

newsletter

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An introduction to Verum



Tools for building mathematically verified software

Setting the new paradigm for embedded software development

Verum's software tools enable complex concurrency and control errors to be discovered and eliminated early in the software development lifecycle. As a result, creators of embedded software are able to bring reliable products to market quickly, predictably and cost-effectively.

Guy Broadfoot and Robert Howe founded Verum in 2004 with the belief that there needs to be a better way to develop complex embedded software. Verum has developed a unique technology, Analytical Software Design (ASD). By dynamically modeling and

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An introduction to Verum



Guy Broadfoot



Robert Howe

formally verifying designs for completeness and correctness, ASD increases the predictability of the outcome of the software development process.

Verum has shown that its technology is viable for industrial scale challenges and achieved design wins with: Philips Healthcare, NXP Semiconductors, Philips Applied Technologies, NandaTech, ICT Embedded Systems, TTPCom etc. As a result, Verum has raised more than €3M of private funding to develop the ASD technology into a full professional software design product; ASD:Suite.

ASD:Suite

Verum's ASD:Suite software design toolset eliminates all behavioral defects from complex software designs, dramatically cutting the cost of software development, testing and maintenance. ASD:Suite automatic code generation further reduces the cost of software

development by 50% per delivered line of code. The key difference between Verum's ASD:Suite and tools that claim to improve productivity is Verum's Analytical Software Design formal verification technology: ASD allows the design of a software system to be mathematically verified as complete and correct, even before a single line of code has been written.

ASD:Suite has recently been adopted as a standard software design tool by Philips Healthcare CardioVascular division. At Hightech Mechatronica 2009 (12 March – Evoluon Eindhoven) Verum will launch the first full commercial release of ASD:Suite.

Who can benefit from ASD and the ASD:Suite?

Verum has established reference customers for its technology which include leading companies such as Philips Applied Technologies, and Philips Medical Systems. Through these projects we have demonstrated that ASD delivers produc-



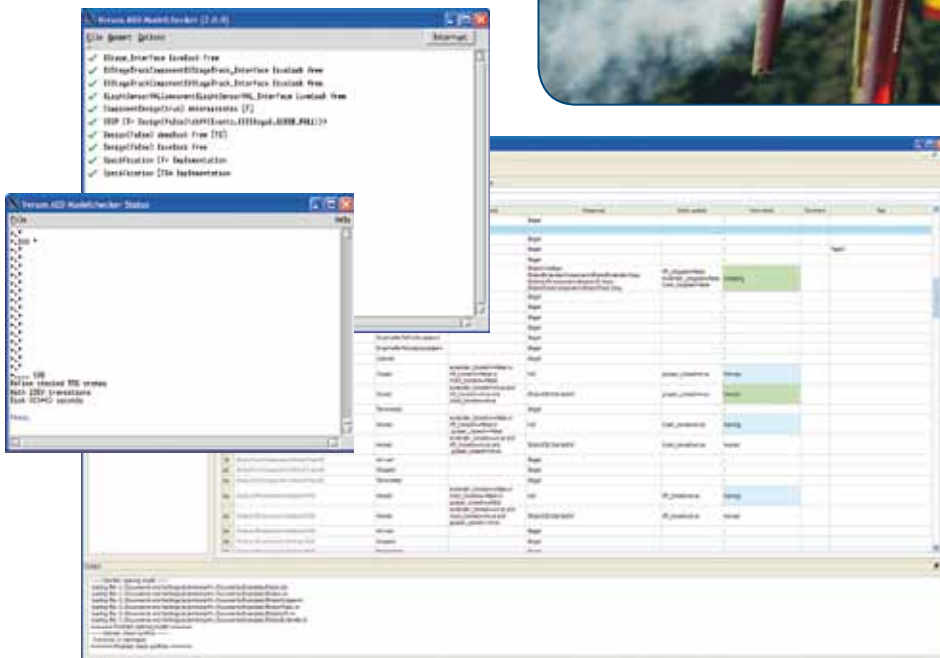
tivity increases from the conventional norm of 4-8 lines of delivered code per man-hour, to 13-80 defect-free lines of delivered code per man-hour.

End users of the ASD:Suite includes Software Architects, Designers and Requirement Engineers, from companies who are developing software for machines, equipment or system controls or similar behaviorally complex products. Other companies that can benefit from ASD:Suite are those that increasingly rely on distributed architectures based on multi-threaded and/or multi-cpu/ecu solutions who are facing problems that include spiraling development costs, lengthening time-to-market, increased field call costs and/or the inadequacy of conventional software development and testing methods.



Verum initially focused on the geographic area bounded by Eindhoven, Leuven and Aachen where there is

a high concentration of builders of complex systems and machines, for various markets including medical systems, semiconductor, automotive equipment, consumer electronics and telecommunication systems. Verum is now developing new markets beyond these in preparation for the launch of its ASD toolset early 2009. The coming years Verum will focus on expanding its market into other European high-tech areas.



Verum - Tools for building mathematically verified software



Actel announces Barco's DO-254 certifiable ARINC 429 IP Core targeted to ProASIC3 FPGAs

Actel Corporation (NASDAQ: ACTL) announced that the Barco Silex BA511 ARINC 429 IP core, targeted for Actel's ProASIC®3 FPGAs, has been DO-254 certified through implementations in multiple safety-critical avionics applications.



