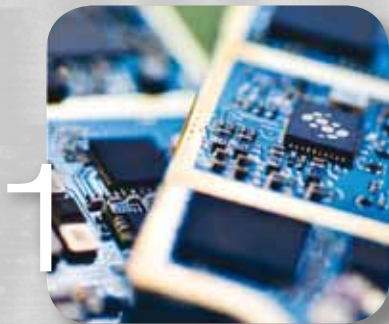


newsletter

5

Verantw. Uitg.: Peter Simkens • DSP Valley vzw. - Gaston Geenslaan 9 - 3001 Leuven (Belgium) • tel. +32 (0) 16 24 14 40 • fax +32 (0) 16 24 14 49 • www.dspvalley.com

In this issue



1

Preface

- ▶ DSP Valley goes medical

Technology Flash

- ▶ ST-Ericsson – supplying wireless platforms and semiconductors to the world's leading device makers
- ▶ Using Multi-Gigabit Transceivers to Test and Debug FPGA

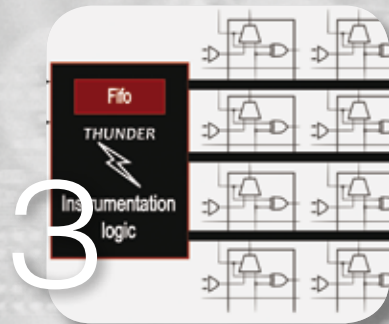
In the Spotlight

- ▶ Verum's design contest inspires software engineers
- ▶ Sigasi promotes floating licensing for teams
- ▶ AnSem announces the appointment of Dirk Logie as CEO
- ▶ Septentrio has reinforced its team

Embedded Corner

- ▶ Static Code Checking with MISRA-C 2004 Coding Guidelines

Upcoming Events



3



4



5

2
2
1
1
3
4
4
4
5
5
4
6
7

ST-Ericsson – supplying wireless platforms and semiconductors to the world's leading device makers

ST-Ericsson is an industry leader in design, development and creation of cutting-edge mobile platforms and semiconductors across the broad spectrum of wireless technologies. The



company is a key supplier to the leading handset manufacturers, as well as to other key industry players, such as mobile operators and manufacturers of dongles, laptops and other connected devices. One in three mobile phones sold in 2010 was powered by ST-Ericsson's technologies.

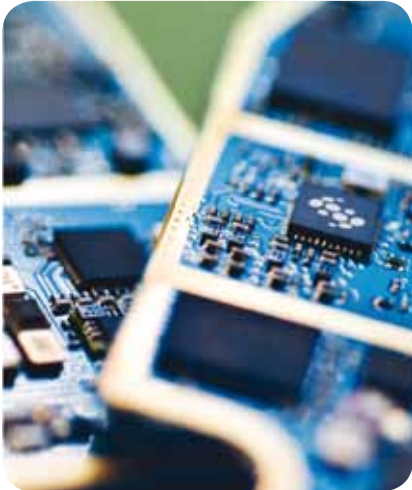
Technology and innovation

ST-Ericsson is innovation-focused, with the vast majority of its employees working in research and development. The company is backed by the strongest

Intellectual Property Rights (IPR) portfolio in the wireless industry through its parent companies – Ericsson and STMicroelectronics. ST-Ericsson drives

continuation on page 2

continuation from page 1



development in a series of wireless access technologies and has been the first to market with LTE platforms. It is also at the forefront of the development of multicore processor platforms, which will enable mobile phones and tablets to achieve PC-like performance without jeopardizing battery life.

With one of the most extensive Interoperability Testing (IOT) and Field Trial programs in the industry, ST-Ericsson helps customers decrease time-to-market and achieve predictable field performance.

Partnerships with leading manufacturers

Collaboration is in the DNA of ST-Ericsson. The company has long-standing relationships with global



mobile phone manufacturers, spanning more than 15 years.

