Chip Chat

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Field Programmable Technologies Conference

6th – 8th December 2004, University of Queensland

The University of Queensland will host the 3rd International Conference on Field-Programmable Technologies (FPT) in December.

Field-programmable technologies combine the flexibility of software with the performance of hardware, and have become an important topic of research for universities, government and industry worldwide. With over 80 peer-reviewed technical papers, FPT 2004 brings together cutting edge research on applications, design techniques, architectures and silicon technologies for field-programmable devices and systems.
For more information visit the conference website http://icfpt04.itee.uq.edu.au, or email fpt@icfpt.org.

CSIRO ICT Spin Off – Welcome EpiTactix

After 12 years at CSIRO, last week Shaun Cunningham emerged with his own company, $5 million in capital and the dream of creating an Australian semiconductor industry.

As chief technical officer, founder and acting CEO of EpiTactix, Cunningham is targeting what he describes as a stagnant market niche worth $US10 billion ($A14.2 billion) a year – the compound semiconductor market – with two ideas he says could revolutionise the industry. First, there is a new way to manufacture compound semiconductors, and secondly, a new class of transistor that will deliver higher performance at a lower price.

Cunningham aims to develop gallium-arsenide compound chips, which he describes as the "Ferrari of the microchip world". They operate at speeds between 10 GHZ and 100 GHz and are used for high-performance applications. These chips "run very, very fast but are also very expensive," Cunningham says. EpiTactix plans to develop products for defence and automotive radar, high bandwidth point-to-point systems and a number of high bandwidth consumer applications.

EpiTactix is the first spin-off business to come out of the CSIRO's ICT centre, the new organisation that amalgamates previously dispersed CSIRO information technology research and commercialisation activity particularly in wireless systems, autonomous systems and robotics, information content management and high-performance networking. The Centre's new director, Alex Zelinski, says enterprise creation is the aim of the organisation, which is seeking opportunities to collaborate with other public and private sector organisations. So, hopefully, EpiTactix will be the first of many spin-outs from the new centre.

Xilinx Embedded System Development Course

Instead of going to San Jose or Hong Kong you can now do advanced FPGA courses in Melbourne thanks to the work of Terry McNiff from Dingo Electronics, the Xilinx Approved Training Provider for Australia and New Zealand.

Terry has been providing the mid level training for years and now, with his new "Hot Between Jobs" idea he's hoping to utilize experts in microelectronics design who have some time between design projects to provide some of the higher level FPGA training in Australia. The first of these is the Xilinx Embedded Systems Development Course with Dragan Stancic.

Dragan is best known to the Australian engineering community as Senior EDA Consultant with Mentor Technologies. His valuable experience includes trouble shooting design engineers' FPGA and ASIC projects using a wide range of design and simulation tools.

Dragan's special mix of project management experience, tools use and support to engineers seeking solutions to real life design problems places him in a unique position to give participants a flying start in Xilinx Embedded System Design.

During the course you'll experience the Xilinx MicroBlaze™ 32-bit soft processor core, the hard embedded IBM PowerPC (64-bit) core in the Virtex-II Pro FPGA, and the Embedded Development Kit (EDK) design environment. You'll be using Xilinx ISE 6.2, Mentor Graphics ModelSim & Xilinx EDK 6.2.

"Hands on" labs are plentiful and provide personal experience with the development, debugging, and simulation of the embedded system.

This is an advanced course, you will need to have completed the Fundamentals of FPGA Design course, or have equivalent experience of Xilinx ISE implementation tools. Basic understanding of C programming, basic microprocessor experience, understanding of PowerPC and MicroBlaze systems is also required.

Venue:	Network Communication Industries Pty Ltd 350 Collins St, Melbourne VIC
Dates:	16th & 17th November 2004
Cost:	$1600 (+GST)
Contact:	Terry McNiff Training Manager Dingo Electronics 0407 346 463 or +61 3 9431 6874

email: information@dingo-electronics.com.au

Please note that the class size is limited to twelve participants so please get in quickly to reserve your spot. Confirmation is issued on receipt of a 25% deposit.

