SUCCESS STORIES

EUROPEAN SATELLITE NAVIGATION **COMPETITION 2004–2010**

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www.galileo-masters.eu

© creative workline/Tourality

›› Tourality

A new type of game for mobile phones combining sporty outdoor activities with a virtual location-based gaming experience as singleplayer, hand to hand or in team vs team mode. **page 2**

© GMV

›› Osmógrafo

Combining GNSS positioning and wind measurements to map the area covered by search-and-rescue dogs' sense of smell in real-time is invaluable help to rescue coordination. **page 3**

›› Atmosphere

Complementing space and ground observation systems for massive improvement of weather forecasting and Global Monitoring for Environment and Security (GMES) objectives. **page 3**

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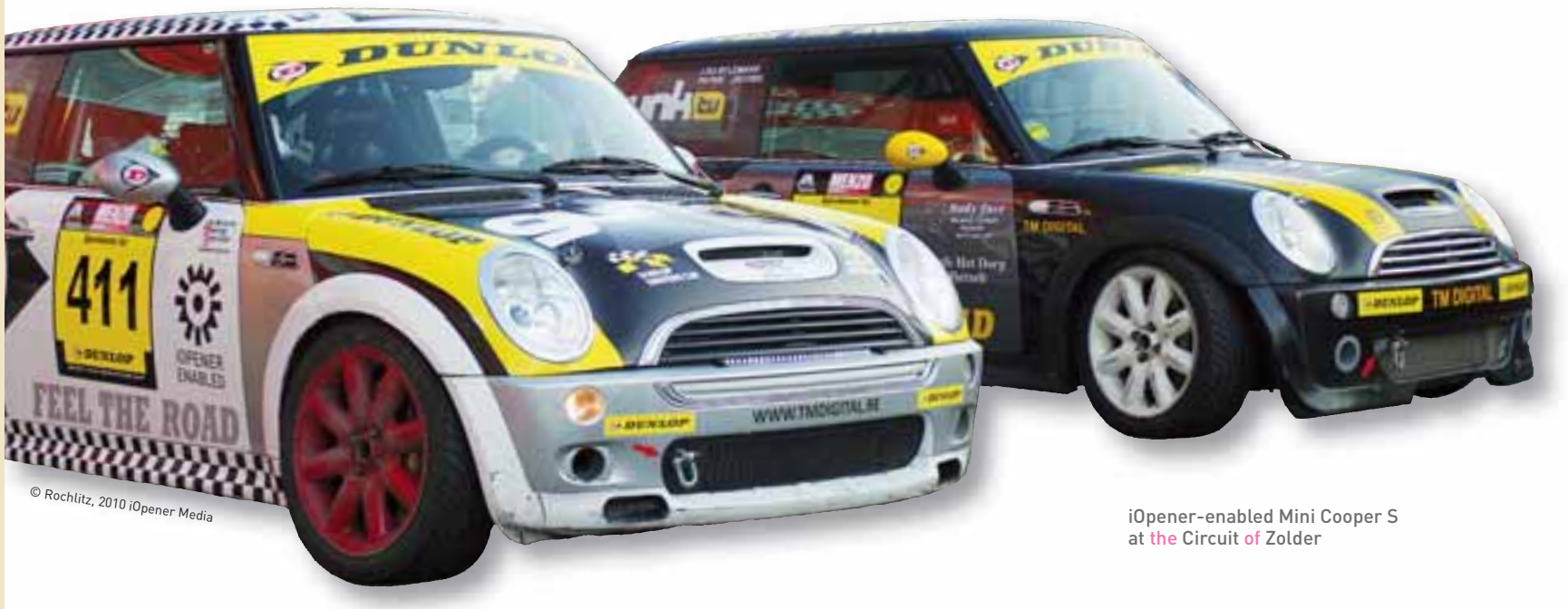
›› Avalanche Rescue Navigator

Combining existing GNSS and Galileo state-of-the-art localisation system ARN is able to reduce searching time for avalanche victims by up to 40 per cent. **page 4**

Motorsport Meets GNSS Technology

Already 20,000 beta-testers for real-time racing



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iOpener-enabled Mini Cooper S at the Circuit of Zolder

In 2007, iOpener – Dutch regional finalist of 2006 – successfully participated in the European Space Agency Business Incubation initiative, securing an investment of € 4.1 million from the Triangle Venture Capital group. In the meantime, iOpener – now headquartered in Aachen, Germany – has grown into a company with more than 20 employees while developed the patented iOpener-enabled feature into a commercial product.