Actel's ProASIC3 A3P1000 devices, featuring Barco's BA511 ARINC 429 IP core, were selected for a total of four DO-254 certified implementations in commercial aviation programs, including two at the highest Design Assurance Level (DAL-A), and two at the second highest level (DAL-B).

"In contrast to SRAM-based FPGAs, Actel's ProASIC3 FPGAs have inherent low power consumption and are immune to neutron-induced configuration upsets also known as firm errors," said Ken O'Neill, Actel Director of High Reliability Product Marketing. *"The selection of ProASIC3 FPGAs for use in safety-critical commercial avionics programs underscores their high reliability."*

DO-254 is a design assurance guideline intended to ensure that commercial aircraft avionics systems are designed in a manner consistent with the safety-critical nature of the application. The

criticality of a design is assessed in terms of its Design Assurance Level. There are five DAL categories, with A being the most safety-critical. DO-254 certification is required on all major aircraft programs currently in development, for example Airbus A350, Boeing 787 and retrofits to B747 and B777 aircrafts.

ARINC-429 is an industry-standard communications interface used in the commercial avionics industry for handling command and control signals between electronic systems on board commercial aircraft.

ARINC 429 in ProASIC3

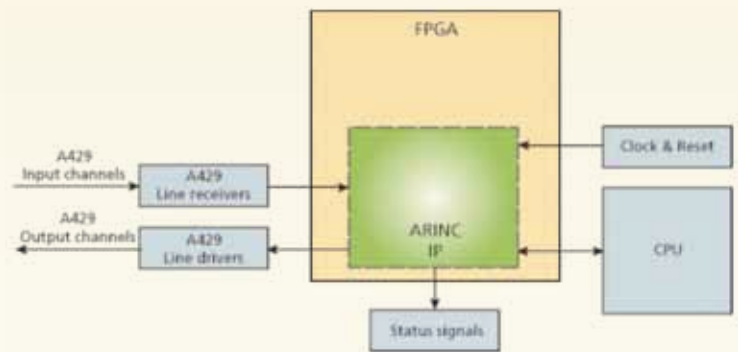
"Actel's reliable platform, together with our DO-254 ARINC-429 design and documentation suite, offers our customers a time-to-market solution with required quality to support life-critical applications," said Didier Secnazi, Sales Manager at Barco Silex. *"Our BA511 design flow methodology fulfills the RTCA/ED-80 guidelines, which are required by the Airworthiness Certification Authority for developing*

About Actel

Actel is the leader in low-power and mixed-signal FPGAs, offering the most comprehensive portfolio of system and power management products. Power matters.

About Barco

Barco, a global technology company, designs and develops visualization products for a variety of selected professional markets. Barco has its own facilities for Sales & Marketing, Customer Support, R&D and Manufacturing in Europe, North America and Asia Pacific. Barco (NYSE Euronext Brussels: BAR) is active in more than 90 countries with about 3600 employees worldwide. Barco posted sales of euro 747 million in 2007.



ARINC429 in ProASIC3

hardware to be certified for use in commercial aircraft equipment."

About Barco Silex

Barco Silex, is an electronic design subcontractor (ASIC, FPGA, DSP, Board) that belongs to the Belgian Barco electronic group. To provide customers with the most reliable and highest standard designs, a design methodology based on a set of stringent rules and recommendations, has been set-up. Thanks to this, Barco Silex has been selected by the market leaders in the aerospace industry for design projects requiring the DO254 design assurance guideline. Additionally, its design expertise is made available through a wide portfolio of in-house developed IP cores for ASIC and FPGA, with focus on high performance memory controllers, encryption and image processing.

In this risk-averse design environment, the availability of the Barco BA511 ARINC 429 IP design artifacts minimizes risk, time and effort, saving designers from either developing the design artifacts themselves or having to develop their own ARINC 429 interface designs for flight-critical or safety-critical applications requiring DO-254 certification. ■

DSP Valley welcomes Bart De Loore, new Managing Director NXP Belgium

After working over 20 years abroad Bart De Loore returns to work in Belgium.



Bart De Loore

Bart: "It feels a bit like coming home. I run into many people I studied or worked with early in my career. I find Leuven an extraordinary city, a melt of historical charm, student spirit and world-class innovation.

I am looking forward to my new role. The NXP team in Belgium has a strong reputation in the company and the industry. They have all it takes to create significant value for NXP and its customers."

What do you believe are critical success factors in a Semiconductors R&D environment, and how is NXP Belgium positioned?

Bart: "Technology leadership is the cornerstone of our success. As a technology company, we need to have world class experts in the domains we target. NXP Belgium has such experts in our competence and application domains: device physics, process technology, systems security, car infotainment and telematics, wired and wireless connectivity, sound and acoustics, ultra low power solutions. These experts are surrounded by a skilled engineering team, able to translate innovative concepts into products. Our competences span the spectrum from device physics to SW and Systems.

Personal data

Bart De Loore
 Born in Gent, 1960
 Married, 4 children
 Electronic Engineering Masters, KU Leuven
 Postgraduate Business administration, Vlekho Brussels

All of our R&D teams enjoy a strong link with customers and markets which focuses our innovation, and increases effectiveness. Illustrative for this is the cooperation with Swiss-based Phonak to develop a single chip ultra low power radio for use in Hearing Aid Systems.

