kennisalliantie.nl

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REGIONAL WINNER
SWITZERLAND

The Winners

Manuel Grauwiler | Dominic Gschwend | David Leuzinger | Martin Wyss | Luc Oth

The Idea

alcedo – the flying avalanche transceiver

DESCRIPTION

Alcedo is a lightweight mini-helicopter with four rotors. Combined with a state-of-the-art avalanche transceiver, alcedo searches autonomously for avalanche victims without the need for human involvement. The four rotors can be folded upwards to reduce its transportation volume, which enables Alcedo to fit, protected by a shockproof casing, into any backpack.

The operator enters the area to search using an integrated, intuitive user interface. The drone thus knows where to search for victims. An ultrasonic sensor measures the distance to the ground and maintains a constant flight height to avoid collisions with environmental obstacles and rescuers.
Alcedo uses a GPS module and a magnetic compass for orientation on the avalanche site. While flying over the avalanche, alcedo constantly looks for avalanche transceiver signals. After detecting one, it localises the transceiver, flies to the corresponding position, and drops a smoke beacon. Meanwhile, rescuers can prepare their rescue gear and wait in a safe area for a marker to be dropped before immediately rushing to the victim's aid.

Photo: CAD rendering
of alcedo prototype.
© Team alcedo, 2010

INNOVATION

The prototype is built upon state-of-the-art electronic components mounted on a newly developed, extremely lightweight and foldable quadrotor. The concept of using drones for alpine rescue is entirely novel. A set of highly sophisticated localisation and navigation algorithms based on GPS have been developed to enable alcedo to localise a detected victim within less than 10 seconds.

TARGET MARKET

The device was originally designed for freeriding and ski touring enthusiasts. The development of the off-piste market is facing a strongly increasing demand for high-end avalanche rescue systems. alcedo primarily targets professional rescue parties (REGA, Air Zermatt, etc), but freeriders interested in high-end technology are not excluded.

CUSTOMER BENEFIT

This easy-to-use, high-tech product will help professional rescue parties save lives. The speed and precision of alcedo reduce the time required for the rescue process and maximise the chance of survival. alcedo searches autonomously for avalanche victim and marks their position while rescuers wait in a secure nearby area. Using alcedo is much faster, safer, and far less exhausting for rescuers than conventional means of searching for avalanche victims.

alcedo - the flying avalanche transceiver
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Photo: Panorama view of Swiss Alps from Zurich Airport (with airplane in the front)

The Region Zurich and Nidwalden (Lake Lucerne area)

Zurich is one of the world's strongest economic locations, offering moderate taxation, attractive conditions for companies, an excellent telecommunications infrastructure, and leading educational institutions. A recent renewed increase in immigration has confirmed that the region's level of attraction for both people and firms remains high. In Zurich and Nidwalden, innovation is seen as the key to success – measured in terms of growth, prosperity, employment, and quality of life – at every level of the economy and society. Relative to its domestic production, Switzerland is well ahead of the European curve with regard to R&D investment and the share of R&D expenditure borne by its private sector (73.7%).Zurich and Nidwalden have a deep pool of labour in industries with excellent innovation potential. Even in the market for cutting-edge products, the region more than holds its own and achieves a high degree of value creation intensity. Of the products Switzerland exports to international markets, 73% are innovation-intensive. The Nidwalden / Lake Lucerne area is the home of the Swiss aviation and aerospace industry. Thanks to their focus on value creation and technology, the traditional industrial locations in this region maintain an excellent position on the global stage.

www.location.zh.ch // www.nw.ch

The regional organiser swiss aerospace cluster

swiss aerospace cluster facilitates the transfer of knowledge and technology in Switzerland's aviation, aerospace, satellite navigation, and supply industries by working with companies and cooperating with technical colleges, research institutions, government authorities, the European aerospace clusters, the European Space Agency (ESA), and with related organisations from other countries. At the moment, swiss aerospace cluster is supported by the cantons Zurich and Nidwalden – as well as by Osec with regard to its export platform – with funding from Switzerland's economic stimulus programme.

swiss aerospace cluster maintains a communications and export platform on the Internet. This both ensures a coordinated market presence together with other partners of the aerospace industry – thus strengthening Switzerland as an important industry location – and provides a simple and effective means of communication and cooperation to interested parties in the aerospace sector.
www.swiss-aerospace-cluster.ch

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REGIONAL WINNER
TAIPEI / TAIWAN

The Winners

Dr Tsung-Liang Wu | Jose Valenzuela | Chinchi Liao | Yunpeng Hsu | Chingshun Chen | Dr Yu-Liang Chung

The Idea

Credit Card Identification Based On Your Location

DESCRIPTION

The increasing usage of credit card transactions is presenting new challenges in the realm of security. The main purpose of our invention is to provide a feasible approach to authenticating credit card users. With this novel method, cardholders can avoid the complications involved in card misplacement, theft, and fraud (including skimming). We call it Double Check.