With the help of GNSS, iOpener transmits live telemetry data from race cars into a virtual racing environment, making it possible for gamers to experience racing in real-time, on real tracks, and against real opponents driving real cars. The first iOpener-enabled product is Real-Time Racing, a game currently in beta testing with more than 20,000 registered participants. In addition to the entertainment industry, the iOpener-enabled feature will also have a role in motorsport talent scouting and safety control.

iOpener is now ramping up its operations to work with major race series and tracks, with the World Rally Championship race series and the Sepang International Circuit already signed on. Even more challenging race series are to follow in the forseeable future.

www.iopenermedia.com
www.real-timeracing.com

Dear reader.

What began in the Free State of Bavaria in 2004 has since matured into a truly unique global network of innovation and expertise. This network is geared toward industry requirements and, along with 20 partner regions, supports rapid realisation of the many product and service innovations produced by the European Satellite Navigation Competition (ESNC).

Over the last six years, almost 1,500 innovators have participated in the ESNC. Satellite navigation has optimised a lot of industry sectors, from traditional areas such as transport and logistics to more specialised areas like high-precision agriculture, security, green tech, healthcare, and the virtually limitless field of location-based services.

A network of 150 experts evaluates the proposals submitted each year. Their decisions have resulted in the foundation of countless start-ups, R&D projects funded at various levels, B2B product developments between SMEs, and lead ventures.

By presenting a selection of ideas awarded in the last six years, this edition of "Success Stories" shows how winners can benefit from participation.

Sincerely,

Thorsten Rudolph
CEO, Anwendungszentrum GmbH
Oberpfaffenhofen

Scouting for Race Talents

In recent months, real race drivers have been challenged in the virtual environment of the game Real Time Racing (RTR), which features the technology iOpener. Now virtual drivers have the chance to get a real official race license supported by Skylimit Events, get behind the wheel of a real Dunlop Mini Cooper S, and take on gamers in the upcoming iOpener-enabled races on the circuit of Zolder.

"We hope that with this great initiative, the fans and testers of the iOpener-enabled game RTR can make their dream of becoming real race-car drivers come true," says Andy Lürling, CEO of iOpener. "One of our goals with iOpener is to give talented racing gamers a platform to test themselves against the best real-life drivers. Getting a free race license is the first step to what might result in a big racing career."

Andy Jaenen of the Belgium-based Skylimit Events commented: "We believe that there is a big pool of undiscovered racing talent in the racing sim community. By giving virtual racers decent driver training and a real racing license, we're supporting the philosophy behind RTR and the iOpener-enabled feature."

www.real-timeracing.com

Using Images as Search Terms

Object recognition related to location

In the year 2007 SUPERWISE Technologies AG already presented a workable concept for identifying and searching for content using an image as a search term as regional winner of ESNC Bavaria. There's actually a wide range of applications for such technology, from leisure and personal devices to medical applications and security.

The Apollo system is able to identify not only architectural objects, but any objects – even in medical and health/spa applications. It is particularly powerful when combined with GPS data, which enables very high reliability in both object recognition and location-based services.

In an emergency involving a person who has fallen down, for example, an alarm is triggered and the system transmits positioning data to ensure quick aid.

The technology has also been adapted to video recognition and is currently being prepared for use with media archives. While interest in applications on smartphones has not yet met expectations, the system's position as a universal platform for medical, nutritional, and other wellness applications, remains excellent.

www.superwise-technologies.com

Tourality – Move Your Mobile!