I believe new business opportunities are most likely to develop at the touch-point of complementary competences. We are ideally situated in the Leuven ecosystem, with renowned institutes like Katholieke Universiteit Leuven and IMEC, and a rich variety of established and start-up electronic companies in the region.

Finally, we do have entrepreneurs in the team that are able to uncover and develop new business opportunities. They are indispensable to fuel growth."

What is the role of DSP Valley and how will you be involved?

Bart: "I expect DSP Valley to help us turn the passive ecosystem into an active network, thereby uncovering new business opportunities.

While the primary focus was on the Flemish region, DSP Valley is now extending its reach abroad. As NXP's representative at the Board of Directors, I will

encourage and support DSP Valley to accomplish this mission."

Triggered by the world-wide economic crisis the IC industry is in a severe downturn. How is NXP Semiconductors going to pull through?

Bart: "With today's fierce competition and huge R&D investments, only the top vendors are able to create a healthy return. After the spin-off of its Wireless business (mid 2008) NXP already holds number 1 or 2 positions in more than 75% of its businesses. We will continue to pursue our objective of gaining and sustaining leadership positions in our focus markets.

On the costs side NXP launched its Redesign program in September 2008. After the spin-off of our Wireless business, we had to tailor the manufacturing and R&D footprint to the changed scope of the company.

I am confident NXP will weather the current industry downturn and emerge stronger with mostly leading market positions in our key businesses in automotive, identification, home applications and multi-market semiconductors.

Every week NXP announces new technological breakthroughs and launches new products that reconfirm our reputation as one of the innovative leaders in the IC industry. NXP Belgium has brought invaluable contributions to those success stories, and will continue to do so.

I am proud and eager to work with this team of over 170 professionals that make this happen." ■

Key numbers NXP

NXP is a leading semiconductor company founded by Philips more than 50 years ago. Headquartered in Europe, the company has about 33,500 employees working in more than 20 countries and posted sales of USD 6.3 billion (including the Mobile & Personal business) in 2007.

AnSem NV, the analog and mixed-signal IC design house, has announced the appointment of Pierre Blondeau as Marketing & Sales Manager and Joan Ceuterick as Project Manager.



Pierre Blondeau and Joan Ceuterick

Pierre Blondeau will be responsible for business development, marketing & sales for AnSem's OEM segment. Having previously worked for AMI Semiconductor, Alcatel, Barco and, more recently, as Sales & Marketing Manager for the Benelux at ON Semiconductor, Pierre has a strong background in large customer account management. This experience, together with his knowledge of the industrial and medical markets, will enable Pierre to grow AnSem's OEM business and to better serve AnSem's growing customer base.

AnSem strengthens its management team with the appointment of a Marketing & Sales Manager and Project Manager

Joan Ceuterick will be responsible for project management and business development in the wireless segment. Joan brings with him 18 years' experience in the semiconductor industry, with particular emphasis on wireless product management, having previously held marketing and sales positions at National Semiconductor, InnoCOM Wireless, Austria Mikro Systeme and Thesys (now Melexis and XFAB) and, more recently, AsicAhead, where he was Managing Director.

"In order to drive AnSem's continued growth and remain the design house that continually delivers next generation ASICs and IPs, we require a stronger management team," said Stefan Gogaert, CEO of AnSem. *"These two key appointments will strengthen our position in the wireless, medical and industrial markets — Pierre Blondeau, with his experience in the industrial and medical markets, and Joan Ceuterick, with his long experience of wireless product marketing."* ■

About AnSem

AnSem is a fabless IC design company, founded in 1998. Specializing in the state-of-the-art design of high-performance analog and mixed-signal integrated circuits in the most advanced technologies, AnSem offers design services and products for wireless communication, high-speed data communication and data acquisition. AnSem provides cost-effective turnkey solutions using the latest technology with emphasis on best time to market. The company is based in Leuven, Belgium, home to Europe's DSP Valley technology network organization, and is a member of the DSP Valley and the Global Semiconductor Association (GSA)

TASS Belgium offers new services: expert consulting and solutions

In addition to its flexible staffing services addressing capacity needs or needs for general embedded expertise, TASS is now also offering broader services to its customers.

TASS
software professionals

Dedicated to make it work.

One service type is expert consulting. We see an increasing demand for our help when customers are facing "deep embedded" problems (for instance, critical issues with an embedded Linux kernel or drivers). It is often a matter of inter-

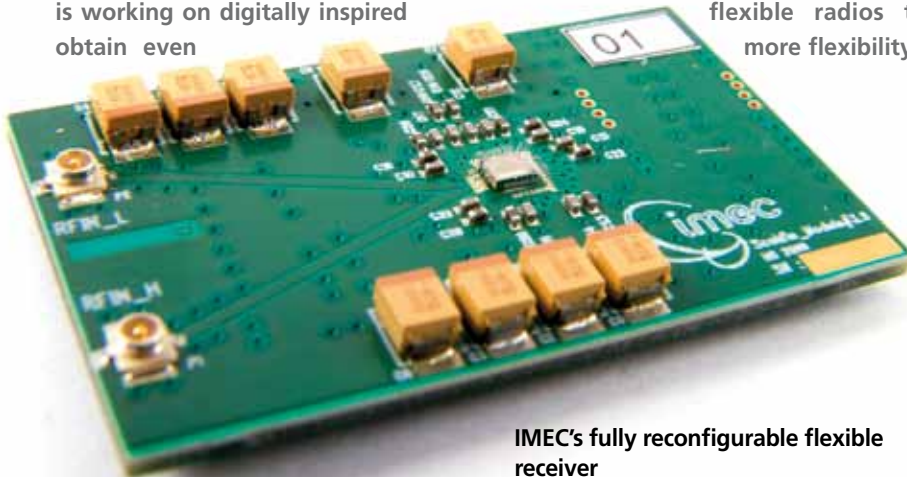
ventions of a small number of days, but the consultant has to be a recognized expert in the matter at hand. TASS has a number of senior engineers with this deep expertise, and can make them available for these short interventions.