In addition, ST-Ericsson has strong partnerships with China-based handset manufacturing companies that are using its mobile platforms, including industry-leading solutions for the TD-SCDMA standard.

Complete solutions

ST-Ericsson is unique in its ability to deliver state-of-the-art platforms, integrating mobile multimedia and connectivity for GSM, EDGE, WCDMA, HSPA, HSPA+, as well as TD-SCDMA and LTE. The company's multimedia and application processors support major open smartphone operating systems, including Android, Symbian and Windows Mobile. It also has industry-leading con-



nectivity and broadcast solutions for Bluetooth, FM, GPS, Glonass, WLAN, Near Field Communication and USB.



ST-Ericsson's Zaventem site

The ST-Ericsson Zaventem site is shared with STMicroelectronics and about 70 ST-Ericsson design engineers work here. This design team has over 15 years of experience in Connectivity. It has developed and mastered a leading-edge, widely adopted Bluetooth solution and has managed the introduction of WLAN, GPS and FM IP to complete the platform solutions, with standalone and COMBO connectivity products.

DSP Valley helps us to link our company to a large and powerful ecosystem stretching across Belgium and the Netherlands, allowing collaborative research and leading to valuable partnerships. ■

DSP Valley goes medical: a hospital in the palm of your hand?

What if you could use your smartphone as your handheld doctor, lab or hospital?



Do I have malaria? Let's run a quick blood analysis on the phone using its built-in camera and a fitted microscopic lens...

Do I have a sexually transmitted disease? Let's plug a biochip in the phone and see the result instantly...

Does this mole on my arm entail a skin cancer risk? Let's take a picture with the phone and run a quick analysis on it...

Do I have a heart rhythm disorder? Let's run an ECG with the phone...

I can imagine that apart from the last example, these may all look like science-fiction to you. Still, they are a reality in today's amazing world of smartphone applications.

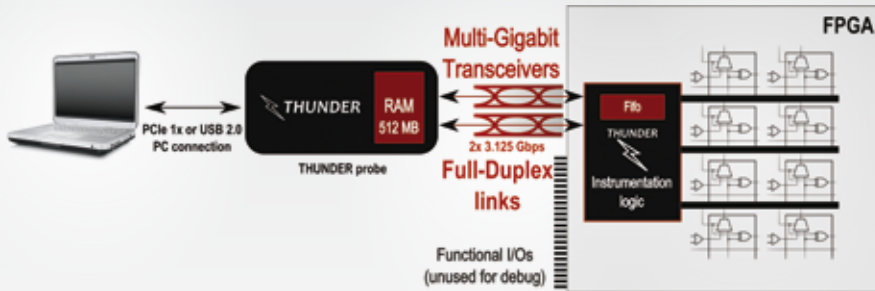
The Lifelens project does the malaria scan. The "instant" sexual disease test project is ongoing, with £4M funding. The SkinScan app is for sale for \$3,99; moreover, it maps the results of images taken worldwide on a world map to give

you a real-time idea of the distribution of skin cancer risks. And last but not least, a number of variations exist on the theme of heartbeat measuring with a smartphone: we had the imec-Holst-tass demo on an Android phone (working with separate wireless sensors); there's the Alivecor ECG with electrodes clipped directly on the phone (to hold against your chest, or press with two fingers); and there's the free InstantHeartRate app that uses the camera to "read" your heartbeat from colour variations in your fingertip...

continuation on page 6

Using Multi-Gigabit Transceivers to Test and Debug FPGAs

FPGA has become the platform of choice for complex digital systems. Full embedded systems that used to be implemented with a choice of separate digital ICs mounted on a board can now be implemented with a single FPGA chip.



Introducing Thunder Series probe

Byte Paradigm’s Thunder Series probe is an ‘embedded instrumentation solution’. It uses the available FPGA multi-gigabit transceivers as data channel to debug and test FPGA systems. It places the test / trace memory outside the FPGA. It includes an instrumentation IP implemented in the FPGA to:

- Reach the FPGA internal logic
- Extract FPGA internal data and send it to an external trace memory
- ‘Inject’ input stimulus for testing FPGA IPs and subsystems

It opens the way to a new approach for testing FPGAs, especially when testing partial designs or when using another kind of input source is too invasive.

