

SPACE FOR BUSINESS

ESA'S TECHNOLOGY TRANSFER PROGRAMME NEWSLETTER

ISSUE 1 / 2009



credits: etamax

THE ETAMAX TEAM PRESENTING THEIR MOBILE FLOATERS

BETTER FLOOD PREDICTIONS VIA SATELLITE NAVIGATION TECHNOLOGY

Floods represent a worldwide problem that causes economic and ecological devastation of afflicted regions and claim thousands of lives each year. Worldwide climate change and global warming are likely to raise the number of floods considerably. German start-up company Etamax, incubated in ESA's Technology Transfer Programme's business incubator in ESOC, has developed an innovative mobile flood monitoring system that uses satellite navigation to measure water levels of rivers in near-real time, enabling authorities to react quickly and thus potentially prevent damage.

The extent and occurrence of floods are hard to predict, as most flood measuring methods nowadays lack accurate real-time data of the development of the water levels. Etamax, a German high-tech start-up company supported by ESA's Technology Transfer Programme through its business incubator at the European Space Operations Centre (ESOC) in Darmstadt, Germany, developed an innovative solution to this problem. Etamax's 'G-Wale' system, together with international consultancy and research institution DHI Wasser & Umwelt, considerably improves flood predictions by using Satellite

Navigation. 'G-Wale' is the first mobile water measurement system for rivers that applies global navigation satellite system (GNSS) technologies to report the water level of an endangered river-zone in near real-time.

Holger Sdunnus, CEO of Etamax, was the European Satellite Navigation Competition finalist for Germany's region of Hesse in 2006.

Today's permanently installed water measurement stations are immobile, expensive, need maintenance and are often limited in their measurement range. 'G-Wale' offers a flexible solution for collecting water level measurements: it is mobile, thus can be

ETAMAX MOBILE FLOATERS IN ACTION



credits: ESA

COLOGNE / RHINE - FLOODS
IN DECEMBER 1993



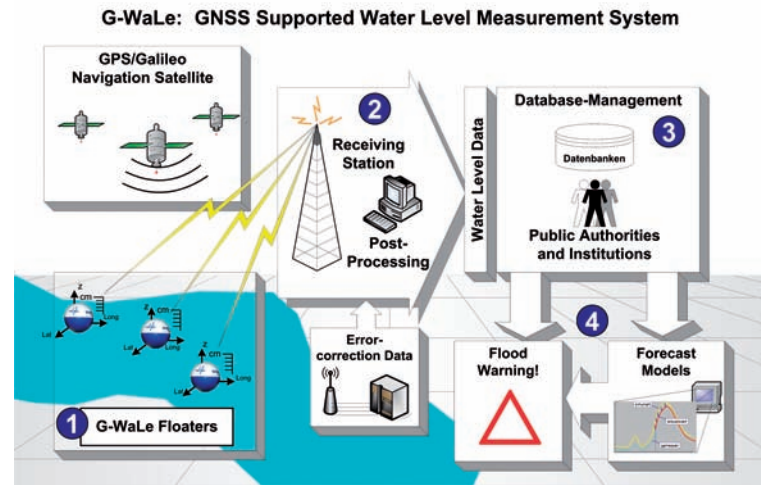
credits: Etamax

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transported to even the remotest regions e.g. of emerging countries, and is operational on very short notice. A set of 'G-WaLe' floaters can be anchored in the river to provide near real-time positioning measurements, which can then be correlated with a fixed reference station to a user data centre. The collected data can be used for a better calibration of river models for preventive flood protection and to support operational forces in the event of a crisis.

The system can be easily dispatched by ground or air transport to an endangered area and can use satellite navigation services and data forwarding via GSM or satellite communication. Potential customers for the 'G-WaLe' are, for instance, water boards, governmental institutions, public authorities responsible for water resources and flood management, industry located at river zones with a need for protection of their installations and insurance companies interested in accurate damage forecasts in flooded areas.



The 'G-WaLe' system has successfully demonstrated the proof of concept through laboratory and real-time testing of the floaters in lakes and rivers. Market entry of the product is expected in 2009.