If you would like to get information on the other courses being held by Dingo Electronics please go to the website: http://www.dingo-electronics.com.au/

If you're a FPGA expert and are currently between projects and would like to be considered as a Training Leader for "Hot Between Jobs", please contact Terry McNiff directly.

Handheld Bluetooth RFID reader is unprecedented

Radio frequency identification (RFID) enabler and service provider Cathexis Innovations has joined with Baracoda, to develop the beta version of the first handheld Bluetooth 13.56 MHz RFID reader, dubbed IDBlue.

Unlike typical RFID handheld readers, this "pen-type" design is revolutionary because of its size (small and light weight) and ease of use, flexibility (compatible with PDAs, PCs, etc). Bulky and cumbersome RFID readers can be replaced with a lightweight and ergonomic solution that can easily be carried in your pocket and also double as a stylus.

It is suitable for applications requiring pinpoint accuracy reading--a feature that is currently not possible with most RFID on the market today. In addition, the IDBlue Bluetooth reader is one of the first to harness the power of RFID. IDBlue is gaining particular attention in the health care, military and retail sectors for applications as diverse as inventory management, supply chain, maintenance management and document tracking.

Analog Grows Fast in Europe

Europe is one of the fastest growing markets for analog semiconductor products despite the movement of so much high volume manufacturing to Asia.

According to Larry Spaziani, European director of high performance analog and power products at Texas Instruments, Europe accounts for around 22 percent of the total available market (TAM) for analog products. The market has been boosted by the production of industrial and telecoms products in Eastern European countries such as the Czech Republic.

There was around $6 billion worth of product shipped in Europe last year and this is expected to rise to $10 billion by 2009. "But remember that in units sold, the design activity in Europe will be proportionally higher," said Spaziani. "As the TAM moves to Asia does not necessarily mean the design will follow," he added.

Data converters represent one of the fastest growing analog product groups. The industrial motor control market alone is growing at almost 10 percent a year. "Data converter sales are growing faster in Europe than other regions of the world," said Spaziani. He expects sales of data converters in Europe to triple over the next five years.

Sales of high performance op amps are expected to see similar sales growth driven by their use in medical systems, automotive, comms and video applications.

CEA LETI and Thales Join for RF MEMS Lab

Frances' Thales Group and its atomic energy commission CEA have formed a new joint laboratory to work on RF MEMS.

The two parties officially signed the joint venture yesterday in Grenoble, France, where one of CEA's principle R&D labs, LETI, is located. The new laboratory brings together a CEA LETI team and a team from the Thales research center at Orsay, France.

The RF MEMS lab will be based in Grenoble at CEA LETI's Heterogeneous Silicon Integration department and will have access to its dedicated microsystems development platform. The laboratory plans to design and develop high-power microwave microswitches and ICs based on these microswitches, the researchers said. According to the company, Thales plans to utilize the microsystems developed in the new laboratory in applications including future radar and radio systems for defence, security and aerospace markets, as well as making them available to other users.

Moore No More?

Bill Schweber, Executive Editor -- EDN,

Since scientist Gordon Moore's seminal and fairly accurate conjecture in 1965, our industry has lived and prospered by his eponymous "law". From the earliest ICs to today's mega-ICs, it's been a long road of problems and advances in all aspects of technology and tools, as our industry developed an enveloping supply chain encompassing silicon, optics, physics, metrology, software, and more. We have faced and overcome innumerable, substantial unknowns and technical challenges.

But, as we approach the next milestone of the road map—90 nm—some industry experts are starting to worry, and these people know more about solid-state physics and processes than I do. They are concerned either that we won't be able to attain the next steps or that the realizable gains won't outweigh the technical and cost pains. For example, Bernard Meyerson, PhD, chief technologist at IBM, says that classical scaling is dead and

that feature shrinkage no longer offers benefits that outweigh its problems. Meanwhile, John East, president and chief executive officer of Actel, argues that 130 nm will be the last great process reduction and that the 90-nm step will be impractical due to financial problems and technical limits.