In its first implementation, Thunder Series probe features two multi-gigabit links at 3.125 Gbps, implementing a 6.250 Gbps total bandwidth for test and debug data. Out of this bandwidth, useable throughput can be up to 5 Gbps full duplex. While this may seem very high, this bandwidth must be used wisely: this represents the continuous probing of 40 bits at 100 MHz, 20 bits at 200 MHz, 10 bits at 400 MHz, and so on.... With advanced triggering and filtering in the FPGA coupled with some buffering, bursts recorded from larger busses can be probed.

FPGAs contain lots of memory resources, support multiple I/O standards and have advanced communication interface building blocks such as Ethernet or PCIe PHY. Internal frequency can be as high as 500 MHz and above, in turning high-end FPGAs into very impressive pieces of hardware reaching unprecedented levels of computing and data processing power.

This poses new challenges for FPGA design, debug and test.

First, FPGAs need powerful connections able to ‘feed’ them at a very high throughput. This is a condition for efficiently using their computing power capable to process ‘a lot of data’ in real-time. For that reason, multi-gigabit transceivers able to transmit serial data at several Gbps have become very common FPGA features - even for entry-level FPGAs.

Second, FPGA design has evolved towards real ‘platform design’, similar to ‘System-on-Chip’ (SoC) design. This evolution of FPGA architectures aims at reaching shorter product time-to-market while handling higher system complexity. Designing FPGAs has become a matter of carefully choosing how to partition FPGA design between 3rd-party IPs (Intellect Property) and IPs designed in-house.

Debugging and testing each of these IPs is good practice before debugging and testing the whole system.

It is no wonder why **embedded instrumentation** has been increasingly successful. In a system implemented with a single FPGA chip, the points of test and debug can be IP boundaries. They must be accessed from inside the chip. Moreover, probing from physical board connections is becoming too intrusive.

Solution	Suitable when...	Advantages
Traditional Logic Analyzer	Chip I/Os are usable and accessible with a board connector	Saves on FPGA logic resources No FPGA memory required Potentially long trace length
Embedded Logic Analyzer	FPGA memory available Or Trace data quantities are limited	Saves on functional I/O Clocking at internal clock speed Easy to reach FPGA ‘internal nodes’
Thunder Series probe	Multi-gigabit transceiver(s) are available and accessible with a board connector	Saves on functional I/O Saves on FPGA memory Potentially long trace length Clocking at internal clock speed + Full-duplex links allow both analysis AND stimulus generation.

Verum's design contest inspires software engineers

It's not every day that software engineers get together to celebrate each others' creativity. However, at a special ASD User Event held on October 4, ASD:Suite users applauded the inspiration of several participants who presented their applications in Verum's design contest.



QR-Code for a free 30-day download

The apps ranged from process flow to machine control, and from automotive applications to interactive games. The evaluation process was very enjoyable -- especially when it came to the games. To share the excitement and creativity inspired by the contest with the Verum Community, Verum will be publishing descriptions of the apps in the coming months.



Verum iPad contest

Back in April, Verum challenged software engineers in Europe to enter an open competition. Contestants were given full access to the newest ASD:Suite and asked to build any application their heart desired. The impetus for the competition was to encourage developers to see for themselves how much more creative and agile software design could be within the ASD:Suite environment.

"As the contest drew to a close, it became very clear that there was a great deal of interest in using the ASD:Suite," commented Robert Howe, Verum CEO. *"Although we had expected the contest to demonstrate how the ASD:Suite can quickly translate inspiration into a flawless application, the submitted apps were much more diverse than even we had anticipated."*

About the ASD:Suite

Making software design verification a reality

The Verum ASD:Suite is a unique, general purpose, software design automation platform. Incorporating fully automated mathematical verification technology, it enables software engineers to build better, more complex software while delivering a net 30%-50% improvement in productivity and a corresponding decrease in time to market.