The Double Check service can provide authentication not only in brick-and-mortar stores, but online, as well. The volume of online transactions is increasing dramatically, and with it cases of online fraud. Double Check provides a physical tool to protect transactions in the digital world.

Double Check will be supported by existing technologies, including GNSS (and soon, Galileo-compatible) positioning systems, 3G and 3.5G wireless communications, and indoor navigation (Gyro+MEMS). Nearly every modern smartphone includes all of these technologies, which means the Double Check service can easily be installed.

GNSS

⑤

④

Cellular phone

INNOVATION

By using GNSS technology to compare the positions of users' mobile phones and shopping destinations, the Double Check service can provide feasible authentication of credit card holders. Via 3G/3.5G networks, credit card companies can utilise the global positioning capability embedded in cardholders' mobile phones to check whether the credit card is close to the cellular phone. Double Check thus provides for a much more secure shopping atmosphere.

TARGET MARKET

The main target market of the Double Check service is credit card banks. Currently, credit card banks send out text messages to cardholders when they generate a higher volume of transactions . By utilising Double Check, credit card banks can reduce or eliminate the expenses involved in this activity. The Double Check service also offers potential benefits to telecom companies, who stand to gain many 3G/3.5G subscribers.

Data Center

Network

Data Center

Store Shopping **Online Shopping**

CUSTOMER BENEFIT

- Helps credit card banks save many of the costs involved in issuing text messages
- Can significantly increase telecom companies' 3G/3.5G subscribers
- Gives credit card users a feasible way to avoid credit card fraud

ITRI
Industrial Technology
Research Institute

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**Meet the
Regional
Experts**

Photo: Taipei city sky-
line at night with view
over Taipei Financial
Center and CBD of
Taiwans capital city.
© Holger Mette

The Region **Taiwan**

Taiwan, also known as Formosa (meaning "beautiful"), is located near the southeastern coast of China. Not particularly big in size,Taiwan's pivotal geographic location and excellent infrastructure nevertheless offer an optimal strategic transit point for multinational companies seeking to enter the Asian market.

Thanks to its innovative management and an extraordinary strong backbone of SMEs, Taiwan became a knowledge-based economy in the 90's. Today Taiwan is home to uncountable high-tech necessities of a modern man-notebook pc, digital camera, mobile phone, MP3 etc. Taiwan is a key player in semiconductor, electronics and terminal devices. It is also one of the largest manufacturers of GNSS products. Taiwan is gearing up efforts to further strengthen that position, among others, by joining ESNC and forming a research alliance of the complete navigation industry chain to promote services and applications.
www.taiwan.net.tw

The regional organiser ITRI

ITRI is Taiwan's leading research institute for technology advancement. ITRI is a non-profit R&D organization financed in equal measure by Taiwan's Ministry of Economic Affairs and the industry. Since its inception in 1973, ITRI has functioned as an incubator for many of Taiwan's industries, including microelectronics and ICT. ITRI has hosted over 300 start-ups since it began its incubation program and opened labs in 1996. In recent years, ITRI has evolved from a technology developer into a value creator. With over 30 companies delivering GNSS products worldwide, Taiwan is one of the most important contributors to the industry. ITRI's rich incubation experiences, coupled with Taiwan's unique strength in commercialising R&D results, has made Taiwan a highly attractive place for those seeking turn their entrepreneurial dreams into business realities. **www.itri.org.tw**