A multiplayer virtual gaming experience

Tourality by creative workline is a multiplayer location-based game for mobile phones that combines sporty outdoor activity with a virtual gaming experience. Shortly after its successful participation in ESNC 2008, the project Tourality was accepted at the build! academic startup centre. build! is a publicly funded incubator in Klagenfurt, Austria, that supports start-ups during their initial 1.5 years. Since then, the team has been striving to make Tourality the number-one action-oriented location-based game. In addition to working on exciting new features and improving the end-user experience, they are developing B2B features that will make the game an interesting new marketing tool for white-label customers and advertising campaigns. Currently the team's focus is also on bringing the game to new mobile platforms like iPhone and Android. In addition to other accolades, Tourality won third place in the Austrian i2b & GO! Business Plan Competition 2008 and was featured in an episode of "The Gadget Show" on Channel Five in UK television in early 2009. http://tourality.com

© Channel 5 Broadcasting Ltd.

Team-vs-team mode enables up to 40 players at the same time.

Mobile Operation Control Systems

For intelligent delivery and mobile reporting

In 2003, COPTIMAL LOGICS INC. of Taiwan, started providing solutions developed with a focus on optimisation, visualisation, and automation in the logistics industry. With AutoDispatch now they have developed a one-of-a-kind solution.

This solution is able to consider various complicated dispatch constraints in automatically selecting the most economic delivery vehicle (by weight, capacity, type, and so on), determining the delivery sequence of various customer sites, and planning optimised routing. COPTIMAL also utilises Windows Mobile devices to pass delivery orders to vehicles on the road, which lends its mobile management improved just-in-time functionality and the ability to accurately trace both vehicle locations and the delivery status of shipments. In addition, AutoDispatch compares whether item IDs and quantities match their respective orders and can register checkpoints at any place and time. The solution also makes tedious written reports a thing of the past, which enhances both dispatching efficiency and security – a primary concern for most customers.

AutoDispatch has successfully gone live at Toll Global Logistics in Shanghai, which has solved problems posed by the various delivery windows clients require and the city's complicated road network. By employing the solution, the company has significantly increased its sales competitiveness and profit while reducing its delivery transportation costs in logistics. AutoDispatch has also found favour with Taiwan Cement Corp., which has implemented the solution and used specific delivery vehicles to deal with environmental logistics regulations. Once an item has been delivered and processed, the company's employees can use a Windows Mobile phone to deliver live images of the shipment's location and status by reports or e-mail. The client thus enjoys better and more environmentally friendly information transparency.

www.coptimal.com

© 2009 COPTIMAL LOGICS INC.

AutoDispatch was the runner-up for Taiwan's regional prize in ESNC 2008.

Advanced Tracking System

ATS seeks to leverage different technologies in providing a valid solution to problems typical of the transport sector and of monitoring systems in general. ATS enables high accuracy tracking using conventional, low-cost GPS receivers. The system reprocesses raw data from the receiver and integrates it with corrections provided by GPS ground stations and the EGNOS system. ATS integrates positional information with data obtained by wireless Zigbee network sensors installed on rovers. The platform also improves the security of transmitted information and provides a calibrated ionospheric model. Thanks to IREALP (Research Institute for Ecology and Economy, Alpine Areas), since 2007, ATS has been a key component of the Lombardy Region's S.I.T.T. project, wich involves an informative system for collecting, managing and controlling waste transport in the region.

www.allix.it

A Clock on a Chip

Dimension4 is a solid-state atomic clock company that intends to bring the first atomic clock on a chip to the telecom and GPS markets. D4's proprietary solid-state atomic clock is based on energy transition in solid material rather than gas, which generates a highly accurate frequency signal. D4's clock creates accurate oscillations much in the manner of a clock pendulum, but fits the entire "atomic" pendulum on a silicon chip. Currently, the company is looking to secure private investment after completing its first investment round from Galileo programme.

D4 is at the end of its initial research stage and has begun developing the first generation of its atomic clock. The company's goal for the coming year is to complete its first-generation product and demonstrate its capabilities; in the long term, meanwhile, D4 intends to release its first product within three to four years.

© Dimension4

SSAC – Solid-State Atomic Clock on a silicon CMOS chip

Computerised Freighter Berthing

Port operations for the future

Computerised freighter berthing (CFB) has obvious advantages for global port management, as it improves safety and productivity.