Example domains are embedded Linux, hard real-time requirements, or embedded software process auditing.

The other service type is solutions. In this case, customers hand over a problem to TASS, and TASS develops a solution in its own embedded lab. These solutions can be software-only (like setting up a new embedded platform with the required peripherals), or they can involve combined hardware-software packages (like developing a car dashboard display module, or a USB module for a medical device). In the latter case, TASS can rely on its partnerships with other players in the broader embedded field (see www.embinet.be) to offer the complete solution. ■

IMEC matures reconfigurable transceiver technology and prepares for digital flexible radio

With the launch of its single-chip reconfigurable receiver achieving industry state-of-the-art performance, IMEC matures its flexible radios in deep sub-micron digital CMOS to ease the implementation of both the analog and the digital functionality into the same system-on-chip (SoC). The architecture optimally benefits from the high transition frequency offered by deep submicron CMOS scaling resulting in low cost, low power radios. In parallel, IMEC is working on digitally inspired flexible radios to obtain even more flexibility.



IMEC's fully reconfigurable flexible receiver

At the International Solid State Circuit Conference, IMEC presented its 45nm single-chip reconfigurable receiver with power, performance and area competitive to state-of-the-art single mode radios. The receiver is fully software configurable across all channels in the frequency bands between 100MHz and 5GHz. The IC uses only 1.1V supply voltage and has an active area of 2mm². Depending on

its configuration it consumes from 54 to 105mA. The radio can be configured for multiple state-of-the-art and future wireless protocols such as GSM, GPS, EDGE, WCDMA, HSDPA, CDMA2K, EVDO, LTE, 802.11ab/gn, DVB-H and 802.16d/e. Its high level of integration and ultra-low power consumption make it suitable for use in a wide range of both single and multi-mode mobile devices – handsets,



smart phones, PDAs, PC cards, USB dongles, etc.

The complete transceiver will be taped out in April 2009. Industry can get a head start for their mobile devices of 2011, by joining IMEC's reconfigurable radio research program in which they get access to the technology and build up early knowhow on the transceiver.

At ISSCC2009, IMEC also presented a new architecture for a multi-mode multi-rate cascade sigma-delta low-pass analog to digital convertor (ADC) in 90nm digital CMOS. The ADC achieves a dynamic range of 85 to 66dB for GSM, Bluetooth and UMTS with power consumption of only 3.4 to 6.8mW showing the intrinsic power efficiency of the architecture without specific circuit optimization. *"This achievement indicates the move to more digitally-inspired flexible radios;"* said Rudy Lauwereins, Vice President Smart Systems Technology Office at IMEC. *"Step by step we are removing scaling unfriendly analog building blocks and replacing them by digital implementations making the radio even more flexible."*

Going one step further IMEC also reported a prototype RF band-pass sigma-delta ADC with a bandwidth of 60MHz at 2.4GHz. With this architecture, ultimately, the analog to digital conversion would be placed at the antenna shifting all signal conditioning to the digital. *"Currently the performance is not yet sufficient but we have a clear roadmap towards the dream of digital software radios,"* said Rudy Lauwereins. ■

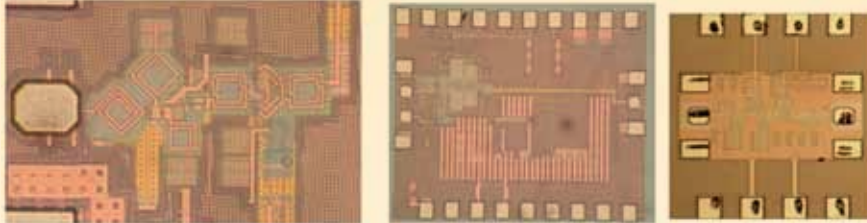
About IMEC

IMEC is a world-leading independent research center in nanoelectronics and nanotechnology. IMEC vzw is headquartered in Leuven, Belgium, has a sister company in the Netherlands, IMEC-NL, offices in the US, China and Taiwan, and representatives in Japan. Its staff of more than 1750 people includes about 600 industrial residents and guest researchers. In 2008, its revenue (P&L) was estimated to EUR 264 million.

IMEC's More than Moore research aims at semiconductor scaling towards sub-32nm nodes. With its More than Moore research, IMEC looks into technologies for nomadic embedded systems, wireless autonomous transducer solutions, biomedical electronics, photovoltaics, organic electronics and GaN power electronics. 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 worldwide position IMEC as a key partner for shaping technologies for future systems.



IMEC reports low-cost low-power 60GHz solutions in digital 45nm CMOS



Pictures of IMEC's 45nm 60GHz ICs: receiver front-end (left), PLL (middle) and power amplifier (right).

