

newsletter

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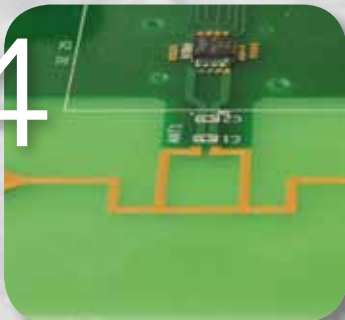
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Intelligent Environments come of age

PHILIPS



Marc Herregods

You walk into your hotel room. Instantly, the lights switch to your preferred settings and the airco to the level you like. Once futuristic, such intelligent environments are now reality – reacting to our needs and supporting people's desire for well-being, sustainability and security. So how do companies play in this field and how do they put all the pieces together?

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Intelligent Environments come of age

PHILIPS

Nowadays IEs (Intelligent Environments) are not only feasible, they are helping address some of the biggest challenges of our times. Take aging populations and soaring healthcare costs. Research shows that tele-monitoring of the elderly at home significantly reduces care costs. Things like fall detection, and contact with medical professionals via easy-to-use interfaces improves quality of life, as well as health. A real win-win.

Everywhere, IEs can bring security, convenience and comfort. The CitizenM hotel concept, for instance, is a step towards homes, workplaces and public spaces that “know” the kind of ambience you like. In this project, Philips Applied Technologies integrated a broad mix of existing technologies so sound, light, warmth and ventilation automatically adjust to guests’ personal preferences.

These intelligent environments may even learn, noticing anomalies or changes. If you take a vacation and forget to switch off appliances, your home will realize you’re not there and do it for you! The possibilities are vast: from wearable electronics that help you keep fit to intelligent “brokers” that not only keep your electric car charged, but also buy energy at the best time / price.

IE requires a mix of competences

So what defines an IE? In a nutshell, it’s an environment that interacts with users based on smart algorithms. It includes real-time decision support so systems can react to people’s needs and help them make decisions based on better information. Think of an emergency crew directed through a burning building or doctors receiving intelligent combinations of medical data. And it can take over tasks you can’t or simply don’t want to do, through hands-free voice control or gesturing, for example.



Intelligent Environments adapt to one’s personal preferences or requirements



Inevitably, they require an array of underlying technologies and competencies, and Philips Applied Technologies covers many: sensor platforms (hardware and software), signal processing (vision, audio, body vital signs, positioning, motion, pattern recognition), smart algorithms that run on low-cost embedded systems, artificial intelligence (for learning systems), connectivity & security (especially wireless).

There are also significant technical and business challenges, particularly because so much has to be integrated. An end-to-end IE architecture might incorporate everything from sensors and actuators, to mobile and broadband gateways and remote servers.

Plus, software is crucial in gluing everything together, and for companies traditionally focused on hardware that can be a steep learning curve. Then there are issues such as regulatory requirements especially in healthcare and automotive, as well as the need for robust systems/software, low power electronics and battery management.

Expert practical support

Philips Applied Technologies helps com-



In an intelligent hospital environment, technology supports the medic and improves patient care.

panies of all sizes tackle these challenges in many ways. It can help bring individual products to market, solve technical issues in processes, or integrate an array of technologies such as for CitizenM.

It also has multi-disciplinary teams who study human interaction with devices and environments, and business know-how to assess commercial viability. Customers can be supported at every stage: concept, design, engineering, industrialization and production ramp-up. And the approach is practical with a clear aim: to seize the potential of IEs by bringing solutions to market quickly and cost-effectively.

Interested in the technologies that can make an Intelligent Environment? See contact details on page 16. ■

About Philips Applied Technologies

As part of Royal Philips Electronics, Philips Applied Technologies is a contract R&D organization that supports the development of products, applications and technical solutions. Its customers are market leaders, fast growing companies and start-ups. For every phase of the innovation process, it offers integral solutions, the right mix of consultancy and specialist services. With over 1000 in-house experts, it can draw on a wide range of competences to innovate fast, efficient and with fresh ideas.



Reconfigurable Zero-IF Transceiver IP for SDR

Introduction to Software Defined Radio (SDR)

Software Defined Radio was coined in 1996 by Joe Mitola, who was working for Darpa, and has been driven by the military industry. Over the last five years, Software Defined Radio has moved from R&D into commercial implementations. Recently many companies have announced new SDR platforms for handsets, for base stations, or for TV and radio receivers. What does make these systems different from dedicated hardware solutions ten years ago?

Technologists think of a SDR as a system where the entire signal chain is done in software with a very limited analog frontend. The holy grail of a SDR system is to capture a wireless signal at the antenna, to filter it and to convert it to the digital domain as shown in Fig.1.

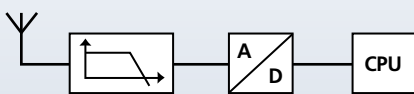


Fig. 1: The ultimate Software Defined Radio

Engineers have realized the following practical implementation shown in Fig. 2:

- an external bandpass filter: this is currently bandwidth limited and is considered as the gating factor for a full SDR implementation
- a fully integrated RFIC with a wide frequency range and a programmable bandwidth
- converters with a scalable resolution and sampling rate
- a fully reconfigurable or reprogrammable baseband processor.

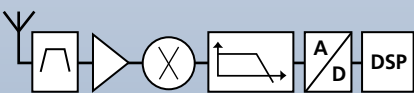


Fig. 2: Practical implementation of Software Defined Radio

But will SDR ever turn into a separate semiconductor product category? One single radio which is a general purpose radio and in which the hardware is not designed for a specific standard or application but that will be defined predominantly by software algorithms? Only the future will tell.

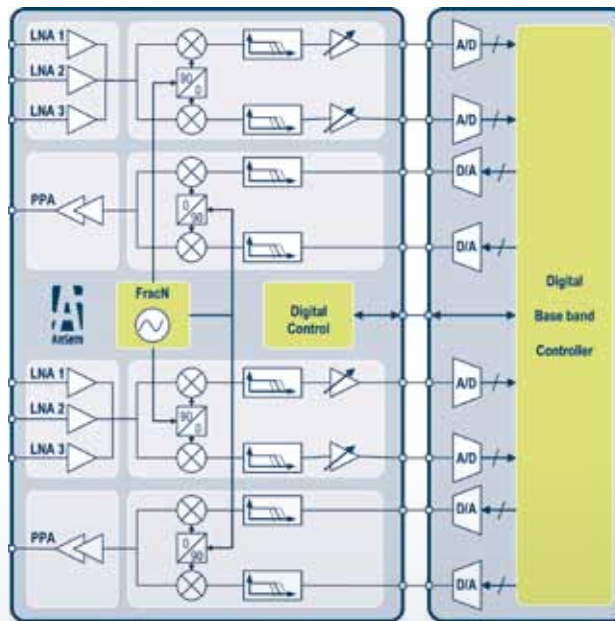


Fig. 3: Block schematic of the ANS2090 macro-IP © Copyright AnSem NV

The ANS2090 Macro-IP

AnSem developed a macro-RF transceiver IP which has a wide frequency range and a programmable radio bandwidth.