Last-minute unexpected twists aside, most of the data needed to plan and implement cargo transportation by sea can be computerised with existing devices and databases

As far as positioning is concerned, GNSS positioning technology (Galileo and EGNOS) will enable us to pinpoint precisely both the positions and physical characteristics of arriving ships, as well as the port, docks, and ships docked or in motion – all in 3-D.

This idea won the regional first prize for Gipuzkoa (Basque Country), Spain, and was the runner-up for the special topic prize awarded by the German Aerospace Center (DLR) in 2009. Isaski, the company behind the idea continues to receive support from a local incubator (BicBerrilan) in the form of consulting, meeting rooms, workstations, specialists, and public agencies for the development of this specific idea and of the company in general. Isaski is also in contact with DLR to find means of developing the idea, including research packages, DLR expertise, and opportunities to use its simulation facilities. Last but not least Isaski is in talks with the pilots of the port of Pasaia (also in the Gipuzkoa region) to incorporate their expertise and find venues for developing the idea.

www.isaski.com

© fotolia/Flying-Tiger

Computerised freighter berthing optimises port operations.

Wind, Dogs & GNSS

Wind measurement and positioning to determine the area covered by search-and-rescue dogs

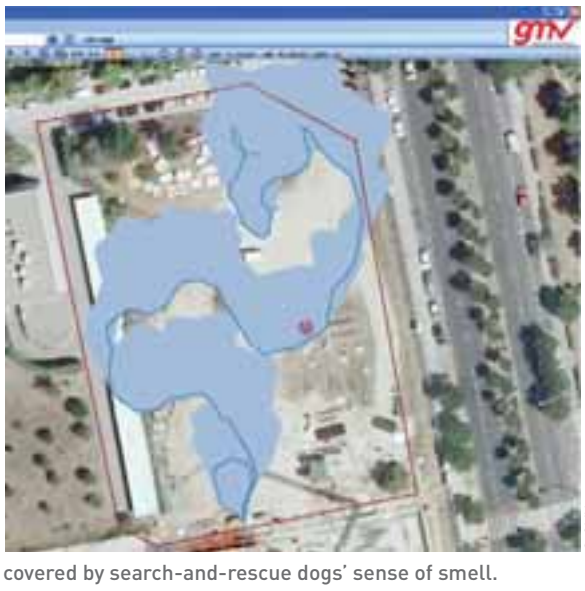
Osmógrafo, the 2009 GALILEO Master, is an innovative product that combines GNSS positioning and wind measurements to map the area covered by search-and-rescue dogs' sense of smell in real-time. This is an invaluable help to rescue coordinators seeking to determine if there are areas yet to be searched before leaving a zone.

Osmógrafo consists of GPS dog collars, a wind sensor, wireless communication functionality, and a central unit with a dedicated application supporting the search-and-rescue process.

After the patent for the invention was filed, development of Osmógrafo started in mid-2007. The first operational version was presented in September 2009. In the last quarter of 2009, Osmógrafo was shown to several search-and-rescue organisations; the solution was very well received and garnered valuable comments on potential improvements. Most of the suggestions referred to the adaptation of the application to make it suitable for searches in large areas.

Osmógrafo was also one of the technologies shown recently in the European Commission's FP6 project MAGES, which is devoted to fostering the use of GNSS solutions in emergency management.

Winning the GALILEO Masters award in October 2009 has brought important publicity to both the product and its creator (GMV), which in turn has made it easier for the Spanish company to approach potential customers and partners. Currently, the GMV team is working to implement a second version of the equipment with improved communications. Meanwhile, the company is in conversations with some organisations interested in purchasing Osmógrafo. www.gmv.com



© GMV

Dog and volunteer from the NGO IAE in order to map the area covered by search-and-rescue dogs' sense of smell.