At the International Solid State Circuits Conference, IMEC presented a 60GHz front-end receive chain, phase-locked loop and power amplifier in 45nm digital CMOS technology. These building blocks pave the way to second-generation 60GHz radios by 2010 which will rely solely on plain CMOS, true one-chip solutions. IMEC also demonstrated multi-gigabit per second wireless communication with its 60GHz module that integrates IMEC proprietary antenna and antenna interface with its 45nm multiple antenna RF front-end chip.

IMEC is developing single-chip 60GHz radios using advanced digital CMOS technology. The RF part optimally benefits from the high transition frequency offered by deep submicron scaling. 45nm digital CMOS also allows to achieve the high speed, low power consumption and low area specifications for the digital part. By developing beamforming solutions with a phased antenna array approach, IMEC overcomes the low signal-to-noise performance from which 60GHz silicon-based radios typically suffer.

A first major breakthrough, presented at ISSCC, is the realization of a digitally

controlled 57-66GHz receiver RF front-end in 45nm digital CMOS with a noise figure of only 6dB. Its small area of only 150x150 μm^2 , its low power consumption of 19mA at 1.1V supply voltage, and full-digital control makes it highly suitable for phased-array systems.

Next, IMEC presented a fully integrated 57-66GHz phase-locked loop (PLL). The PLL, which outperforms all previous designs in terms of tuning range, is the first to provide quadrature output phases at mm-wave frequencies, such that it can be readily used in a zero-IF architecture. The circuit consumes only 78mW at 1.1V supply voltage.

"Based on the presented results we can realize uncompressed high definition video distribution with 16 antenna paths over 10 meter range with a power consumption of only 1.6W for the complete receiver" said Rudy Lauwereins, Vice President Smart Systems Technology Office at IMEC.

Finally, IMEC reported a world-first mm-wave power amplifier in 45nm digital CMOS with state-of-the-art output power and adequate ESD protection. The

push-pull power amplifier features a 1dB compression point of 11dBm between 50 and 67GHz at 1.1V supply voltage.

"Industry is reluctant to design 60GHz circuits due to the major challenges related to this mm-wave part of the RF spectrum. These excellent, first time right, 60GHz designs in 45nm CMOS show IMEC's expertise in 60GHz design and the potential of our design methodology," said Rudy Lauwereins. *"We invite industry to join our 60GHz research program to benefit from this knowledge and from IMEC's advanced heterogeneous integration technologies enabling second generation real single-chip 60GHz radio solutions by 2010."*

What's more, IMEC has also integrated its 45nm multiple antenna RF front-end chip together with IMEC proprietary antennas and antenna interface using PCB technology. The performance of this module has been demonstrated in a wireless setup validating IMEC's baseband processing algorithms for IEEE15.3c compliant reception. ■



Integration photo of 45nm RF front-end IC with antenna and antenna interface.

Every Crisis brings new Opportunities

The world is being shaken by an important economic downturn, primarily being fired by troubles in the financial sector, but cascading to other, investment sensitive sector, probably sustained by the fear of the people to spend money – or by the difficulty to obtain money for investments. Although the impact is severe, and although many companies are suffering, this climate also offers fresh opportunities for the healthy organizations.

For what concerns the human resources aspects, some companies have to reduce their workforces, not only in production divisions, but also in the research and development labs. On the other hand however, this represents an opportunity for the healthy organizations, to find the unique researchers or development

Peter Simkens
Managing Director, DSP Valley

Preface

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Software Technology for Adaptable Distributed Middleware (STADiUM)

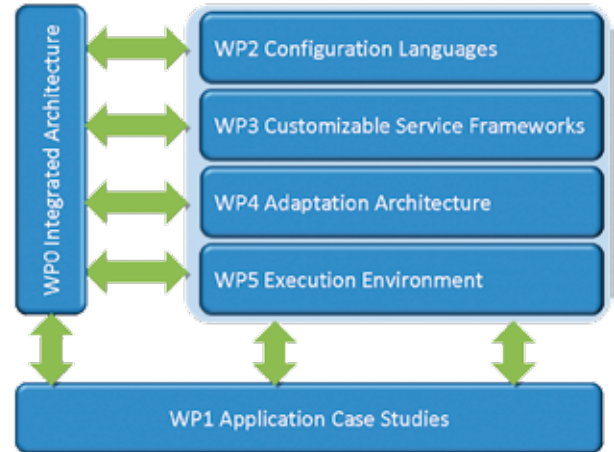


Description

Contemporary distributed software systems have become extremely heterogeneous, dynamic and large-scale; they may include backend servers, regular PCs, various mobile and ubiquitous devices, plus diverse network infrastructures, such as mobile ad-hoc and wireless sensor networks. The STADiUM project addresses this complex context and investigates a next generation management platform that is adaptable to various operational conditions and available system resources. The platform will be based on a

middleware architecture that embraces adaptation, a set of reusable service frameworks at the device as well as the distribution level of the middleware, and a family of configuration languages.