A block schematic of this IP is shown in Fig. 3. This circuit, realized in CMOS incorporates a complete Zero-IF receiver, Zero-IF transmitter and Fractional-N frequency Synthesizer. The main advantage of this macro-IP is its reconfigurability. Indeed, via a standard SPI interface, a register bank of 256 bits can be programmed. These digital bits determine the detailed electrical characteristics of all the building blocks inside the macro-IP. The ANS2090 IP is very flexible: the local oscillator frequency can be varied between 0.6 GHz and 4 GHz, in steps of 15 Hz thanks to a fractional-N synthesizer and smart VCO design. The lowpass filters in the receiver and transmitter chains can be programmed in steps of 3% for channel bandwidths between 200 KHz and 20 MHz. All RF building blocks are implemented as wideband circuits, covering the whole frequency range.

Although the ANS2090 allows building a "universal" radio frontend, the external components around the macro-IP are still dedicated to a given frequency band. Therefore, the ANS2090 can be adjusted to incorporate multiple wideband LNAs

– all identical – and multiple identical wideband PA drivers. In this way, multiple sets of external components, dedicated to different frequency bands, can be hooked up. The external Band Pass Filter is the only limiting component of building a complete SDR chain from antenna to the application software.

AnSem can design this IP in an ASIC for its customers in a variety of wireless applications: LTE, WiMAX, GPS, car-entertainment systems

What's next: Cognitive Radio?

Spectrum utilization depends strongly on time and place. Studies show that at any time and any place, only 20% of the spectrum is occupied. A cognitive radio can search for unutilized spectrum and can combine this awareness with knowledge of its user's priorities, needs, and governing regulatory rules

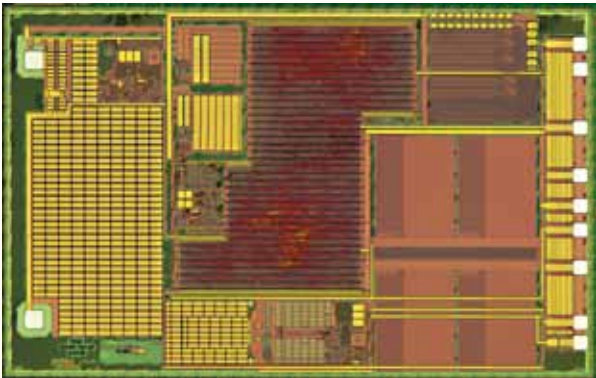
The FCC ruled on November 4th, 2008 that locally unused frequencies or "white spaces" in the broadcast TV spectrum may be used by unlicensed low power users. This ruling will drive the further development of Cognitive Radios which will have SDR as the core technology. Thanks to its experience in SDR and in state-of-the-art RF design skills, AnSem is ready to go for this new challenge. ■

Vacancies

AnSem is looking for: Marketing & Sales Manager

More info on our website:
<http://www.ansem.com/MSM.html>
 E-mail: jobs@ansem.com

Easics and ICsense jointly support development of world's first high memory, passive UHF RFID chip by Tego, Inc.



Micro-photograph of the semiconductor chip

Easics and ICsense, both DSP Valley members, have teamed up in a unique mixed-signal IC partnership led by Tego, Inc to develop the world's first high-memory EPC UHF Gen-2 RFID chip. RFID has a huge potential which is reflected in the multitude of players developing RFID tags and inlays for numerous applications and standards, ranging from simple anti-theft labels and electronic barcode replacements to intelligent wireless sensor/actuator-nodes. The EPCglobal Gen-2 standard is set up to provide a unique 96-bit electronic product code (comparable to a "license plate"), embedded in a passive (battery-less) RFID tag. Compliant tags operate in the UHF-band (860 ... 960 MHz), and communicate over the air at speeds up to 640 kilobits per second. They support a collision-resolution method that allows an RFID-reader device to simultaneously query multiple tags. Tags harvest all their required energy from the received RF-waves transmitted by the reader. They fully operate and communicate without batteries or any other similar energy source. Being a versatile and intelligent barcode replacement, EPCglobal Gen-2 is rapidly becoming the industry standard for both item-level and container-level tagging in supply chains worldwide. It is also ratified as ISO standard 18000-6C.

Led by Tego, Easics and ICsense took the standard one step further, by adding extended on-chip non-volatile memory up to 32 Kilobytes and additional functionality, including an external I2C inter-

face towards its environment. The cooperation started when Tego contracted Easics to support the development of its Gen-2 UHF tag product family. First, an FPGA-prototype was developed as a demonstrator and prototype, then the ASIC. Easics was selected based on its impeccable track

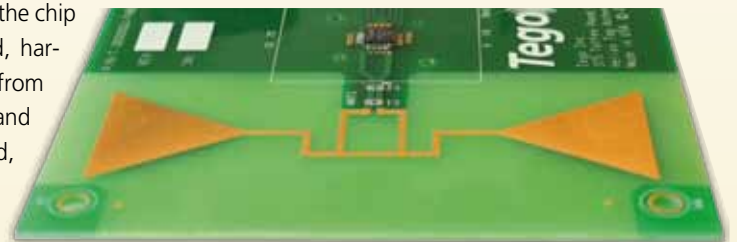
record in digital chip design to support various communication protocols. For the RF front-end and analog portion of the chip, Tego contracted ICsense to team up with Easics. The vision behind this novel RFID development is "active functionality in a passive tag". To enable this vision all companies cooperated closely to come up with an innovative and scalable chip architecture. This enables the chip to, on the one hand, harvest as much power from the air as possible, and on the other hand, put every functional block inside the chip on a strict and actively regulated power diet. "The TegoTagtm is truly revolutionary for the tagging industry," said Dr. Marlin Mickle, professor of Industrial Engineering and executive director of the RFID Center of Excellence at the University of Pittsburgh. "The chip's breakthrough power harvesting and memory technology enable new capabilities until now limited only to battery powered tags."

The ultra-low power optimization concept has been rigidly applied to all parts of the chip and required close interaction between the teams.

In spite of its complexity, the resulting silicon was first-time-right and could be wirelessly tested straight from the factory. The excellent results show the success of the mixed-signal cooperation between ICsense and Easics. Both companies have



substantially reduced the design risks by pursuing optimal system-level trade-offs and partitioning over the boundaries of digital and analog. The digital, analog and RF parts of the chip are co-verified, not only from a functional point of view, but also towards maximal power extraction from the air and minimal internal power consumption.