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The Finalists
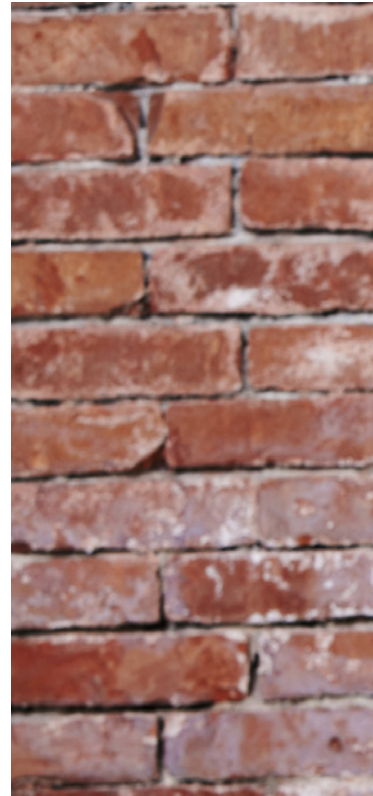
The Winner
Rosemary McClenaghan

The Idea
TaxiZapp – A smartphone & web solution allowing available taxis and potential passengers to connect

DESCRIPTION

TaxiZapp is a taxi hailing application accessed via the Internet or GNSS-enabled smartphones. The application enables potential passengers to locate available taxis registered to the TaxiZapp system in their area. TaxiZapp comprises two components: one for taxi drivers, and one for passengers. Both will be available for download from the TaxiZapp website or app stores. The application is free to passengers, but taxi drivers pay by buying "credits" for a defined number of days' usage.

Potential passengers "hail" a taxi simply by pressing a button within the application and entering their destination and fare details. Through the application, the five nearest taxi drivers receive a message that they have been "hailed" and can view the basic journey details. They then indicate whether they wish to accept this hail – specifying the time it will take to reach the passenger – or they can reject the fare. From drivers who respond to the request, the system determines who is quickest and closest and then allocates the fare.

Only after this allocation are the passenger and driver's full details visible to one another. The allocated taxi driver then drives towards the passenger, who can watch the taxi approach on a map while he or she waits.

Photo: Screenshots showing from left to right log in for drivers, Number of credits available, Incoming hail for taxi.
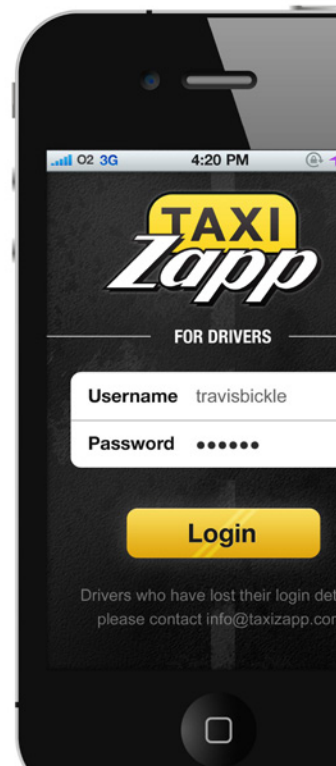
INNOVATION

TaxiZapp utilises GNSS capabilities within smartphones to geo-locate both passengers and taxi drivers, then uses geo-spatial calculations to match the nearest drivers to passengers requesting a taxi. When a passenger "hails" a taxi, their geo-coordinates are sent to the TaxiZapp servers. A list of the nearest points of interest and street names is returned to the user, who confirms his or her exact location. To achieve this, two different databases are accessed, ensuring an accurate match of geo-coordinates to postcodes. The driver's location is also tracked and regularly updated, permitting its display on a map.