ASD:Suite users include Ericsson, FEI Company, PANalytical, Philips, Nspyre, Sioux, and TASS.

Sigasi promotes floating licensing for teams

Floating and user-locked licensing offered at the same unit price



automated hardware refactoring

Sigasi announces a simplified and more powerful licensing model. Customers can choose between user-locked or floating licensing at the same unit price.



Sigasi Pro is the most powerful VHDL IDE available. The unit price for a one-year Sigasi Pro license is \$850 for customers in the US and Canada and €599 for customers in other countries. This license includes online support and regular updates. Customers can choose to purchase user-locked licenses as before. Alternatively, teams that purchase more

than five licenses can opt for floating licenses at the same unit price. The license mechanism is based on the industry standard FlexNet, formerly known as FlexLM. This licensing scheme may reduce customers' administrative effort. Moreover, it allows any designer in the team to try out the fully functional product. Other services and products, including premium support, perpetual licensing, or custom product features, are available upon request.

AnSem announces the appointment of Dirk Logie as CEO

AnSem NV, a global leader in analog semiconductor design, announces the appointment of Dirk Logie as Chief Executive Officer. Mr. Logie will succeed Mr. Stefan Gogaert, who will continue to serve the company as its Chief Strategy Officer.



Mr. Logie, a former Philips Semiconductors' VP, is a senior executive with broad international experience in leading semiconductor businesses to growth and success. Mr. Logie was previously CEO of Chipidea Semiconductors in Leuven, prior to its acquisition by MIPS Technologies.

"We welcome Dirk into our AnSem family. With his proven track record, strong customer focus and extensive background in product marketing and strategy, development and operations management, Mr. Logie is the right executive to take AnSem to the next phase, where it will transform itself into a global analog and mixed-signal ASIC supplier" said Prof. em. Willy Sansen, chairman of the board



of AnSem NV. *"The board also wishes to express its gratitude to Mr. Stefan Gogaert for his leadership during the past 13 years, since the company's founding. The company is now firmly established as a respected analog design company that has been profitable since inception, largely due to the leadership of Mr. Gogaert. The company will further depend on his leadership to introduce AnSem in new*

emerging markets and into strategic business opportunities"

Mr. Logie will be based at the company's headquarters in Leuven, Belgium. ■

About AnSem

AnSem is a fabless IC design house founded in 1998. AnSem develops the most advanced customer defined analog and mixed-signal integrated circuits (IC) for RF CMOS wireless applications, high-speed data communication, data acquisition and ultra low-power & low-voltage applications. AnSem also provides turn-key IC solutions including testing and volume IC supply chain management services. AnSem's customers are leading OEM and semiconductor companies active in industrial, medical, wireless & wireline communications and aerospace markets. The design team has completed successfully more than 40 designs the last 13 years. AnSem is ISO 9001:2008 certified and is headquartered in Leuven, Belgium.

Septentrio has reinforced its team

Septentrio has reinforced its team appointing Wim Lahaye to Galileo bid & project manager in August this year. Wim Lahaye will prepare proposals and lead larger projects related to next generation products for Galileo and other upcoming satellite navigation constellations. These projects aim at further strengthening Septentrio's unique position in high accuracy – new constellation satellite navigation receivers.



Wim Lahaye is a Leuven citizen with a 20-year international career in the space sector. His main area of expertise is in satellite communication and satellite navigation ground systems and applications.