Prototype of the chip in a plastic package, connected to an etched antenna. For mass-production, the package will be removed

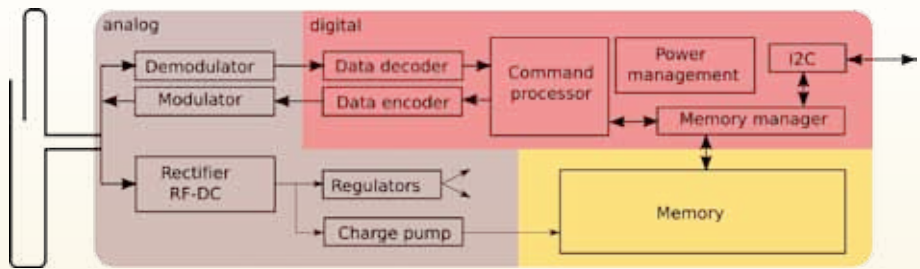
This chip is enabling a new generation of functionality and capabilities, says Tego's CEO, Timothy Butler: "We haven't just introduced a tag with a small increase in memory capacity. We've gone from the equivalent of a license plate to a whole novel. In fact, TegoTags can store more than two thousand five hundred times the amount of data that is standard in the industry today, and last 20 plus years versus only a few years for all tags currently available." The tags already allow the aviation industry to share maintenance information across multiple organizations with separate databases. For example, Airbus has analyzed how high memory technology can be used in aviation, and identified huge cost savings and other benefits. Airline maintenance and repair requires cataloging and tracking thousands of

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parts. A TegoTag attached to a specific part can hold its entire maintenance history, providing valuable information to personnel responsible for the safety and upkeep of the aircraft. According to Airbus, high memory tags allow technicians to make repairs efficiently in the field or at remote airstrips. Airbus has published requirements for its suppliers to tag parts on their planes by end of 2009. Today, the TegoTag is the only commercially available tag that can meet all the

About Easics NV

Easics is an independent System-on-Chip design company, founded in 1991, and located at the Arenberg Science Park in Leuven, Belgium. Easics specializes in chip design using both digital & mixed-signal ASIC- and FPGA-technology. Easics' expertise and IP includes connectivity, hardware/software co-design, digital signal processing and low power design. Easics' customer base consists of leading companies, active in industrial, measurement, consumer, wired & wireless telecom and medical markets. (www.easics.com)



Block-diagram of the chip

stated requirements. Tego provides tags, software and chips for third parties to develop unique tag applications. Aviation,

defense, security, oil and gas, transportation and medical are already key markets.

About ICsense NV

ICsense is a foundry independent IC design house, based in Leuven, Belgium, offering state-of-the-art IC design services and supplying turnkey solutions for custom wireless transducer systems. The core business of ICsense is analog, mixed-signal and high-voltage integrated circuit design. ICsense has a key competence in the design and supply of sensor, actuator and MEMS interface, data-acquisition, power management and high-voltage ASICs. ICsense is the preferred partner of several international companies. ICsense is ISO 9001:2000 certified. (www.icsense.com)

About Tego, Inc.

Founded in April 2005, Tego is developing breakthrough technology that enables a whole new generation of applications beyond traditional RFID (Radio Frequency Identification). Its tags, software and system design provide new solutions to address vertical applications and markets including asset tracking and management; performance management, safety, security & authentication, regulatory compliance, and supply chain management. Tego is based in Waltham, MA, USA. (www.tegoinc.com)

The importance of DSP according to Forward Concepts.

More than 10 years ago, DSP Valley has made a strategic choice: we have chosen digital signal processing as our key technology focus for our networking organization, and we have chosen the name DSP Valley accordingly. During all these years, there have been many disputes whether this name was still reflecting what we were focusing at, and whether we should change the name. And yes, it is true: today our focus has slightly been enlarged, to include also embedded software design (for signal processing applications), and to include analog front-ends and mixed signal processing chips.

But the real core of our focus remains DSP – digital signal processing. And what we have already recognized so many years ago is now confirmed by Will Strauss, president and principal analyst at Forward Concepts: although the Digital Signal Processor sector is continuing to lose its identity as a separate chip class, DSPs have actually become the driver for the entire semiconductor industry, even in the current economic downturn period.

It is important however to make the right interpretation: today, the key DSP technology that has enabled many important revolutions, from the CD and DVD players,

to digital cell phones and digital photo cameras and MP3-players, is not just anymore the Digital Signal Processors, as we know them from the market leaders like Texas Instruments and Analog Devices. DSP is also the large amounts of ASIC including a signal processing functionalities, such as the 3G baseband chips by Qualcomm. DSP is also the large amount of general purpose MCUs and MPUs that have added Multiply-Accumulator (MAC) circuitry or Single-Instruction Multiple-Data (SIMD) circuitry to their architecture.

The strategic choice of DSP Valley of more than 10 years ago still proves

Sundance builds out PXI Express Product Line with SMT712

Sundance SMT712 Module Optimized for High Bandwidth Applications Enabled by PXI Express. Expands the Sundance 7-Series Family of PXI Express DSP/ FPGA Multiprocessor Solutions.

SUNDANCE

Sundance, the leading supplier and manufacturer of advanced digital signal processing (DSP) and reconfigurable FPGA solutions announced the expansion of its multiprocessor PXI Express offering with the immediate availability of its SMT712 Dual DAC PXI Express Hybrid Peripheral Module. The SMT712 module is a dividend of the Sundance PXI product development roadmap that was announced in October 2008. It demonstrates the Company's ongoing commitment and investment in the PXI open specification and brings extreme FPGA acceleration to PXI Express systems.

The SMT712 integrates two fast 12-bit DACs, 2 banks of 64 bit wide 300MHz DDR2 memory and 8 lanes of 2.5Gbits/s PXI Express. At the heart of the SMT712 is a Xilinx Virtex 5 LX110T device, optimized for high performance logic and advanced serial connectivity. The device features 640 User I/O, 64 DSP48E slices and can access both 1GB DDR2 memory banks to store data on the fly.

Optimized for wideband communications and radar applications the module's Dual DACs feature an update rate up to 2.3Gbps and have four 12-bit multiplexed low-voltage differential signaling (LVDS) input ports that operate up to 575MHz. They have outstanding spurious and noise performance and can be used for synthesis of wideband signals in the frequency range from DC to more than 2GHz. Their 2.3Gbps update rate allows digital generation of signals with more than 1GHz bandwidth.