TARGET MARKET

The drivers' application is intended for use by both independent taxi drivers and taxi companies as a new method of marketing and an additional means of service management; a white label version is also available to taxi companies. The passenger application, meanwhile will appeal to those between 16 and 50 years of age. It is mainly designed for those who wish to hail taxis for immediate use, but a booking option will be available. The applications have worldwide potential, but Europe will be the focus of our marketing efforts, which will commence with a UK roll out in autumn 2010.
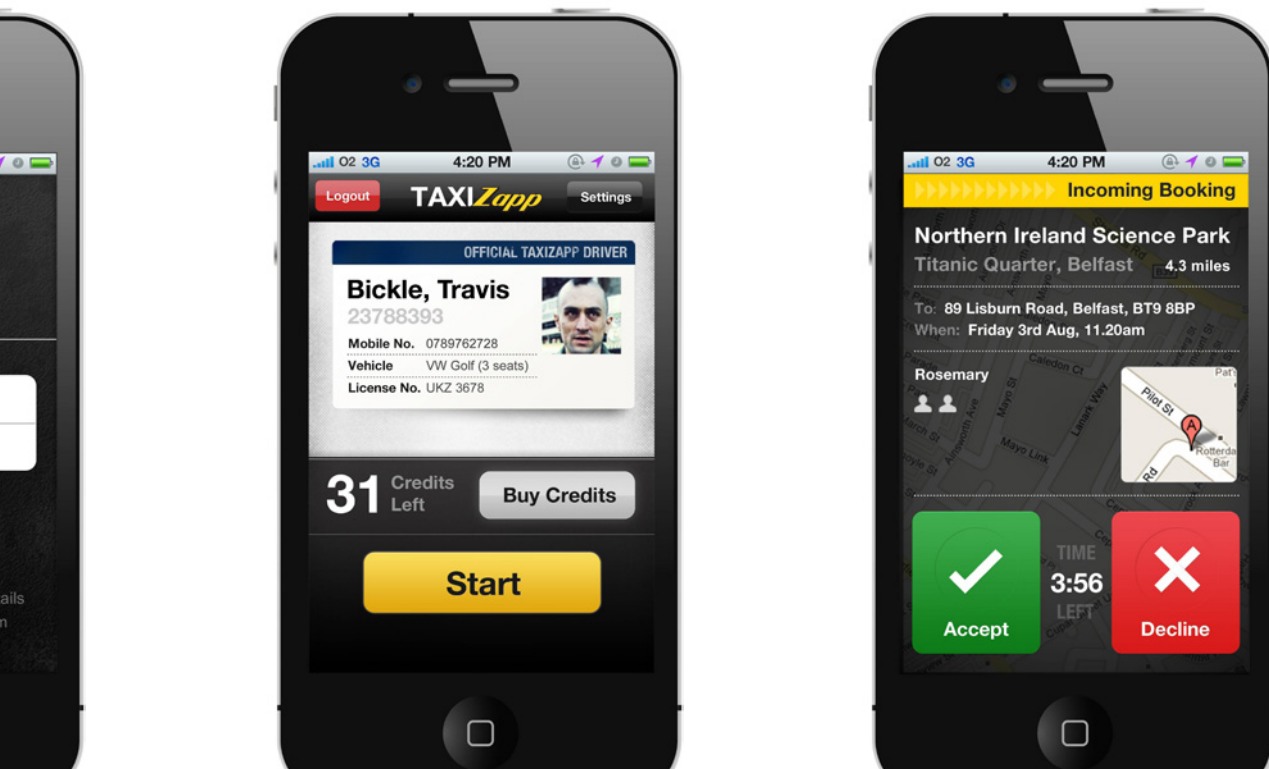
CUSTOMER BENEFIT

Taxi drivers:

- Pay-as-you-go system;
  credits refunded if no fares
- Fewer "empty" miles leads to fuel savings
- Passenger details supplied
- Instant availability for work following login;
  control over working hours
- Record of work
- Europe-wide brand

Passenger benefits:

- Quick access to nearest available taxi
- Record of all journeys undertaken, address book for storing locations
- Details of driver and vehicle supplied, can be forwarded to a nominated person
- Favourite drivers list
- One application can be used Europe-wide
- No speech required

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Photo: A worm's-eye view of the office buildings in London center, financial district.
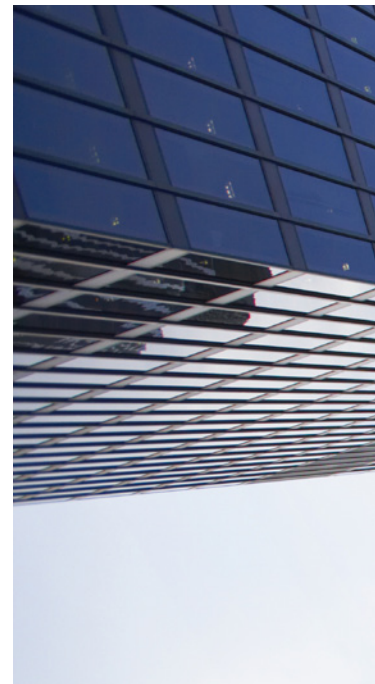
The Region United Kingdom & Ireland

The UK provides the best environment for companies to grow and succeed in international markets by offering a global gateway of connections. It is a recognised leader in the field of innovation and creativity and is the fifth-largest economy in the world. The UK aerospace industry, meanwhile, is the second-largest in the world. It is at the heart of the country's manufacturing base and is a national showcase for wide-ranging technical, managerial, and process-related capabilities. Aerospace is one of the UK's highest value-adding sectors in manufacturing, directly employing 101,000 and supporting 230,000 jobs across the economy.