NO CHANGE FOR HIDDEN GUNS

Security start-up ThruVision, with the help of ESA Technology Transfer Programme Office, transferred space-based ESA-developed terahertz imaging technology into their security device T5000 which makes it possible to screen people for concealed objects without them even noticing.

TERAHERTZ IMAGING TECHNOLOGY

Unlike light, terahertz waves are able to propagate through cloud and smoke providing a powerful advantage for certain remote sensing measurements. From a practical aspect they are also able to pass through windows, paper, clothing and in certain instances even walls. Terahertz imaging technology is already used in astronomy applications to research comets or planets as well as in the field of Earth observation to monitor different properties of our planet, for example to measure and visualize the sea surface temperature. But the terahertz imaging instruments used for space applications are quite costly, as the discrete metal components used are difficult to integrate.

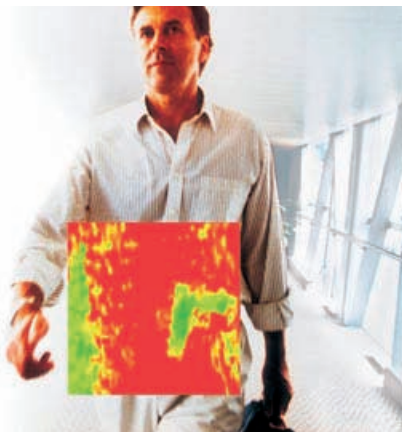
ESA-led project StarTiger implemented a new approach of developing those instruments. A novel methodology - silicon manufacturing - made the technology easier and cheaper to manufacture. No integration is needed - it occurs automatically, as the instrument is manufactured entirely and in one go. This facilitates the creation of arrays. The StarTiger concept of putting together a team of researchers in a distraction-free environment with priority access to facilities and testing devices led to big technology advancement in a very short time and thus made the terahertz technology fit for terrestrial use.

T5000: NOVEL REMOTE SCREENING FOR CONCEALED OBJECTS WITHOUT INVADING PRIVACY

Security start-up ThruVision catapulted the terahertz imaging technology into the commercial world: with the help of ESA's Technology Transfer Programme Office, ThruVision was able to transfer the technology to their passive security screening device T5000.

SECURITY START-UP THRUVISION USES ESA-DEVELOPED SPACE TECHNOLOGY TO SCREEN PASSERS-BY FOR HIDDEN OBJECTS

Since the terrorist attacks on trains in Madrid and London and the last minute prevention of an assault on British planes heading to the USA, security is a number one topic in Europe and all over the world. And it affects us all, as we can tell by the increased security measure at European airports: tightened controls for luggage contents and higher number of body checks are omnipresent. But those means are lengthy, tiresome and far from comprehensive – a drop into the ocean, considering that random sample strip-searches can never be exhaustive.



The T5000 is composed of a camera unit and a remote laptop PC linked to the camera by Ethernet connection. It displays images of concealed objects on stationary and walking subjects at distances up to 25 metres. Concealed object and CCTV images are displayed in real time on the operator's remote notebook PC, which may be any distance from the T5000 camera unit. Usable indoors as well as outdoors, the application opportunities for the T5000 are vast: Border or checkpoint control, airport security or entrance screening for e.g. big events are only some examples of the versatility of the system, which can screen for a wide range of concealed objects such as

explosives, composites, metals, narcotics or liquids.

Another advantage of this terahertz screening technology is the way the images are created: concealed objects are displayed by passively detecting naturally occurring terahertz waves emitted by all people and objects. No anatomical details are revealed in the imaging process - avoiding many regulatory barriers associated with public use.

4.4 Million Euro venture capital

ThruVision's pioneering space-based terahertz imaging system triggered Venture Capitalist Noble Venture Finance to invest 4.4 Million Euro (3.7 Million Pound) into the promising start-up company. According to Andrew Webster, Director at Noble Venture Finance, it was ThruVision's high potential in a breadth of applications of its technology in the rapidly growing security market that attracted the Venture Capitalist to go forward with the investment. ThruVision announced the new finances will be used as working capital for both company and product range expansion.

INNOVATIONS FOR EUROPE THROUGH TECHNOLOGY TRANSFER



Frank Salzgeber, Head of ESA's Technology Transfer Programme, explains how technology transfer uses the impetus of European space technology research to stimulate innovation.