"With the SMT712 we can offer our PXI Express customers a multiprocessor module that is optimized for wideband

communication, radar, wireless modem and software radio, in other words the types of high bandwidth applications that are best enabled by PXI Express," said Flemming Christensen, managing director of Sundance Multiprocessor

Optionally, the SMT712 can be a 3U Hybrid Peripheral Slot Compatible PXI-1 Module that is supplied with the XP4 connector (PXI timing and synchronization signals) and the P1 connector (32-bit, 33MHz PCI Signals).



Technology^{ltd}. *"Our choice and specification of components means the SMT712 delivers best-in-class performance and provides maximum flexibility for the systems interconnect."*

As standard, the SMT712 is a 3U PXI Express peripheral module supplied with two PXI Express connectors: XP4 (PXI timing and synchronization signals); and, XP3 (x8 PCI Express and additional synchronization signals). The SMT712 dedicates 8 lanes to the PXI Express bus to give an effective bandwidth per direction of 16Gb/s. The standard SMT712 can plug in any PXI Express Peripheral Slot or any PXI Express Hybrid Slot.

PXI is an open specification governed by the PXI Systems Alliance (www.pxisa.org) that defines a rugged, CompactPCI-based platform optimized for test, measurement and control. Increased support for the specification strengthens the penetration of Sundance products into markets where PXI standards conformance and rugged design are a must.



IMEC launches research program to improve dynamic behavior of embedded systems

To deal with the increasing dynamism in (networked) embedded systems, IMEC launches a new research program. This program will focus on moving the management of the system's resources from the design phase to runtime software solutions. The resulting embedded systems will be more flexible and efficient, and will have a shorter time-to-market. Systems that would profit from such improved dynamism are, for example, multimedia appliances, from servers to mobile devices, standalone or connected in a video processing network. Other examples are cognitive radios, sensor networks, body area networks, or smart energy grid applications.

Today's embedded systems operate under increasingly dynamic conditions. They have to support unpredictable interaction with users or with the environment. And they should work with widely varying input data, downloadable software, online services, and a wider range of software applications than is traditionally supported by embedded systems. Worst-case system designs take into account all this unpredictability upfront, resulting in over allocated resources, higher costs and longer time-to-market. In addition, embedded systems that are connected in a network also have to deal with the dynamism and unpredictability of distributed systems, further increasing the design chal-

lenges. This forces designers of embedded systems to consider alternatives to the traditional design methods.

IMEC's new research program will examine methods to optimally exploit the flexibility offered by modern hardware platforms and networks. These have the hardware that is needed to implement a more dynamic behavior: multiple heterogeneous processing cores, including general-purpose processors. And in a distributed setting, the number and variety of available processing elements is even larger. This allows more flexibility to select processing resources for executing software, not only at design time, but also at run time. The goal of IMEC's program is to create a run-time

resource manager that addresses the dynamically changing conditions and makes a trade-off between processing availability and type, communication bandwidth, power consumption, or any other relevant constraint, while meeting the required quality of service. In addition, the program will contribute to the software infrastructure that exchanges information with the run-time manager. Different versions of this infrastructure will range from light-weight to advanced, depending on the openness of the software development methods used in a particular project. Advanced infrastructure will offer techniques such as virtualization, managed code, just-in-time compilation and optimization. ■

About IMEC

IMEC is a world-leading independent research center in nanoelectronics and nanotechnology. Its research focuses on the next generations of chips and systems, and on the enabling technologies for ambient intelligence. IMEC's research bridges the gap between fundamental research at universities and technology development in industry. Its unique balance of processing and system know-how, intellectual property portfolio, state-of-the-art infrastructure and its strong network of companies, universities and research institutes worldwide position IMEC as a key partner for shaping technologies for future systems.

IMEC vzw is headquartered in Leuven, Belgium, has a sister company in the Netherlands, IMEC-NL, concentrating on wireless autonomous transducer solutions, and has representatives in the US, China, Japan and Taiwan. Its staff of more than 1650 people includes more than 500 industrial residents and guest researchers. In 2008, its revenue (P&L) is estimated at about 264 million euro.

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to be valid. As a key enabling technology in this era of always-connected access to the Internet and multimedia, DSP in particular and embedded signal processing technology more in general, will

also remain our focus point for the next decade. ■

Dr. Peter Simkens
Managing Director
DSP Valley



IMEC unveils tools to speed up design of energy-efficient multi-processor SoC platforms



IMEC, Europe's leading independent nanoelectronics research institute, unveils a suite of tools and methods to optimize the mapping of applications on embedded multiprocessor system-on-chip (MPSoC) platforms. These result in systems that are more energy-efficient and that can be designed faster, leading to a shorter time-to-market. IMEC's MPSoC tools are intended for companies that design multicore platforms for tomorrow's nomadic and multimedia applications. They are offered under a technology transfer or license agreement.

e.g. IMEC's advanced multi-core platform for software-defined radio and a multi-core multi-media platform using 6 of IMEC's ADRES processor cores. Interested companies may license the tools, or acquire them under a technology transfer agreement. ■

The first industrial multiprocessor system-on-chip (MPSoC) platforms have already found their way into embedded systems for advanced entertainment and communication platforms. In addition, the ever increasing performance hunger of battery-operated embedded devices, such as cell phones or portable media players, also calls for multi-core architectures. But mapping applications efficiently on MPSoC remains challenging. Due to the vastness and complexity of the design space, i.e. the number of design options, this task is virtually impossible without the proper tool support.

ogy's two main threads offer support for fast parallelization (with the Multi-processor Parallelization Assistant tool) and support for memory hierarchy optimizations (with the Memory Hierarchy tool).

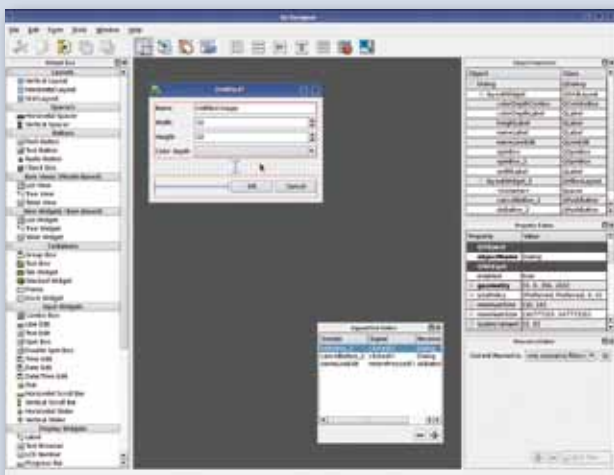
IMEC's tools, methods, and associated services have a proven industrial strength. They have been used by IMEC's industrial partners for commercial embedded systems as well as for in-house IMEC MPSoC implementations,



Imec's BEAR chip, a heterogeneous multi-processor MPSoC containing a programmable baseband platform for the next generation of mobile devices.