The East Midlands is England's fourth-largest region, positioned right in the middle of the country. It boasts world-class attractions such as the Peak District National Park, Sherwood Forest, Lincoln Cathedral, Chatsworth House, the Silverstone motor racing circuit, and the National Space Centre. The East Midlands economy is diverse, with world-leading companies in markets including electronics, engineering, pharmaceuticals, and foods and beverages. The UK is home to eight leading universities, among them the University of Nottingham, which itself features the GNSS Research and Applications Centre of Excellence (GRACE).

The regional organiser **The University of Nottingham | GRACE**

The University of Nottingham has joined forces with the East Midlands Development Agency (emda) to create a new, world-class centre of excellence in Global Navigation Satellite Systems (GNSS) with a total investment of £9.2m. The Nottingham Geospatial Building (NGB), the home of the GNSS Research and Applications Centre of Excellence (GRACE) opened its doors on 21 October 2009.

GRACE is part of the University of Nottingham's Institute of Engineering Surveying and Space Geodesy (IESSG), an internationally recognised centre of excellence in surveying, positioning, and navigation technologies. It focuses on helping organisations, businesses, start-ups, and entrepreneurs to take advantage of satellite navigation, positioning, timing, and location-based technologies. We provide business support, consultancy services, training, and testing for the exploitation of new ideas and the creation of new business opportunities. By offering a portal for sharing ideas, engaging with people, and learning about new technologies, GRACE serves as a hub for the GNSS community and beyond.

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REGIONAL WINNER
USA

Video
4th place

The Winner
Elliot Klein

The Idea
eVOTZ Secure Mobile Voting

DESCRIPTION

eVOTZ™ is an interactive, authenticated, private, and location-aware application that impacts society by leveraging the incredible growth of mobile devices – and the corresponding geo-location and mobile positioning services – to enable simple, trustworthy, and secure voting and polling.

eVOTZ presents near-infinite possibilities, ranging from government elections to stockholder proxies and other authorised response-based processes – all of them seamless and with verifiable results. The secure platform authenticates votes from any position-based mobile device. With the proliferation of location-based services around the world, the eVOTZ platform represents a dynamic improvement in these processes by extending the latest GNSS authentication and verification applications for trustworthy voting. This is accomplished by applying localisation in combination with other SIM card identification and security elements, transforming any mobile device into a secure voting, polling, and feedback machine.

Photo: Right place,
right time mobile voting
on any device screen.

**About the
Company**

**About the
Innovator**

INNOVATION

With the secure eVOTZ mobile voting and polling solution, people can take
the burgeoning power of technology, mobile connectivity, social media, and
involvement to the next level to make an impact – in their own lives, commu-
nities, countries, businesses, governments ... and throughout the world. With
eVOTZ, people's voices can truly be heard. By combining cloud computing,
GPS location-based services, and SIM card technologies, eVOTZ transforms
mobile devices into trustworthy voting machines for any election or SMS pol-
ling process.

TARGET MARKET

eVOTZ aids activities ranging from election processes around the world to
corporate governance measures in business and providing countless re-
sponse-based election and polling areas with trustworthy results. The eVOTZ
secure mobile platform represents an innovation beyond traditional voting
and polling measures, showcasing geo-location capabilities that deliver a
new mass-market solution for the greater social good. In established envi-
ronments, eVOTZ improves on paper-based voting processes with a sustain-
able and convenient mechanism for voicing opinions and being counted.

CUSTOMER BENEFIT

By leveraging the widespread adoption of mobile devices, eVOTZ addresses the voting, polling, and response-based needs of consumers, businesses, and governments to improve lives and empower millions. eVOTZ places social, business, and citizen impact back into the hands of the people in a convenient, secure, and easy way. eVOTZ is both scalable and extensible, allowing more people to get involved in a variety of environments – from communities to board rooms. eVOTZ makes voting and polling accessible and sustainable while reducing issues with corruption and accessibility by applying positioning verification technologies.