Research



Project title	Software Technology for Adaptable Distributed Middleware (STADiUM)
Goal	Designing a next generation middleware platform that is adaptable to various operational conditions and available system resources.
Academic Partners	K.U.Leuven/DistriNet IMEC/Nomadic Embedded Systems (NES) VUB/PROG
Contact person	Sam Michiels (sam.michiels@cs.kuleuven.be)
Website	http://distrinet.cs.kuleuven.be/
Due date	31/12/2012

Industrial partners / User committee

Alcatel-Lucent, De Lijn, DSP Valley, DUO, Essensium, H.Essers, IDxS, IBM, iCity, Inno.com, LMS, NIKO, Porthus, Punch Telematix, RMONI, TASS

Embedded Linux for SMEs (Embedded Linux voor het MKB)

Description

'Embedded Linux voor het MKB' is the follow up on a previous investigation around the needs of SMEs regarding faster development with the aid of Embedded Linux. This quickscan, performed by members of the knowledge group 'Architecture Of Embedded Systems' of Fontys University ICT, showed that SMEs are willing to start new applications with Embedded Linux but they need better insight information on development, performance and product costs. This includes setting up host and target platforms for development, integrating build, design and verification tools in a structured way. Besides that, they are in need of examples showing the strengths of Embedded Linux in comparison to their normal development (this includes simple 8 bit controllers, but

Project title	Embedded Linux for SME
Goal	Make Embedded Linux available for SME. This includes a systematic approach to Embedded Linux development (including build tools, design and verification tools) and practical applications in the field of Real-time, Industrial and Mobile applications.
Academic Partners	Fontys University, Lectorate Architecture Of Embedded Systems Embedded Systems Institute Karel de Grote Hogeschool
Contact person	Ruud Ermers, PhD R.Ermers@fontys.nl
Website	www.fontys.nl/embeddedsystems/embeddedlinux
Due date	Start: 01/08/2008, End: 31/07/2010

also Windows Embedded), especially in the field of real-time, industrial and more common I/O based applications.

Research

We are setting up a full range of Open Source tools which cover the above mentioned fields, in particular the inte-

gration of kernel development, IDE, build tools and design tools, based on Eclipse. These are targeted to some specific target platforms, like ARM7/ARM9. Besides that, we will give a full overview (WIKI) of Embedded Linux related activities like version management, differences in real-time approaches currently available on

SCALA: System Convergence in Applications of Location Awareness

Description

In the context of 'Ambient Assisted living', location information greatly expands a system's possibilities. Several (indoor) RF-localization techniques exist, but integrating them into applications is challenging because of the differences in accuracy, hardware, required input, output ... amongst them.

For easier integration, a convergence layer will be developed, allowing a uniform and transparent communication between the different available RF-localization techniques on one side and the application on the other. Furthermore, this layer will allow the selection of one, or the combination of several RF-localization techniques (where available), making the location information, optionally aided by extra context information from the application or additional sensors, more accurate.

Research

The project will be spread over 4 work packages. In the first package, the available localization technology will be studied (This can mainly be done by means

of the results from the previous LADI WITEPA project). In the second phase, the needs of the different heterogenous localization techniques for the convergence layer will be determined, resulting in the development of a first version of this layer. The third phase consists of the implementation of this first version in a number of field tests. The outcome of these tests will help in the further development of the convergence layer. In the fourth and final package, the project results will be made available to the industrial partners and the academic

world through a variety of channels e.g. workshops, lectures...

Industrial partners / User committee

52M, Alcatel-Lucent, AZ Sint-Lucas, Belintra NV, DSV Solutions Automotive NV, Deltronic, Greenpeak Technologies NV, Lumiad, Meyvaert NV, Myriade NV, Niko NV, Belgacom Mobile, The 8ight Day BVBA, Televic, Transics international NV, Coso Softec BV, Triple Helix BVBA IBBT, IMEC, DSP Valley, IWT

Project title	SCALA: System Convergence in Applications of Location Awareness
Goal	Closing the gap between RF positioning technologies and end-user applications, enabling a faster and easier development of applications of location awareness.
Academic Partners	UAntwerpen, K.U. Leuven, Artesis, KaHo Sint-Lieven
Contact person	DraMco: Lieven De Strycker, lieven.destrycker@kahosl.be Jean Pierre Goemaere, jeanpierre.goemaere@kahosl.be e-lab: Luc Pieters, luc.pieters@artesis.be Frederik Schrooyen, frederik.schrooyen@artesis.be
Website	www.dramco.be
Due date	31/09/2010

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Linux, uclinux and graphical toolkits for small devices. Applications under consideration are real-time research (using brushless DC motor, including dual-core implementation), rich peripheral applications using USB, Bluetooth, Ethernet, IDE etc. on ARM platform, combination of Embedded Devices with graphical support, remote sensing and servicing.

Industrial partners / User committee

Contronics, Quality-Products, T-Dose, Advantronics, ECCT, Hotraco, van Mierlo, Robopharma, NBG, NXP Semiconductors, Vanderlande Industries, Actemium, KSE, Sioux, Embedded Systems Institute, Embedded House, DSP Valley

engineers with specific skills; they have been seeking for since many months. The relief of pressure on the HR market indeed is an opportunity for these growing and innovative companies to strengthen their R&D forces.

In its turn, the availability of these highly skilled research and development engineers may cause another cascade effect – but luckily a cascade that creates an upward spiral leading away from the economic crisis. Indeed, by attracting additional researchers or developers, these innovators can strengthen their position compared to competitors, by continued innovation, new product development and product amelioration. By creating new and better products, these innovators can take over market share of their suffering colleagues.