The IMEC MPSoC technology provides solutions by focusing on design-time application mapping. The technol-

Mind provides services on Qt to enable improved user interface and application development



Screenshot Qt Designer: Linux

Qt is a cross-platform application and User Interface framework which provides all the functionality needed to develop advanced GUI applications on desktop and embedded platforms. Qt uses the native graphics APIs of each platform it supports, taking full advantage of system resources and ensuring that applications have native look and feel. One of the main features of Qt is that it allows to write applications once and to deploy them



across many desktop and embedded operating systems without rewriting the source code. For instance, code for the desktop can be reused on an embedded platform by just recompiling. Qt can be used on Windows, Mac OSX, Linux/X11, Windows CE, embedded Linux and the S60 Symbian platform (later this year). It is perfect for use on embedded Linux

Wireless Community: stay tuned on the technological evolutions in wireless communication

More than 200 experts from Belgium & the Netherlands came together at IMEC for the launch of the "Wireless Community" on February 19. With this initiative, IMEC - in collaboration with IBBT - promotes the dissemination of technological expertise in the domain of wireless communication.



If you would like to hear the evolutions in wireless communication from first-hand, if wireless technology is the key to your innovation process, then the community is there for you!

Sharing interpreted information on wireless technologies and standards

The Wireless Community brings together a group of scientific experts from local industry, academic research groups and innovation actors. The primary objective is to follow up on the recent evolutions in wireless communication, and to share information during regular work meetings and via an *online platform*.

No single individual or organization is capable of following up on the extremely fast evolutions that we observe in wireless communication today. The added value of the community lies in the *inter-*



pretation and structuring by experts of the bunch of information that is available on wireless communication.

We only deal with publicly available information in the community. IP is not used nor created in the community.

Topics are chosen by the members

The members themselves decide upon the topics that are discussed in the community. Typically, the presentations and discussions in the work meetings include:

- follow up of (IEEE) standardization
- on-going R&D at one of the member labs
- long-term evolutions in wireless
- market trends

- applications of wireless technology

Coordinated by IMEC, in collaboration with IBBT

IMEC is the coordinator of the community, and the work meetings will be hosted in turn by IMEC (Leuven, Belgium) and IBBT (Ghent, Belgium).

Information sharing amongst the members is facilitated by the use of an online document sharing platform that is hosted by IMEC.

Reasons to join: information - networking - visibility

As a member of the community, you will have several important benefits:

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thanks to the highly efficient core libraries, its high flexibility allowing selectively included features and the compact windowing system on top of a (hardware accelerated) frame buffer. Qt's extensive class library can be used by native c++ applications or other, using the language bindings: PyQt, QtRuby, Qt Jambi (java).

Qt Software, the Nokia unit formally known as Trolltech, has just released a new version 4.5 of Qt which is now also available under the GNU Lesser General Public License (LGPL). The introduction of the LGPL will allow closed source applications to be linked to the Qt libraries without having to conform to the same license requirements. Up until this move,

building proprietary applications with Qt was only possible by acquiring a commercial license. Of course, for companies who can not adhere to the conditions of the LGPL, Qt 4.5 will still be available under the commercial licensing terms available via Qt Software. The press release states that *"The move to LGPL licensing will provide open source and commercial developers with more permissive licensing than GPL and so increase flexibility for developers."* By removing all possible barriers to adoption Qt Software intends to reach its goal captured in the slogan "Qt Everywhere". Several companies have already confirmed to be deploying Qt in the near future and news sources speculate on a 20-fold increase in Qt

adoption within the year, increasing the demand for skilled developers and specific training.

To address this market demand, and to participate to a larger adoption of Qt, Mind provides specific consultancy, development and training for Qt and embedded Qt. Mind has accumulated 10 years of experience in providing consultancy and services on Open Source Software for Embedded Systems and has also a strong specific expertise in Qt gained on several recent projects. All this will allow companies to be up and running more rapidly on Qt and to implement more efficient, yet more portable, user interfaces in their products. ■

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- stay informed about the latest developments & long-term evolutions in wireless
- networking opportunity with academic institutions and local industry
- visibility for your organization
- you are involved, and you can put your topics on the agenda
- easy access to expert information (short driving distances; pay for services only)

Inspired by the MultiMedia (MuMe) Community

The motivation to start-up a Wireless Community is inspired by the success of the MultiMedia Community (MuMe) that focuses on multimedia technologies and standards.

Since its start in late 2004, the MuMe Community has organized 12 work meetings and 2 open seminars, all hosted at the IMEC premises in Leuven, Belgium. The MuMe Community currently has 29 member organizations. See www.mume-

community.com for more information.

How to join the Wireless Community?

As a compensation for the services offered by the community, companies pay an annual membership fee that depends on the size of their organization (from 250 to 1650 EUR/yr, excl TAX).

Members of a supporting network organization get a reduction of 20% on the applicable fee. DSP Valley is a member of the community, so **DSP Valley members receive a 20% discount.**

Members of the MuMe Community get an (additional) 40% reduction on the applicable fee.

Research organizations and innovation actors do not pay a financial contribution. Membership is open to every organization that is active in the value chain of wireless communication, and that has the ambition to share its expertise with the members of the community.

Every member is expected to actively participate in the work meetings, and to

share expert information via the online platform.

Strong member base from the start

At the launch event of the community, 12 organizations have announced their commitment to support the community. This number has grown to almost 20 at the time of writing.

Companies, universities, poly-technical high schools as well as innovation actors are all well represented in the community.

You will find an up to date list of members on the website of the community.

Check the website for more information. For more information and membership of the Community, contact Kris Hermus (Kris.Hermus@imec.be), or check the website of the community at www.wireless-community.be.

On Wednesday **May 27** from 2-6pm the members of the Wireless Community will come together at IMEC for their **first work meeting**. ■

ICsense appoints new Director of Marketing and Sales



ICsense, a mixed-signal and high-voltage semiconductor design house specialized in IC design services and in the design of integrated ultra low power sensor systems has appointed Raoul Daniels as Director Marketing and Sales. Raoul has a wealth of knowledge, accumulated over 25 years, on Semiconductor Marketing within the Medical, Industrial, Automotive and Consumer Industry. Previously working for MIPS/Chipidea where his last position was to be the Site Manager and Marketing Director for the Analog ASIC product line, he also held Strategic Marketing responsibility for the Low-Power and Wireless Semiconductor Products at AMIS, ON Semi and Texas Instruments.