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Photo: Global Position-
ing Systems operations
at Schriever Air Force
Base in Colorado
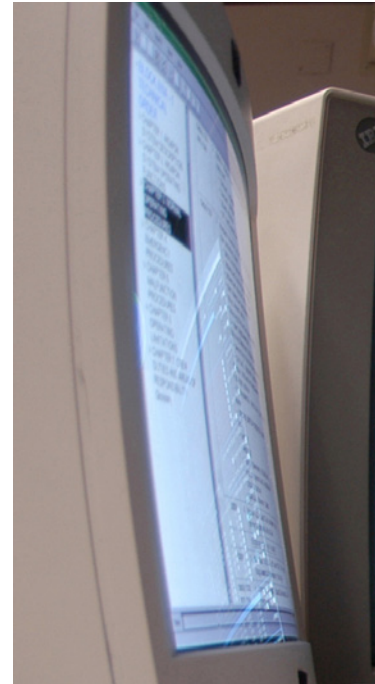
The Region USA

The United States researched, developed, and put into operation the world's first – and still the only – fully operational Global Navigation Satellite System (GNSS): the Global Positioning System.

The United States and Canada are home to key GNSS industries and research centres, including NovAtel, co-sponsor (with Inside GNSS) of the USA Challenge; and the University of Calgary Position, Location, and Navigation (PLAN) Group, which contributed to the regional award.

The regional organiser **Inside GNSS**

Inside GNSS magazine covers the policies, programmes, engineering, and most challenging applications of the Global Navigation Satellite Systems: GPS, Galileo, GLONASS, Compass/ Beidou, and related technologies.

Published eight times a year by Gibbons Media & Research LLC for an international audience of more than 35,000 system developers, product designers and manufacturers, engineers, researchers, and policymakers, Inside GNSS also offers a full digital version of the magazine, the monthly GNSS SIGNALS e-newsletter, and a website that receives about 30,000 visits per month.

InsideGNSS
GPS|GALILEO|GLONASS|COMPASS

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REGIONAL WINNER
VALENCIA / SPAIN

The Winners

**Angel Martinez-Cavero | Miguel-Ángel Llorente-Carmona |
Juan-Pablo Lázaro-Ramos**

The Idea

**ADRIANA: ADvanced RIsk Alerts in a
Social Network Application**

DESCRIPTION

We have recently witnessed a large number of natural disasters and other environmental catastrophes that unfortunately have shown how hard it is for government agencies to coordinate and manage all the tasks necessary to minimise the potential risks to people in such situations.

The aim of this system is to provide an efficient and low-cost tool that enables police and fire departments, civil defence forces, and other public authorities to alert the population quickly to unexpected natural catastrophes.

This idea is based on a social network that users can access from anywhere at no cost, and several compatible plug-ins – including a map client through which public authorities can define risks and hazards in a graphical format. When an alarm is received from any available communication network, the government agency responsible for managing it marks the area on the digital map, thus displaying the number of users that must be evacuated from the hazard zone in short order.

**About the
Company**

INNOVATION

The system exploits GNSS location capabilities and the universal availability of information through communications networks to improve the traditional action protocol followed by government agencies in the event of natural and other environmental catastrophes.

The main features of the ADRIANA system include the ability to:

- Inform as many people as possible in short order
- Define potential risk areas for different kinds of users
- Establish direct contact with people in emergency situations
- Identify user profiles

TARGET MARKET

The ADRIANA system is specifically designed to help municipalities and entire countries improve their citizens' safety when outside the home. It also means to provide an efficient and low-cost way to modify the traditional action protocol used by public authorities to address unexpected natural or other environmental catastrophes. With this system, we are expanding the range of potential operations and introducing a new dimension in rapid response and medical assistance thanks to the ability to ascertain users' locations.

CUSTOMER BENEFIT

The main advantage of this system is its universal accessibility. Any user who is outside home can use the service and will be benefit from its enormous advantages.

ADRIANA can save public administrations significant costs with its ability to alert people in dangerous areas, which can eliminate the need for search operations. If a rescue operation proves necessary, ADRIANA instantly locates the users in danger, reducing the risk of an unsuccessful rescue.

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Photo: The City of Arts and Sciences was designed by Valencia born architect Santiago Calatrava. The impressive architectural ensemble is a unique complex devoted to scientific and cultural dissemination.

The Region Valencia

The Valencian Community is an Autonomous Community located in central and southeastern Spain. It is divided into three provinces, from south to north: Alicante, Valencia and Castellón. It has 518 km of Mediterranean coastline and its 23,259 km² of land are home to 5.02 million inhabitants (2008). The high concentration of companies manufacturing materials and components in the Valencian industry has evolved with the incorporation of new technologies and expertise, which in turn has led to the emergence of a productive and highly specialised intensive research sector increasingly oriented toward the aeronautical-aerospace business. This is evidenced by the regional government's investment policies in research and development, currently estimated to total €1.3 billion in 2009. The R&D landscape of the Valencian Community is formed by three main players:

- The Universidad Politécnica de Valencia (UPV),

- The Valencian Community Network of Research & Development Institutes (REDIT),

- The Valencian Community Aerospace Cluster.