In this process, it might happen that still some competencies or skills are missing. This is where also the network connections to other research institutes and development and engineering services can fill the gap. This is why networking, walking hand in hand with internal innovation, should be embraced, even more than before, in these difficult times of economic downturn. Therefore, DSP Valley will offer even more networking opportunities in 2009, adding matchmaking and brokerage events in the international and European scene to the offered services. In order to take all upcoming opportunities to tackle the crisis, we kindly invite you to actively participate in our networking events.

Peter Simkens
Managing Director, DSP Valley

Camera System for Elderly Fall Detection



Description

This project focuses on building and validating a camera system for fall detection of elderly people that live at home. The system will be installed in several rooms of the house of an elderly person with an increased fall risk. This system is responsible for alerting a caregiver when a fall incident occurs.

Research

In this project we will build a (prototype) fall detection camera system and validate it with real elderly people with an increased fall risk. To do this we will do successively:

- set up an experimental vision system that is capable to capture a large part of the house;
- build a database of labeled images sequences, consisting of fall movements simulated by actors as well as observed real fall movements of elderly people
- implement, test and refine existing



algorithms for fall detection based on available literature, while using the recorded database

- implement this algorithm on a prototype embedded platform so that the images can be processed in real-time, while keeping cost and power consumption as low as possible
- execute detailed experiments with this prototype, observing elderly people

with a high fall frequency for long time durations.

Industrial partners / User committee

Televic, Vision4S, XenICs, Commeto, IMEC, Fysim, In-Ham, Bejaardenzorg Grauwzusters Limburg, Wit-Gele Kruis, Familiehulp, Niko, Microtron, Dedicated Systems, InewIT, IBBT, DSP Valley. ■

Project title	Camera System for Elderly Fall Detection
Goal	Design and real-life testing of a system giving an alarm if home-staying elderly person falls, based on camera input.
Academic Partners	EMSD - De Nayer Institute, Mobilab – Katholieke Hogeschool Kempen,
Contact person	Toon Goedemé, toon.goedeme@denayer.wenk.be
Website	www.fallcam.be
Due date	01/11/2011

STRES: Secure Techniques for Remote configuration of Embedded Systems



Description

Embedded systems found their way into many domestic and industrial applications. This has led to specific challenges concerning after sales services and system upgradeability. Thanks to the presence of broadband technology new opportunities have arisen to deal with the product life cycle more efficiently. For this reason three main principles are integrated in such systems: remote status checking, remote problem solving and remote upgradeability.

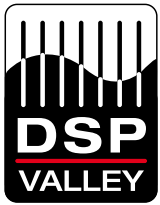
There is however an important shortcoming concerning data confidentiality, data authenticity and entity authenticity. To guarantee a minimal security level, a

Project title	STRES: Secure Techniques for Remote configuration of Embedded Systems
Goal	1. definition of a general framework for adding secure remote configuration to an embedded system 2. implementation of a general test setup as well as a specific test case
Academic Partners	Katholieke Hogeschool Limburg, Erasmushogeschool Brussel, Katholieke Universiteit Leuven
Contact person	nele.mentens@iwt.khlim.be abdellah.touhafi@docent.ehb.be
Website	http://www.embeddedsecurity.be
Due date	31/12/2010

protected communication protocol for remote configuration of embedded systems becomes necessary. For this reason some (architectural) implementation premises must be foreseen on the sender and receiver side of the data. It is impor-

tant that techniques for remote configuration are sufficiently secure and have a low integration cost. In this project we try to combine these two challenges.

How to develop a coding standard for an embedded project?



On December 3rd 2008 DSP Valley organized a seminar about coding standards for embedded software at the High Tech Campus in Eindhoven, The Netherlands. Seven presentations from industry experts and two companies showing product demos were the ingredients for this technical seminar. About 55 people registered for the seminar and took the opportunity to learn from and to network with colleagues.

Jonathan Moore from Mira Ltd explained the need for defining a programming language subset. He elaborated on the history of the MISRA guidelines and its relation to the IEC 61508 standard. The MISRA-2004 has 122 required rules and 20 advisory rules that are organized in 21 categories. MISRA C++ was published in June 2008. MISRA Autocode set the guidelines for the model based development and automated code generation, which is now "state of the art" in

automotive. Common themes have emerged between these three widely-used language subsets. This entails new guidance on generic language issues and that harmonization between the documents is needed.

Kees Lepoeter explained how the MISRA-C coding standard has been deployed in NXP Semiconductors as a foundation for the software quality program. The coding standards are recognized by the top management as part of the software quality initiatives deployed and monitored NXP-wide.

Jan Verbeke from Philips Consumer Lifestyle in Bruges showed how static code analysis helps to increase software quality, reduces the field call rate and hence reduces the cost of non quality which is especially important when you deal with mass volume production. An important issue is how to manage the complexity. In Bruges they redefined the categories of warning and errors that come out of the tool to cope with complexity and flexibility. With an own web based reporting application there is an overview for all projects, branches and applications.

Wouter Cloetens from SoftAtHome gave a more general overview of the software development process at his company where the development group has grown very fast in the last year. Tracking a functional problem in the device down to the piece of software code containing an error and fixing it does require solid way-of-work. Especially a good version control system supporting build integration is important and it can become very complex when several project branches exist. Your own coding standards can not be applied to third party software.