"With his appointment, ICsense wants to further strengthen its market position as the number one IC design house for power management, sensor interfaces and high-voltage ASICs", states CEO Bram De Muer. "While ICsense is now an established player in the Belgian and neighboring market, Raoul will take ICsense to the next level of internationalizing its expertise and services. His vast



network will help us to achieve these goals in the foreseeable future." Raoul has started at ICsense on the 2nd of February. ■

About ICsense

ICsense is a foundry independent IC design house, based in Leuven, offering state-of-the-art IC design services and supplying turnkey solutions for custom wireless transducer systems incorporating its own ASICs. The core business of ICsense is analog, mixed-signal and high-voltage integrated circuit design for automotive, industrial and medical markets. ICsense has a key competence in the design and supply of sensor, actuator and MEMS interface, data-acquisition and high-voltage ASICs. ICsense is the preferred partner of several international companies for IC design services and ASIC and sensor system development and supply. ICsense is ISO 9001:2000 certified.

AUTOSAR – Standardised software in vehicles



Description

Embedded software in vehicles gains significance by the day. Up to 90% of all car innovations are electronics related. As a consequence, development of new software or improvement of existing software is involved.

The AUTOSAR consortium (**AUT**omotive **O**pen **S**ystem **AR**chitecture) has developed a number of standards which enables to homogenize the significant amount of software in vehicles by means of a universal platform. This allows opening up the automotive market to new players in the automotive and software industry. Moreover, AUTOSAR provides a software development methodology for automotive applications. This shortens the software development process and reduces the engineering cost.

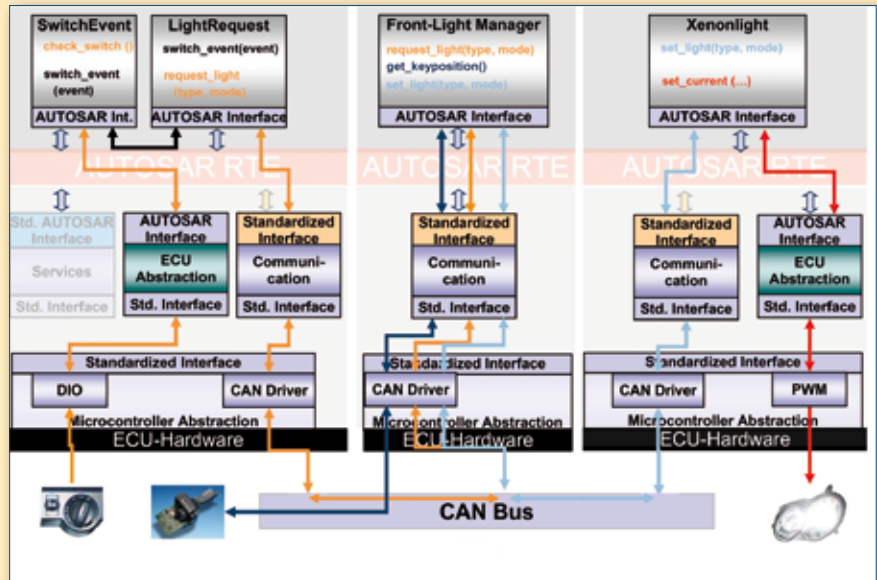
AUTOSAR's impact is expected to be major: almost every large car manufacturer is a core member of the AUTOSAR consortium.

As a knowledge centre with a strong competence in the field of Automotive-ICT, Karel de Grote-Hogeschool is determined to follow this promising evolution up close in cooperation with a versatile group of Flemish suppliers, manufacturers and other partners active in automotive electronics, embedded software and mechatronics.

Research

This project starts with the study of the AUTOSAR standards. Related to this work, we'll also look at the commercially available SW-tooling supporting the AUTOSAR-standards.

Once we've acquired the theoretical background and the necessary tools, we can start building a single ECU demonstration platform. Such a platform will allow us to translate our theoretical AUTOSAR knowledge into practice by implementing typical, small AUTOSAR applications. This demonstration platform will then be extended to multiple



ECUs connected through an automotive network such as CAN, FlexRay or LIN.

In the next phase of the project, we'll implement different case studies provided by the user committee. The goal at this point is twofold: on the one hand it enables us to transfer our AUTOSAR expertise to our partners; on the other hand it allows applying our academic knowledge to the economic reality.

Additional project deliverables are related to training, compiling course material and spreading AUTOSAR understanding by means of workshops and a project website.

Industrial partners / User committee

DSP Valley, Flanders' DRIVE, Flanders' Mechatronics Technology Centre, Dana Spicer Off-Highway, EIA Electronics, LMS International, Luperco, Melexis, NXP Semiconductors, Open License Society, Punch Powertrain, Triphase, Verhaert New Products and Services.

Project title	AUTOSAR – Standardized software in vehicles
Goal	Researching the AUTOSAR-standards and transferring this know-how to the automotive and software industry.
Academic Partners	Karel de Grote-Hogeschool, Department of Industrial Sciences and Technology
Contact person	Paul De Meulenaere, paul.demeulenaere@kdg.be Marc Van Vlimmeren, marc.vanvlimmeren@kdg.be Joachim Denil, joachim.denil@kdg.be Kris Bellemans, kris.bellemans@kdg.be
Website	www.kdg.be
Due date	31/11/2010
	This TETRA project is supported by IWT

DSP Valley @ Embedded World 2009

3 – 5 March 2009, Nürnberg, Germany



For the seventh time DSP Valley was present at the Embedded World Exhibition&Conference. This event is clearly one of the biggest get-togethers for the embedded industry in Europe. According to the exhibition organizer more than 700 exhibitors showed their products and services. Despite the world wide crisis this is

clearly an increase compared to last year and the number of international companies, especially from East Asia, accounts for almost one quarter of that. The number of visitors was almost 15.900 for the exhibition and the conference was attended by over 1000 embedded specialists and



In times when wireless communications are omnipresent, there is a constant development of related technologies. In particular, the importance of wireless sensor networks (WSN's) will increase significantly. WSN's will get a place in different sectors (e.g., home automation, agriculture, controlling industrial processes, logistics,).

The WSN technology, described by the IEEE's 802.15.4 standard, is subject of investigation for several collaborators of the DraMCo research group of the KAHO-Sint Lieven Technology campus in Ghent (Belgium).

The 802.15.4 standard is known to have low capacity consumption and is often



Course on Zigbee

Ghent, Belgium – February 12, 2009

used in the WSN's. These kinds of networks provide a straightforward solution for issues such as indoor location determination. At present the knowledge of this new technology is limited to "what" and "why" in many companies. Often the technical background is unknown. We have tried to fill the gap with a textbook and a related one-day course.

In order to give the industrial partners the opportunity to get to know the theoretical side of the Zigbee-standard, the DraMCo group invited them to an information session on February 12, 2009. Students "Master in industrial sciences Electronics-ICT" were able to participate and thus having the opportunity to acquire extra knowledge. The attendance number of more than seventy did exceed our expectations and this confirmed that there was an industry based demand for a more in-depth study of this standard.