Wim Lahaye has been Managing Director at DKE Aerospace Luxembourg since April 2007. Earlier he was satcom systems engineer and product manager for satellite based asset tracking services at Spacechecker in Leuven and earth station engineer for SES Astra in Betzdorf, Luxembourg. He started his career as a system development engineer at Alcatel



Bell Space (now Antwerp Space). Wim Lahaye received the degrees of Master of Science in Electrical Engineering and in Industrial Management at the K.U. Leuven. He is also member of the Air & Space committee of the Royal Flemish Engineering Association K VIV. ■

Static Code Checking with MISRA-C 2004 Coding Guidelines

Driven by increasing complexity and rising demand for reliability and safety of embedded systems, a set of coding guidelines has been developed to aid the programmer in producing high quality source code. This set of guidelines, called MISRA-C 2004 has been compiled by industry specialists, gathered by MISRA, the Motor Industry Software Reliability Association. The research group, TERA-Labs at KdG has just finished the KriCode project (IWT TETRA), which has studied the MISRA-C 2004 guidelines and its applications.



In the last decade, the use of embedded systems (ES) has increased exponentially. More and more ES are used in safety-critical applications (e.g. automotive, medical equipment, automated industrial production, aerospace). To address this need for increased quality of ES source code, the MISRA organization has compiled a list of coding guidelines which limit the syntax and semantics of the C programming language or require documentation of implementation choices. For example:

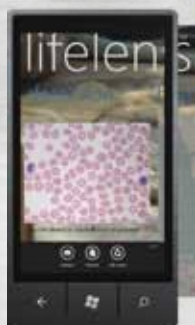
About TERA-Labs:

TERA-Labs is a research group at the IWT department of the Karel de Grote-Hogeschool (KdG). TERA is a shuffled acronym for Research Team on Embedded Applications. TERA-Labs joins the three existing research teams at the Electronics Engineering Department at KdG: Automotive ICT, Datacom Applications, and Ambient Technology. Starting out in automotive electronics and embedded software, the lab has extended its domain of interest to embedded applications in general. Currently, TERA-Labs takes part in a new IWT TETRA project, which starts the 1st of October. It deals with development of multicore embedded applications.

supported by IWT

continuation from page 2

Interesting as these developments may be, they also raise some challenging questions. How reliable are these apps? Are they just gadget versions of "serious" medical devices? Are they over-hyped by marketing (healthcare is hot!) long before they are really sellable? Are they on their way to rendering the "serious" devices obsolete, sometimes even before the latter get properly developed? Have they been "certified" by the proper authorities, by the way? And even if they were the "new thing" in medical device development, is there a sensible business model to make money with them? And while we're at the money question: are they refundable by health insurance companies or authorities?



Lifelens blood analysis on smartphone

There is no doubt that the smartphone will play (and is already playing) a major role as the aggregator and transmitter of personal medical-type information, but whether it can be a full-blown pocket hospital still remains to be seen..



Skinscan mole analysis on smartphone

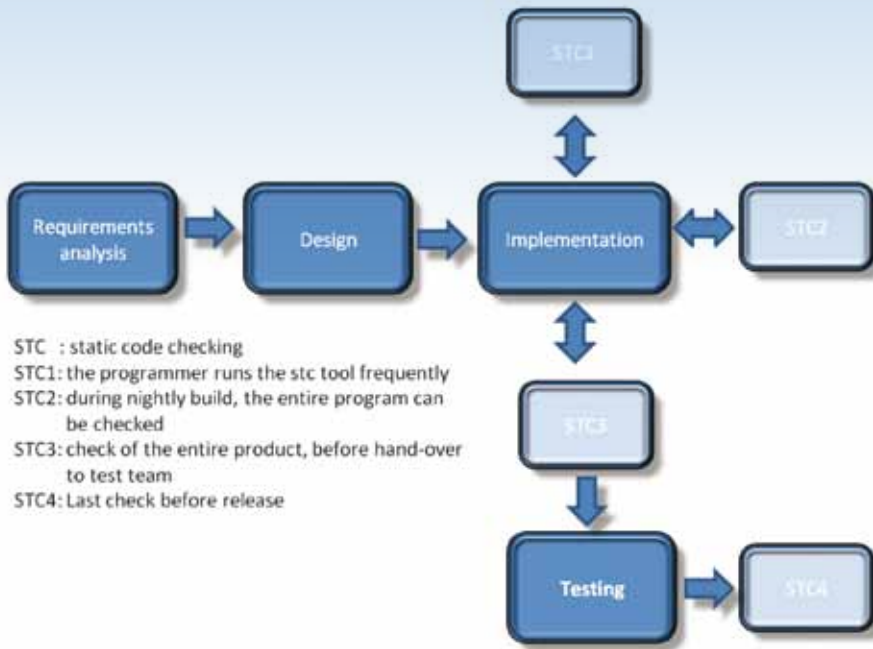
Now, you may wonder: what does DSP Valley have to do with all this? I am sure that our members Medtronic, Applied Biomedical Systems, Cochlear, Televic, imec, Philips, or NXP (to name just a few!) can definitely relate to these developments and issues, and that our other members and readers are also intrigued. Let's say I just wanted to arouse your interest in our new Special Interest Group on Medical Devices... It is a fascinating