I have mixed feelings about their comments. On the one hand, we've all heard over the past decades many dire warnings about the impossibility or difficulties of these next leaps with respect to basic materials, production equipment, design tools, or test capability, yet our industry has overcome each obstacle and moved ahead. On the other hand, we know that things can't go on forever; at some point, every technique or process reaches a fundamental limit at which radically new, disruptive approaches take over.

Plastic transistors, printed using an ink-jet-like method, may become feasible on a large scale for producing LCDs with fairly low density. Perhaps some biologically based technology that researchers are now studying in a lab will replace our solid-state world, as difficult as that is for us to believe.

Another force is making me wonder whether we are reaching the end of a long road. Our industry has always been cyclical, with swings between boom and bust, and these swings seem to be getting larger. When business is good, it's very good; fabs run at full capacity. When business is bad, fab usage drops significantly, and a lot of expensive capacity sits idle.

Yet, as engineers, you know that it is usually better to have a closer coupling between a system's inputs and capacity, or line and load, along with smoother changes to each, as a condition for overall stability and more efficient operation. As the swings get wider, the absolute difference between demand and capacity gets bigger, because there is always a lag time between those two factors. This situation occurs whether demand ramps more quickly than capacity or manufacturers build capacity in anticipation of future demand.

Perhaps we are reaching the point at which the matched forces of our solid-state-technological progress and the laws of physics are no longer in close enough balance to make things work out as they have in the past. If that's the case, then the next few years are going to be exciting, surprising, and a learning experience for all of us.

DARPA Contracts Lucent for Maskless Litho

Lucent Technologies was recently selected by the Defense Advanced Research Projects Agency (DARPA) to develop an advanced microsystem to enable faster, more economical and more secure design, engineering and fabrication of next-generation advanced silicon chips for military applications such as transformational communications and homeland security.

The four-year, $9.5 million contract was awarded by the Space and Naval Warfare Systems Center San Diego, which calls for Lucent to design, develop and demonstrate micro electro mechanical systems (MEMS)-based Spatial Light Modulators (SLM) to enable maskless optical lithography. Companies working on the project with Lucent include Corning Tropel, DuPont Photo Masks and Lincoln Laboratories, along with close partnership with ASML.

Maskless lithography process using MEMS-based SLMs promises to facilitate the manufacture of circuits without the expense of individual masks and Lucent said its SLMs enable such circuits to achieve smaller critical dimensions with higher throughput.

The MEMS SLM technology was developed at Bell Labs and is possible by advanced nanofabrication, which contain 10 times more individual movable micromirrors, or pixels, than currently available, Lucent said. Individual pixels will be five times smaller and 10 times faster so that optical maskless lithography systems could be used in the fabrication of next-generation microelectronics can have features as small as 50nm and high throughput.

A MEMS SLM approach makes it possible to manipulate light in ways not previously possible. Lucent's MEMS SLMs contain 100 to 200 nanometer features, with extremely small mirrors packed in an integrated multi-megapixel array to reduces the need for projection optics required for small, 50nm, critical dimensions of next-gen ICs. The lower demagnification required for the smaller mirrors allows for a larger image area with the same optical element sizes and projector numerical aperture to enable throughput that 10 to 50 times faster than other current maskless lithography processes, resulting in efficient and cost-effective fabrication.

"One of the most critical barriers in the areas of maskless lithography is the development and implementation of the appropriate beam modulation technology," said Dave Bishop, VP of nanotechnology research and president of the N.J. Nanotech Consortium at Bell Labs, in a statement. "The micromirror technology Lucent is providing to DARPA is a giant leap forward in the area of advanced MEMS designed and engineering, and is being achieved by combining innovative design with our unique MEMS fabrication capability. We foresee this technology having positive impact on such critical areas as homeland security and military transformational communications."

These babies are great for Wi-Fi reception