Global Real-Time Positioning at the Centimeter Level

Today, high-accuracy (1-100 mm) GNSS work is mainly a field for universities and other scientific institutes; in tomorrow's business world, however, this will be a field for highly specialised commercial companies.
The company PosiTim, winner of Hessen's regional prize and the ESA special topic prize 2009 mainly aims at commercially exploiting the enormous capabilities offered by the ESA-owned NAPEOS software package. Its excellent quality and high-speed performance make NAPEOS very well suited for a broad range of high-precision and (near-) real-time GNSS applications. The key focus will be to deliver complete turnkey solutions tailored to the specific needs of customers. As a secondary focus, PosiTim will offer NAPEOS services to customers who want to work with NAPEOS but do not want or require a complete turnkey solution. These services will include basic setup of and training in the NAPEOS software.
www.PosiTim.com

ATMOSPHERE

Collaborative meteo concept for aviation

The project seeks to develop an airborne collaborative network for real-time exchange of atmospheric conditions. Complementing space and ground observation systems, the airborne network will significantly contribute to the improvement of weather forecasting and Global Monitoring for Environment and Security (GMES) objectives.

Deployed in general aviation, it will provide unique capabilities in observing local atmospheric conditions such as wind, temperature, and humidity, as well as human activity. On the ground, the data will be distributed to meteorological agencies, airlines, airports, and scientific research facilities. Improved weather forecasting and aviation-specific products such as condensation trail predictions and fog forecasting on aerodromes will become feasible thanks to the network's high-altitude humidity measurements. The data will also be used for "now-cast" applications, including noise reduction at airports and continuous descent approaches. Further, in times of observed increases in atmospheric turbulence, the collaborative exchange of data between aircraft is an efficient means of improving flight safety.

After winning the Nice/Sophia Antipolis regional ESNC prize and the GMES Masters in 2009, ATMOSPHERE is currently developing the Collaborative Meteo Concept for Aviation through complementary research projects:

- CAPITOLE (started July 2009), sponsored by the French Civil Aviation Authority, which studies the provision of in-flight weather data via IRIS, the future satellite infrastructure developed by ESA for the Single European Sky initiative
- OGC Aviation Test Bed (started Jan 2010), sponsored by the FAA and Eurocontrol. The project goal is to validate the future standard for the exchange of geo-localised weather data (the WXXM standard developed by the Open Geospatial Consortium).
- COMET (started Jan 2010), sponsored by the Clean Sky Joint Undertaking. Led by ATMOSPHERE, this study aims to validate the concept of meteo-data collection as a standard provision on future Airbus aircraft. The validation of customer benefits will be achieved thanks to the extensive involvement of European weather agencies in the project (e-AMDAR).

ATMOSPHERE has also applied to the ESA Business Incubation Centre, where it hopes to further develop its idea within the framework of an integrated application project involving several European partners.
www.atmosphere.aero

Real-Time Rescue – Personal GNSS Tracker

If a person falls from a ship into cold water, time is of the essence in his or her rescue; the fastest method is to get the person back on the vessel in question. The POB (Person Over Board) project exploits a major gap in the marine safety market by combining a crew-overboard alarm and a real-time tracking and retrieval system in a much more effective way.

The two components of this project are a small electronics device worn by each crewmember and a fixed ship unit compatible with and, most importantly, capable of interfacing with existing navigation equipment.

Immersion in water activates the personal crew device (POB), at which point the ship unit logs the device's position and initiates an audio and visual alarm. The crew unit then obtains a GNSS fix in a matter of seconds using aided start-up from the ship and transmits its position at regular intervals. The ship unit starts tracking the POB position and generates instructions for rescue.

Since winning the European Satellite Navigation Competition in 2008 in three categories, the team has built a life-size prototype unit incorporating the working circuit boards and completed software changes necessary to track the casualty, calculate range and bearing, and transfer the output to a cockpit repeater. In addition, other markets such as diving, offshore rigs, and wind farms have been investigated.

Sci-Tech has been demonstrating a working prototype on water at the Galileo Application Village in Brussels on March 3-5.
www.scitechsystems.co.uk

Avalanche Rescue Navigator

In the media and on the mountains

To this day, avalanche victims are located using techniques and searching methods that have been around for decades. Galileo presents a great opportunity to use a state-of-the-art localisation system to optimise the process of finding people buried under snow.

© Fraunhofer IML

Prof Dr Mayr (Hochschule Rosenheim) during first system tests together with the Bavarian mountain service.