The course was subdivided into several



topics. First of all, a general survey of this type of networks was presented. Afterwards there was an in-depth study of the Zigbee communication standard. This standard was particularly developed to build low power, low cost and solid WSN's. By means of the different network layers, an overview of the Zigbee standard was presented. The general characteristics of Zigbee were placed in the broad framework of WSN's. Other important issues, such as privacy and security, were treated as well. At the end of the day, an overview of the different producers of Zigbee devices products was given.

The goal of this study day was to go beyond the introducing level of the standard and to provide insight in the different mechanisms that make Zigbee a unique standard. The objective of the course was to initiate developers to use the power of Zigbee in their products and to keep specialists informed on the latest developments in wireless communications.

The presentations were given by the DraMCo-staff. These people also composed an extensive syllabus of more than 100 pages, being a surplus value for this day. Participants were very positive afterward. To be continued!

speakers from 35 countries.

As a good tradition there was the presentation of the Embedded AWARD on the opening evening. The award is adjudged to companies that have made a remarkable contribution to embedded technology. The prize winners in the three categories were: Texas Instruments (Hardware category), Coverity Inc. (Software category) and DSP Valley associated member Express Logic (Tools category).

DSP Valley, distinguishing itself as a

center of excellence in DSP and embedded systems design, was present with several of its members: AnSem, Association Ghent university, Barco Silex, Dekimo, Easics, Essensium/Mind, /k/ Embedded Java Solutions. The group booth was located in hall 12 which was not completely covered with booths as it was last year. The impression was that the number of visitors was lower compared to last year but the visitors were more focused.

Participation at the group booth of DSP Valley is a good chance for the smaller

companies in the network to be present in a cost efficient way. The co-exhibitors keep their own identity in the exhibitor list on the Embedded World website, in the exhibitor catalogue and on the booth but the booth was set up in such a way that a common look and feel was shown. For DSP Valley it is a unique opportunity to present itself and its activities to the embedded community.

The embedded world 2010 Exhibition&Conference takes place in the Exhibition Centre Nuremberg from 2-4 March 2010. ■

Positioning and Context-awareness International Conference 2009 - PoCA2009

<http://www.artesis.be/iw/elab/poca>

Metropolis Business Center,
Antwerp, Belgium
May 28, 2009



SCOPE

The e-lab research group mainly aims at establishing itself as a center of knowledge in the fields of positioning on the macro, medium and micro level, auto-identification, and the different RF communication Technologies in general.

One of the focuses of this research group for the upcoming years will be 3D location tracking, more specifically the development of a platform for an interworking of embedded localization and communication system. The aim of this project is to seamlessly combine the possibilities for outdoor and indoor localization for the end user through the use of different technologies, such as GPS/Galileo, GSM, WiFi, WSN and RFID, augmented with extra input from different kinds of sensors (e.g. MEMS).

With the PoCa2009 conference, the e-lab research group seeks to gather European researchers and their expertise concerning systems, services and all kinds of applications to detect, interpret and use location information in combination with context information. Context information is related to the

PROGRAM

08:00 – 09:00: Registration

09:00 – 12:00: Welcome, Luc Pieters (Artesis University College of Antwerp)

- Karel Renckens (IOK Solutions) *"Tapango: a great shortcut to launch NFC now"*
- Jared Willems (Denayer) *"How to detect human fall in video - An overview"*
- Glen Debarde (K.H.Kempen University College Mobilab, Biosciences and Technology Department) *"FallCam: Practical Considerations in Implementing a Camera-based Fall Detection System"*

Coffee Break and possibility to visit WCTI 2009 expo

- Georges Gielen (Catholic University of Leuven, ESAT) *"PINBALLS: PIN-less Battery-Less Low-power microSystems"*
- Geoffrey Ottoy (KaHo Sint-Lieven) *"Improving the Performance of a RSS-based Location Estimation System, Study and Evaluation"*
- Mohamed Laaraiedh (University of Rennes 1, IETR Labs) *"Enhancing positioning accuracy through RSS based ranging and weighted least square approximation"*

12:00 – 14:00: Lunch break + visit fair Wcti2009

14:00 – 17:00: Martin Klepal (Cork Institute of Technology) "Indoor localization - What are the killer applications?"

- Sigit B. Wibowo (Cork Institute of Technology) *"Time of Flight Ranging using Off-the-shelf WiFi Tag"*
- Warsun Najib (Cork Institute of Technology) *"A Software Development Model for Localization System"*
- Peter Ibach (Humboldt Universität zu Berlin) *"Handset-based GSM Positioning with MagicMap"*

Coffee Break and possibility to visit WCTI 2009 expo

- Silverio C. Spinella (University Mediterranea of Reggio Calabria) *"Indoor positioning techniques based on WLAN/RFID technology integration"*
- Nicolae Cosmin Vărlan (Alexandru Ioan Cuza University of Iasi) *"A Social Approach on Creating Dynamic Maps"*
- Yasuhiro Ohhikata (Tokyo Denki University) *"Compensation of Clock Offset and Jitter for Improving Two-Way Ranging Accuracy"*

17:00 – 18:00: Closing and Networking drink

continuation from page 13

activity and goals of users and the movement of assets in a typical or changing environment.

LOCATION

Metropolis Business & Communication Center
Groenendaallaan 394
B-2030 Antwerpen - Belgium

REGISTRATION

For more information and registration, visit www.artesis.be/iw/elab/poca

WCTI2009

Simultaneously with PoCA 2009 and on the same location, Wcti 2009 will be organized. Two consecutive editions of the RFID event in the past years have proven that also in Belgium the demand for Wireless controlled processes keeps



growing. To better fit the frame in which these processes are situated, the exhibition program has been widened. For this reason the name for the event has likewise been modified.

Primarily, emphasis will be laid on RFID - RTLS - MESH - WLAN.

Additional attention will be paid to WMS, GPS, ERP, EPC, Bluetooth, UMTS, CRM, ZigBee, NFC...

Like the RFID event, Wcti 2009 presents a combination of commercial stand booths and informative business cases. The latter will be accompanied by several plenary lectures.

<http://www.wcti.be>



ESEC 2009

Tokyo, Japan
13 - 15 May 2008

DSP Valley and Flanders Investment & Trade (FIT) will be present with a group booth on the 12th Embedded Systems

ESEC ^{12th} **EMBEDDED SYSTEMS EXPO**

Expo & Conference. The venue is Tokyo Big Sight in Tokyo (Japan).

Apart from DSP Valley and FIT, AnSem, ICsense, NXP Innovation & Technology and Target Compiler Technologies will present their products and services.

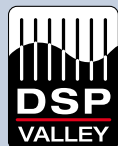
<http://web.reedexpo.co.jp/ESEC/en/>

The exhibition runs in parallel with eight other IT related exhibitions and attracted more than 110.000 visitors last year.

We are looking forward to meet you on our booth 42-2.