TECHNOLOGY TRANSFER IS A BUZZWORD THAT IS OFTEN USED BUT EVEN MORE OFTEN NOT UNDERSTOOD. WHAT DOES IT MEAN?

Technology transfer is the usage of technology but also most of the time know-how that was developed for one application and – with modifications – is then applied to a completely different one. Often technology transfer is associated with the pure selling of intellectual property rights (IPR), but it is much more. The IPR is not worth a

whole lot without the expertise and experience of the engineer who developed the technology. Knowledge transfer is a big part of the technology transfer progress, which is often underestimated.

The most interesting transfers actually happen between branches of industry and not within an economic sector – say, from automotive to automotive. It is interdisciplinary transfer that generates real innovation.

THE ESA TECHNOLOGY TRANSFER PROGRAMME WANTS TO FOSTER THE TRANSFER OF SPACE TECHNOLOGY IN EUROPEAN INDUSTRY. THAT IS QUITE A BROAD AIM. WHAT DOES IT ENTAIL?

Having a Technology Transfer Programme at the European Space Agency (ESA) means exploiting the efficiency of a system to the maximum. What we do is recycling the technology that was already developed for space to make other industry sectors benefit from it as well.

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Europe, via ESA, is investing a significant amount of money into the development of technology and space systems. We often speak of space technologies in this context, but the correct term is actually 'enabling technologies'. This is quite up-to-date, as lots of industries, like for instance the automotive branch, are looking for light materials, energy efficient systems, and special durable structures.

If you want to make a car more effective in terms of fuel consumption, you can try to modify the engine, but you can also work on the efficiency of embedded systems, on system integration. These are old problems for the space industry, and solutions already have been developed.

HOW CAN SPACE TECH BENEFIT US IN EVERYDAY LIFE?

Innovation and invention are not the same as per definition. Invention may entail lots of money and lots of time spent. Generally speaking, an invention does not always have to be innovative.

An innovation on the other hand can be making use of something that was originally developed for a totally different field. This can be seen in lots of different areas where we applied space technology.

Space sensors are used in medicine, space-derived material can be found in cars – and these transfers do not have to be big scale to have a big impact. I always draw parallels between the iMac and a regular PC: a little bit of color can make a totally different product.

TO TRANSFER A TECHNOLOGY FROM ONE SECTOR TO THE NEXT SOUNDS A LOT LIKE RECYCLING ALREADY PRESENT KNOWLEDGE. HOW IS THAT INNOVATIVE?

Who says that recycling is not innovative? We have to ask ourselves: do we want to spend millions in R&D or do we just take the result of R&D that already happened and just utilize the outcome and findings of this research and apply them to innovate?

The problem here is that innovation is not lying on the street. You have to be a little bit crazy and think outside the box to draw the connection between different things. Usually a rocket scientist and a health engineer do not meet each other every day – except for maybe by accident on a plane. What ESA's Technology Transfer Programme is doing is bringing these different people together to foster the transfer of knowledge in order to improve technology and in the end create new and innovative products.

3RD ESA INVESTMENT FORUM - REGISTER NOW!

Register NOW!

The year 2009 will see the 3rd ESA Investment Forum, dedicated to bringing start-up companies using space technology, applications or services in a non-space environment together with finance and investment communities.

Organised by Europe Unlimited on behalf of ESA's Technology Transfer Programme Office (TTPO), the ESA Investment Forum will highlight the commercial benefits of satellite and space technology in applications on Earth by giving innovative new ventures that derived their ideas and technology from space tech the opportunity to present their cases in front of a high profile Venture Capitalist community specialized in seed funding. The events is supported by the EC project KIS4SAT, EBN and ENCADRE.

Cases introduced in the previous years covered a broad spectrum of technologies originating from space - sensors, opto-electronics, navigation data, remote operations, satellite communication and imaging technology – and their application in diverse industrial sectors such as automotive, medical, navigation, offshore, security, energy, environment, healthcare, wireless services, multimedia, gaming, sports, communications and transport.

The ESA Investment Forum will take place 6-7 April.

More information on venue and programme will be made available shortly under WWW.ESA.INT/TFP
For further questions, please contact Sue Davies (sue.davies@esa.int).