world, and if you want to hear more about it, and explore new business opportunities, we invite you to have a look on our website at the upcoming activities of our newly created Special Interest Group on Medical Devices.

- www.thelifelensproject.com
- www.guardian.co.uk/uk/2010/nov/05/new-test-mobile-phones-diagnose-stds
- www.skinscanapp.com
- www.alivecor.com
- www.instantheartate.com

Geert Adriaens
Director Business Development





2004 rules in their software development process. Attention is paid to subjective characteristics such as usability and quality of the warning messages, and objective measures such as the number of false positives and false negatives.

During the project also course material was developed for a one-day hands-on workshop on the application of MISRA rules. This workshop contains a theoretical part which treats the MISRA rules and the relevant background of the C90 standard.

Also, after interviews with several companies, large and small, a report was produced on the embedded software development process and the place of static code checking in this process. ■

1. It is required to document the implementation of integer division in the chosen compiler.
 2. The comma operator shall not be used.
- For most of the MISRA-C 2004 rules compliance can be checked automat-

ically. Several software houses have developed products which contain this functionality. One of the main results of the KriCode project is a comparison of these tools, aimed at companies that wish to implement static code checking for MISRA-C

Kickoff Special Interest Group Medical Devices

October 27, 2011
NXP Semiconductors
Leuven



On Thursday, October 27th, DSP Valley kicks off its Special Interest Group on Medical Devices. The event will be held

at NXP, one of our large members with a major activity in Personal Healthcare. Goal is to stimulate business in Medical Device development for our members and relevant invited non-members active in the medical domain (technology suppliers, customers, care organizations, etc.). Speakers



www.dspvalley.com

from Belgium and the Netherlands will briefly highlight the market and business potential, and there will be ample opportunity for (pre-)organized contacts among the participants. Please note that for non-members, this event is accessible by invitation only, to keep attendance manageable.

DSP concepts explained with well-chosen exercises

November 14, 28, 2011
December 05, 19, 22, 2011
Imec Leuven, Belgium
Lecturer: Johan Schoukens (VUB)



Abstract

The course will be a basic theoretical introduction to the concepts of digital signal processing. The participants will discover the concepts themselves using well-chosen Matlab exercises. These exercises are fully documented: the theoretical framework, the problem to be solved, the solution

and a discussion, with notes for further reading and reference. The course is being used for 4 years at the doctoral school of the VUB (Free University of Brussels) and has proven excellent results. The participants go home with hands-on experience.

Program

- **Day 1: 14/11/2011**
Introduction to system theory and signal processing: impulse response and

transfer functions of linear systems, stability-causality; poles and zeros; sampling; DFF-FFT - all with Matlab exercises.

- **Day 2: 28/11/2011**
Introduction to measurement and modeling of linear systems (measurement of the frequency response function; choice of excitation; the effect of noise and leakage; estimation of the parametric model) - including Matlab exercises.
- **Day 3: 05/12/2011**

Handling non-linear distortion: detection; classification and qualification of linear distortion - including Matlab exercises.