Avalanche Rescue Navigator is a next-generation GNSS-based rescue device that leverages accurate localisation in the rapid rescue of avalanche victims. This is achieved using 3D measurements of the flux lines from buried transmitters. The exact location of the measurement is the basis for the location process, the high precision of which is realised by a multi-SatNav system that uses existing GNSS services and Galileo. With this combination of information, an algorithm calculates the position of the victim relative to the ARN user's local position. ARN then provides information on the distance, direction, and has the potential to identify the depth of all detected victims.

Thanks to its high-precision localisation, direct guidance, and improved coordination, the solution can reduce the time required by conventional methods throughout the search process by up to 40%. ARN thus significantly increases the chance of survival. Additional information and warning services are further possible value-adding applications. With the knowledge of the depths of the located victims an optimised rescue sequence is possible.

Furthermore ARN has the intention to transfer the localisation systematic for avalanche beepers onto the identification and localisation of buried mobile phones. There are already research activities running for this subject. Since being selected as the ESNC regional winner for Bavaria in October 2009, ARN has generated high media interest. Several interviews and articles have been published in daily newspapers and trade magazines. A short documentary was even shot for German television.

First tests of the system on a snow-covered mountain side under real-time conditions and in cooperation with the mountain rescue workers are planned at the GATE testbed in Berchtesgaden (Germany). During this tests the entire system will be checked by using the precisely simulated Galileo signals available within GATE.

www.sar-lawine.eu
www.prien.iml.fraunhofer.de
www.protime.de

Topographical Challenges

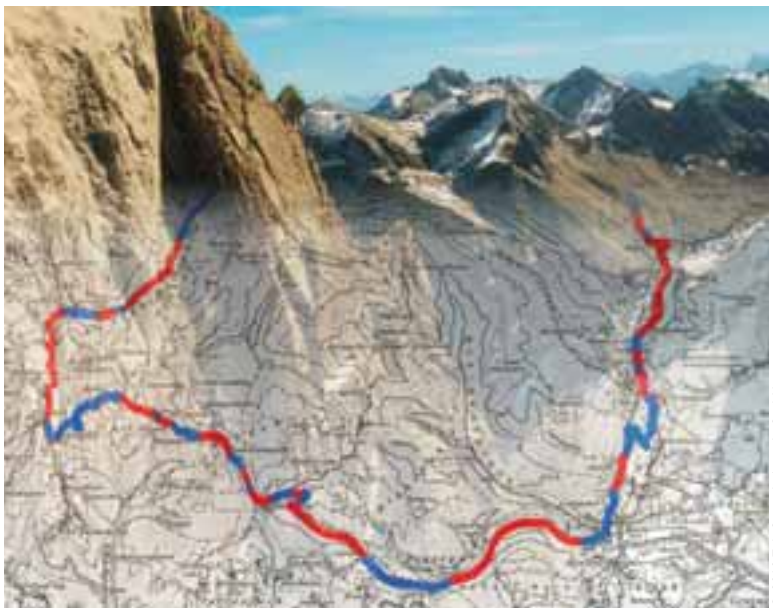
Austrian EGNOS data server

The Austrian EGNOS data server (OEGNOS) provides an EGNOS data-correction service specially tailored to the requirements in Austria, where the challenging topography causes shading of the EGNOS satellite signal. Corrective EGNOS data are decoded and supplemented by local ionospheric and tropospheric corrections, which are based on real-time atmospheric measurements. Finally, the corrective information is encoded into RTCM format and provided via an authenticated terrestrial communication link. The resulting improved absolute accuracy in single-point positioning makes new application areas possible that cannot be covered by conventional GPS/EGNOS positioning in Austria.

The OEGNOS concept can also be applied to any other European region.