Randy Marques from ATOS Origin Technical Automation indicated where the ISO C-99 standard fails. There is

What is this ?

```

> /* Wooooops... */
> #define RLC_MOD_N_COMPARE(_n1, _n2, _b1, _b2, _N)
> \
> ( ((_n1) == (_n2))
> ? 0 : (( _b1) <= (_b2))
> ? (( _n1) - (_n2)) : ((( _b1) <= (_n1) && (_b1) < (_n2)) || \
> (( _b1) <= (_n2) && (_b1) < (_n1)) || \
> (( _b1) > (_n2) && (_b1) > (_n1))) \
> ? (( _n1) - (_n2)) : (( _n1) > (_n2)) \
> ? -(( _n2) + (_N) - (_n1)) \
> : (( _n1) + (_N) - (_n2)) \
> )

```



the famous appendix F in the ISO C-90 standard which contains 201 items divided into unspecified behavior, undefined behavior, implementation defined behavior and locale specific behavior. Annex J of the ISO C-99 standard even contains 384 items. But also compilers can contain bugs since they are 'just programs' written by programmers. Comparing the PDSL coding standard with the MISRA-C coding standard shows that most of the rules of both standards cover the same. His final remark was that having a coding standard will not improve the quality of the code.

Frank van den Beuken from Programming Research explained the ISO 9126 quality model. In that model one can distinguish internal quality which is measured on the source code, external quality which is based on the run-time behavior of the system and quality in use to see if the system fulfills the user goals and requirements. With three case studies he illustrated the correlation between coding standard compliance and software quality.

The last speaker was Paul Jansen from TIOBE Software who first explained how the TICS framework is an independent layer between the company's code quality metrics and the different code checking tools from third parties. He then presented 11 rules to ease the task to keep coding standards alive in software development group.

If you missed the opportunity to be there but you would like to know more about the presentations please contact Filiep Vincent.

Research

- WP1: Cryptographic algorithms and protocols
- WP2: Secure architectures
- WP3: Implementation of the algorithms and protocols
- WP4: Implementation of a test board
- WP5: Implementation of a test case
- WP6: Implementation of the Central Reconfiguration Unit (CRU)
- WP7: Technology dissemination and valorization

Industrial partners / User committee

CQ-LIN, Dedicated Systems Experts, DSP Valley, Easics, Intrinsic-ID, Ir.deto, L-SEC, Niko, NXP Semiconductors, Open License Society, Q-Star Test, Televic, Xilinx ■

Embedded World 2009



<http://www.embedded-world.de>

Nürnberg, Germany
March 3-5, 2009

DSP Valley and its members will be present with a group booth on the Embedded World Exhibition & Conference. It is Europe's biggest exhibition of its kind and the meeting-place of the interna-

tional embedded community. Embedded technologies are in action everywhere - whether in the car, data and telecommunication systems, industrial and consumer electronics, military systems or aerospace. In 2008 675 exhibitors showed the full range of products for embedded technologies and 17000 trade visitors from all

over the world gained an insight into the latest trends in embedded technologies. DSP Valley together with its following members: Association Ghent University, Barco Silex, Dekimo, Easics, Essensium - Mind, /k/ Embedded Java Solutions are looking forward to meet you on booth 12-560.

Embedded Systems Conference - Silicon Valley

<http://www.cmp-egevents.com/web/esv>

McEnery Convention Center, San Jose, CA, U.S.A.
March 30 - April 3, 2009

The world's largest international embedded event and technical conference. ESC is a truly global technical conference bringing together the world's technology experts from over 16 different countries.

It provides in depth technical training for engineers, relatively new to embedded design, all the way up to courses on cutting-edge technology applications and solutions for the most experienced designers.

By attending ESC Silicon Valley you will have the opportunity to meet face to face with strategic suppliers, discover

Learn today. Design tomorrow.



new products and solutions to your most pressing design challenges.

DSP Valley will be present at the exhibition together with IMEC and NXP Semiconductors Belgium on booth 1535.

DATE 09

Design, Automation and Test in Europe
Nice, France
April 20-24, 2008



The 12th DATE conference and exhibition is the main European event bringing together designers and design auto-

mation users, researchers and vendors, as well as specialists in the hardware and software design, test and manufacturing of electronic circuits and systems. It puts strong emphasis on Ics/SoCs, reconfigurable hardware and embedded systems, including embedded software.

DSP Valley will be present at the show. You can visit us at booth C21; on this booth also Easics, IMEC, Q-Star Test and Sigasi will show their technology. Also Target Compiler Technologies will have a booth (C5) in the close vicinity of DSP Valley.

<http://www.date-conference.com>

Contact Information

An introduction to Verum • p.1

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Actel announces Barco's DO-254 certifiable ARINC 429 IP Core targeted to ProASIC3 FPGAs • p.3

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DSP Valley welcomes Bart De Loore, new Managing Director NXP Belgium • p.4

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AnSem strengthens its management team with the appointment of a Marketing & Sales Manager and Project Manager • p.5

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TASS Belgium offers new services: expert consulting and solutions • p.5

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IMEC matures reconfigurable transceiver technology and prepares for digital flexible radio • p.6

IMEC reports low-cost low-power 60GHz solutions in digital 45nm CMOS • p.7

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Embedded Corner • p.8

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