- **Day 4: 19/12/2011**
Design of digital filters and systems (basic choices and non idealities: filter examples, compression and expansion, ...); including Matlab exercises.
- **Day 5: 22/12/2011**
Wrap-up: further Matlab exercises applying the techniques on integrated problems. Filter analysis of implemented filters, evaluating non-linear distortions (impact of quantizing noise).

Prerequisites

Basic experience with Matlab will be helpful.

Fees and regulations

The participation fee is 2500 EUR excl. 21% VAT.

Flemish academic staff and students can participate for free.

Flemish companies should contact the training office training@imec.be for special conditions.

More details

The course will take place at imec, Leuven.

Imec is the largest independent micro-electronics R&D center in Europe, with an annual budget of over 300 million Euro and a staff of over 1800 people. R&D ranges from design of complex single-chip and single package systems for telecommunications and multimedia, over new process technologies (18nm node) to non-volatile memories, optoelectronics, photo-voltaics, area-array packaging, etc.

Register by sending an email to training@imec.be

Seminar: Testing of Embedded Systems



www.verifysoft.com/rotterdam.html

13 and 14 February 2012,
Bilderberg Hotel, Rotterdam,
The Netherlands

This seminar with Professor Dr. Fischer (Hochschule Offenburg, Germany) provides the essential skills to test efficiently and effectively high-quality value and reliable Embedded Software. In addition to test management, this workshop provides technical and procedural practices. Through

concrete exercises and examples participants will be able to enhance their own projects.

Highlights:

- Development Process and Organization
- Test Techniques (Basic Test Techniques and important test techniques for Embedded Systems, Control flow and data flow oriented testing, checklists,

MISRA rules, ...)

- Test Environment and Software Tools (Test frameworks and test automation, Design for test, Dynamic and Static code analysis, ...)

- Important trends (model based testing, ALM, Software maps, ...)

This seminar is suitable for developers, test engineers and test managers, managers.

Contact Information

ST-Ericsson – supplying wireless platforms and semiconductors to the world's leading device makers • p.1

Mr. Steve Beckers, Marketing Director ESC Division, ST-Ericsson • Tel. +32 2 718 18 32 • Fax +32 2 718 19 69
www.stericsson.com • steve.beckers@stericsson.com

DSP Valley goes medical: a hospital in the palm of your hand? • p.2

Mr. Geert Adriaens, Director Business Development • Tel. +32 16 24 14 43 • Fax +32 16 24 14 49
www.dspvalley.com • geert.adriaens@dspvalley.com

Using Multi-Gigabit Transceivers to Test and Debug FPGA • p.3

Mr. Frédéric Leens, Sales & Marketing Manager Byte Paradigm • Tel. +32 67 34 28 94 • Fax +32 67 34 28 95
www.byteparadigm.com • frederic.leens@byteparadigm.com

Verum's design contest inspires software engineers • p.4

Mrs. Stephanie Bakker • Tel. +31 40 235 90 90 • www.verum.com • communications@verum.com

Sigasi promotes floating licensing for teams • p.4

Mr. Philippe Faes, CEO Sigasi • Mobile +32 494 87 22 72 • www.sigasi.com • philippe.faes@sigasi.com

AnSem announces the appointment of Dirk Logie as CEO • p.5

Mr. Dirk Logie, CEO AnSem • Tel. +32 16 38 65 00 • www.ansem.com • business@ansem.com

Septentrio has reinforced its team • p.5

Mr. Wim Lahaye, Galileo bid & project manager Septentrio • Tel. +32 16 300 833
www.septentrio.com • wim.lahaye@septentrio.com

Static Code Checking with MISRA-C 2004 Coding Guidelines • p.6

Dr. Hugo Van Hove, dep. IWT, Karel de Grote-Hogeschool • Tel. +32 3 613 17 79
www.teralabs.org • hugo.vanhove@kdg.be



This publication has been realized with the support of IWT and the European Union (EFRO).