Exploring GUI design for embedded systems

Zuiderpoort Office Park,
Ghent, Belgium
June 9, 2009



On June 9th, 2009 DSP Valley and IBBT will organize a seminar about Graphical User Interface (GUI) design for embedded systems.

As the name says embedded systems are systems that are embedded in a larger whole. Sometimes these embedded systems do not have interaction with the user of the system but in areas like consumer electronics more and more smart and appealing GUIs come in our daily life. Apart from the extended functionalities, the embedded application develop-

ers are also haunted by the problem of constantly changing platforms. But porting embedded applications to new platforms is not an easy task so how can GUI applications became less sensitive to these changes?

What design techniques, toolkits... can help the developers to cope with these challenges and how can they help to speed up the development of these GUIs?

During this seminar the experts from industry and the academic area will share with you their experiences and best practices. The seminar is meant for embedded software engineers, system engineers and project managers who are interested in developing rich and appealing GUIs.

<http://www.dspvalley.com>

In parallel to the presentations a mini-exhibition will show products and demos. We will provide time and opportunity to network with the different participants and presenters to allow discussions on details.

The complete program details will soon become available on our website: <http://www.dspvalley.com>

All the presentations will be given in English.

For more information please contact Filiep Vincent (filiep.vincent@dspvalley.com) or +32 16 24 14 43)

Advanced Concepts for Intelligent Vision Systems - Acivs 2009

<http://acivs.org/acivs2009/>

**Organized by the SEE
Mercure Chateau Chartrons,
Bordeaux, France
September 28 - October 2, 2009**



Acivs 2009 is a conference focusing on techniques for building adaptive, intelligent, safe and secure imaging systems.

Acivs 2009 consists of four days of lecture sessions, both regular (25 mins) and invited presentations, poster sessions and a special session on performance assessment of vision systems. The proceedings of Acivs 2009 will be published by Springer Verlag in the Lecture Notes in Computer Science series and are listed in the ISI conference proceedings citation index.

Acivs 2009 will feature a conference dinner, and other social activities.

The conference fee includes the social program (conference dinner, opening reception, and cultural activities), coffee breaks, daily lunches and a hard-copy of the proceedings. Students, IEEE and SEE members can register at a reduced fee.

Invited speakers

Acivs 2009 will feature the following invited speakers:

- Patrick S.P. Wang (Northeastern University, Boston, MA, USA and East China Normal University, Shanghai, China).
- Steve Sangwine (University of Essex, UK). *'Colour image processing by linear vector methods using projective geometric transformations.'*
- Jordi Inglada (CNES, France). *'Multi-modal similarity measures for change detection and image registration. Theory overview and perspectives for high and very high resolution remote sensing data.'*

Topics include (but are not limited to)

- Vision systems, including multi-camera systems
- Image and Video Processing (linear/non-linear filtering and enhancement, res-

toration, segmentation, wavelets and multiresolution, Markovian techniques, color processing, modeling, analysis, interpolation and spatial transforms, motion, fractals and multifractals, structure from motion)

- Pattern Analysis (shape analysis, data and image fusion, pattern matching, neural nets, learning, grammatical techniques) and Content-Based Image Retrieval
- Remote Sensing (techniques for filtering, enhancing, compressing, displaying and analyzing optical, infrared, radar, multi- and hyperspectral airborne and spaceborne images)
- Still Image and Video Coding and Transmission (still image/video coding, model-based coding, synthetic/natural hybrid coding, quality metrics, image watermarking, image and video databases, image search and sorting, video indexing, multimedia applications)
- System Architecture and Performance Evaluation (implementation of algorithms, benchmarking, evaluation criteria, algorithmic evaluation)

Both classical research papers and application papers are welcome.

Techno-Vision special session: performance assessment of vision systems

The objective of this special session is to provide a forum for researchers, industry, and users of vision systems to present and discuss the state-of-the-art in performance assessment of machine vision and image processing systems.

Prospective authors are invited to submit papers addressing issues such as (but not limited to): database construction, task decomposition, metrics selection and/or

design, protocols, workflow automation, scientific, technical and organizational conclusions provided by the experiments conducted in the evaluation campaigns, etc.

The papers should be submitted in the same way as regular papers, but authors should indicate their preference for the special session during the electronic paper submission process.

Venue

The conference will take place in the Mercure Chateau Chartrons, Bordeaux, France on September 28 - October 2, 2009. Bordeaux is 12 km from the Mergnac International Airport (<http://www.bordeaux.aeroport.fr/>).

Bordeaux can also be reached by train from Paris (average travel time: 3 hours).

Paper submission and review process

Prospective authors should prepare a full paper and submit it electronically.

Papers should be submitted in LaTeX format or MsWord format.

LaTeX style sheets, MSWord templates and more detailed information on the submission process can be found on the Acivs 2009 website (<http://acivs.org/acivs2009/>). All submissions will be reviewed by at least 2 members of the Program Committee; additional reviewers will be consulted if needed. The papers should provide sufficient background information and should clearly indicate the original contribution. They should state and discuss the main results and provide adequate references. Paper submission implies that one of the authors will present the paper if it is accepted.

Important deadlines

April 15, 2009 Full paper submission

June 15, 2009 Notification of acceptance

July 1, 2009 Camera-ready papers due

July 12, 2009 Registration deadline for authors of accepted papers

August 31, 2009

Early registration deadline

September 28 - October 2, 2009, Acivs 2009

Easics announces its new website



Easics has released its new website. It will be periodically updated with news

items, documents, job profiles, etc. The URL is <http://www.easics.com> ■



About Easics NV

Easics is an independent System-on-Chip design company, founded in 1991, and located at the Arenberg Science Park in Leuven, Belgium. Easics specializes in chip design using both digital & mixed-signal ASIC- and FPGA-technology. Easics' expertise and IP includes connectivity, hardware/software co-design, digital signal processing and low-power design. Easics' customer base consists of leading companies, active in industrial, measurement, consumer, wired & wireless telecom and medical markets.

Contact Information

Intelligent Environments come of age • p.1

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Reconfigurable Zero-IF Transceiver IP for SDR • p.3

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Easics and ICsense jointly support development of world's first high memory, passive UHF RFID chip by Tego, Inc • p.4

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Sundance builds out PXI Express Product Line with SMT712 • p.6

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IMEC launches research program to improve dynamic behavior of embedded systems • p.7

IMEC unveils tools to speed up design of energy-efficient multi-processor SoC platforms • p.8
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Mind provides services on Qt to enable improved user interface and application development • p.8

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Wireless Community: stay tuned on the technological evolutions in wireless communication • p.9

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ICsense appoints new Director of Marketing and Sales • p.10

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Easics announces its new website • p.16

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Embedded Corner • p. 11

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