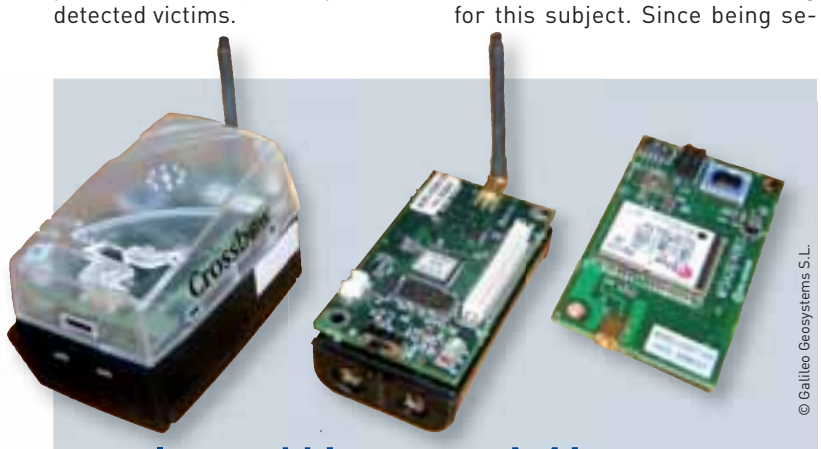
The idea of OEGNOS came second in the GSA special topic prize 2008 and is currently being implemented by TeleConsult Austria in cooperation with the University Centre of Rottenmann, the Space Research Institute of the Austrian Academy of Sciences, and the Institute of Geodesy and Geophysics at the Vienna University of Technology in a project partially funded through the Austrian government and managed by the Austrian Research Promotion Agency. The OEGNOS concept has been used to file an application for a patent, which is currently pending.

www.oegnos.at



© 2010 TeleConsult Austria GmbH

Corrective EGNOS data is helping deal with challenging topography.



© Galileo Geosystems S.L.

Intelligent Micro-sensors for Desaster Monitoring

The successful tandem of microsensor networks and GNSS-EGNOS technologies is likely to enjoy one of the greatest technological and commercial successes in the next decade. Collecting huge amounts of data from an intelligent microsensor network is useless without the means to analyse this information in a spatial way. For most emergency and risk management applications, the microsensor network will rely on the availability of GNSS-EGNOS positioning. These networks consist of electronic devices capable of registering information from the environment in which they have been disseminated, processing it, geo-referencing it using GNSS, and transmitting the data wirelessly to its destination.

One of the most interesting related fields of application is the chronological and spatial tracking of certain physical phenomena, such as temperature, humidity, pH, toxins, brightness, and so on. Typical example applications could include the monitoring of forest fires, harmful emissions, and red/black tides. Initial experiments have met with success, and the idea is undergoing preparation for upcoming R&D programs calls in order to secure funding and continue prototype construction. Contacts with emergencies services (forest fire and hazard control brigades) have been established with the aim of incorporating their requirements and involving them in validation tests.

www.galileogeosystems.com

INPRESOL – Integrated System for Prenatal Monitoring

Ongoing testing with at-risk pregnant women

INPRESOL is an integrated electronic system developed for prenatal monitoring (screening) of pregnant women and subsequent automatic analysis of collected data. It helps medical specialists recognise imminent premature delivery in time. It is suitable for use in both hospitals and outpatient gynecological clinics.

This system of pregnancy risk assessment is based on continuous external tocography and round-the-clock monitoring, recording, and evaluation of pressure fluctuations within the uterus with respect to changes in patient position.

The INPRESOL system features:

- Continuous monitoring of patients with known pregnancy risks by collecting and recording pressure variations within the uterus.
- Creation and maintenance of a central database of all relevant patient and pregnancy data.
- Management of complete pregnancy documentation.
- Transfer of measured data into the central database.
- Automatic analysis of collected data.
- Automatic diagnostics (risk assessment of premature delivery).

© fotolia/digitalhardstock

Having been awarded the Czech regional prize in ESNC 2009, the INPRESOL system has since drawn the attention of many prospective users abroad. The system is currently undergoing a series of tests with a group of at-risk pregnant women at a prominent Czech clinic (Ústav péče o matku a dítě in Prague). A corresponding patent has been filed in the United States, where licensing negotiations are also in progress. The system was developed in close co-operation with the leading European company NXP Semiconductors, which has already delivered 10 GPS/GSM ATOP modules for the prototype series of electronic INPRESOL units. A comprehensive live presentation of the INPRESOL system will take place at the world conference pHealth 2010 workshop in Berlin on May 26–28.

www.icenet.cz

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