The regional organiser IMPIVA - Generalitat Valencia

Through IMPIVA, the Regional Ministry of Industry, Commerce and Innovation reinforces its commitment to innovation and the development of new technologies and resources in order to improve enterprise competitiveness.

The Valencian Institute of Small and Medium-Sized Industry (IMPIVA) is a public entity of the regional government of Valencia (Generalitat Valenciana) that is responsible for the implementation of its industrial promotion policy in the sphere of small and medium-sized enterprises. It was created in 1984 as an initiative of the Regional Ministry of Industry, Commerce and Innovation. The aim of IMPIVA is to drive the process of innovation in the industries and enterprises of the Valencian region as a fundamental strategy for enhancing competitiveness.In order to fulfil this objective, IMPIVA offers a series of services and annual action plans to support industrial SMEs while promoting a network of technical support infrastructures for innovation. This network consists of Technological Institutes and European Business Innovation Centers (BICSs), locally known as CEEIs.

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Thibault Rufas	Grand Dax
Aymeric Vincent	LaBRI
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Eng. Mohamed Elkady	Arab Aeronautical Association (AAA)
Dr Mohamed Amal	NaviSat
Prof Mohamed Argoun	Cairo University - Egypt

Australia

Matt Higgins	IGNSS Society
Prof Chris Rizos	University of New South Wales
Peter Allison	i.lab incubator Pty Ltd

Baden Württemberg / Germany

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Dr Stefan Engelhard	Industrie- und Handelskammer Reutlingen
Prof Dr Dieter Fritsch	Universität Stuttgart Institute for Photogrammetry
Dieter Geiger	Siemens AG
Stefan Hellfeld	Forum SatNav MIT BW
Ralph Zimmermann	Wirtschaftsministerium Baden-Württemberg
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Martin Grzebellus	NavCert GmbH
Rolf Adam	Cisco Systems GmbH
Markus Bachleitner	ADAC e.V.
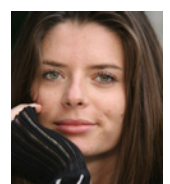
Brazil

Emerson Granemann	MundoGEO
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Carlos Felsky	LACTEC
Prof João Francisco Galera	GEGE / UNESP

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Dr Jesus Marcos Olaya	Inasmet- Tecnalia
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Prof Dr John M. Dow	ESA / ESOC
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Antonio Bianco	Navigate Consortium
Alberto Tuozzi	Italian Space Agency (ASI)

THE EXPERTS

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Aitor Álvarez-Rodríguez	Aena
Néstor Zarraoa	GMV
Daniel de la Sota	CEIM / Madrid
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Oliver Chavrier	Pôle Solutions Communicantes Sécurisées
Jean-Yves Courtois	Orolia
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Andre Labat	Incubateur regional PACA EST
Juliette Marais	INRETS
Laurent Lapchin	INRA

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Harry Evers	ITS Niedersachsen GmbH
Matthias Brucke	OFFIS e. V.
Dr Peter Heller	Innovationszentrum Niedersachsen

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Prof Dr Joachim Bahndorf	Fachhochschule Bielefeld
Prof Dr Bernd Dachwald	Fachhochschule Aachen
Monika Rech	GIS.BUSINESS

Øresund / Denmark & Sweden

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Carsten Jorgensen	Terma
Prof Per Hoeg	Technical University of Denmark
Lambert Spannenburg	Lund University
Lars Montelius	Øresund Science Region
John Jacobsen	Danish Innovation Center
Gustaf Särner	Awapatent AB
Sladjan Bogojevic	Sony Ericsson Mobile Communications AB
David Stray Jørgensen	5te

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Jirí Válek	Czech Ministry of Transport
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South Holland / The Netherlands

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Rob van den Berg	TomTom
Cornelis J.J. Eldering	European Space Agency (ESA)
Jeroen Glazener	Netherlands Space Office (NSO)
Prof Dr Bernhard Katzy	University Bw Munich & Leiden University
Rob Postema	Logica
Peter Reffeltrath	Kennisalliantie
Hans van Vliet	TNO

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Dr Urs Althaus	ams management services GmbH
Prof Dr Heinz Mathis	HSR Hochschule für Technik Rapperswil

Taipei / Taiwan

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Dr Wen-Hsin Chan	Department of Industrial Technology, Ministry of Economic Affairs
William Chou	dmobile System Co., Ltd.
Prof Tzu-How Chu	National Taiwan University
Jimmy Huang	EverMore Technology Inc.
Leon Jian	Maction Technologies, Inc.
Dr C. K. Lee	Institute for Information Industry
Dr Herb Lin	Industrial Technology Investment Corporation
Prof Yi-Bing Lin	National Chiao Tung University
Mu-Piao Shih	Chunghwa Telecom Co., Ltd.
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Dr Shiaw-Shian Yu	Industrial Technology Research Institute (ITRI)

THE EXPERTS

United Kingdom & Ireland

Stuart Martin	Logica
Chris Bee	STFC
Martin Ditter	European Space Agency (ESA)
Clive da la Fuente	Location and Timing Knowledge Transfer Network
Tim Just	TSB (Technology Strategy Board)
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Prof Terry Moore	GRACE & University of Nottingham
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Ann Sta	Department for Transport

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Ralph Eschenbach	Sand Hill Angels
Grace Gao	Stanford GPS Lab
Glen Gibbons	Inside GNSS magazine
Hans Kunze	Inside GNSS magazine
Gerard Lachapelle	University of Calgary
Chris Wilson	TeleAtlas

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Fernando Aparicio	Asociación ITACA
Vicente Boria	Technical University of Valencia
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Carmen Marcos Méndez	IMPIVA
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THE EXPERT TEAMS – SPECIAL TOPIC PRIZES

European GNSS Agency (GSA)

Boris Kennes	European GNSS Agency (GSA)
Carmen Aguilera	European GNSS Agency (GSA)
Phillipe Hamet	European Commission
Cedric Seynat	European Commission

T-Systems

Jurry de la Mar	T-Systems International GmbH
Dr Thomas Beer	European Space Agency (ESA)
Prof Dr Axel Küpper	Technische Universität Berlin
Thomas Leiber	T-Systems International GmbH
Jan Ortlepp	T-Systems International GmbH
Bernhard P. Ruff	T-Systems International GmbH
Roland Schwaiger	Deutsche Telekom AG - T-Labs
Sascha Steiner	T-Systems International GmbH

European Space Agency (ESA)

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Koen DeBeule	European Space Agency
Cornelis J.J. Eldering	European Space Agency
Herve Joumier	European Space Agency
Callum Norrie	European Space Agency
Frank M. Salzgeber	European Space Agency
Javier Ventura-Traveset	European Space Agency

German Aerospace Center (DLR)

Dr Rolf-Dieter Fischer	German Aerospace Center (DLR)
Dr Dennis Göge	German Aerospace Center (DLR)
Robert Klarner	German Aerospace Center (DLR)
Dr Michael Meurer	German Aerospace Center (DLR)
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Dr Klaus-Dieter Rockwitz	German Aerospace Center (DLR)
Dr Ulrich Theis	DLR Space Agency

NAVTEQ

Marc Naddell	NAVTEQ
Steven Si	NAVTEQ
Tom Tierney	NAVTEQ

Forum SatNav MIT BW

Dr Rolf-Jürgen Ahlers	ASG Luftfahrttechnik und Sensorik GmbH Aerospace Forum Baden-Württemberg (LRBW)
Dieter Geiger	Siemens AG
Stefan Hellfeld	FZI Forschungszentrum Informatik
Ralph Zimmermann	Ministry of Economics Baden-Württemberg

GNSS Living Lab Prize

Roberto Santoro	European Network of Living Lab (ENoLL)
Prof Dr Pieter Ballon	IBBT-iLab.o
Dr Klaus Enßlin	DKE Aerospace
Boris Kennes	European GNSS Supervisory Authority (GSA)
Veli-Pekka Niitamo	
Jean-Yves Roger	European Commission
Dr Carsten Rudolph	Munich Business Plan Competition (MBPW)
Artur Serra	
Claudio Vandi	LUTIN Userlab

University Challenge

Stefano Scarda	European Commission
Michel Bosco	European Commission
Fabio Dovis	Politecnico di Torino
Dr Daniel Ludwig	DLC-Grand Toulouse-France
Gustaf Särner	Awapatent AB

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