Embedded Edge On-line: A Rich Source of Design Information

This may be the debut issue of *Embedded Edge* on-line but its contents are as advanced as it gets in the DSP world. To begin with, check out the cover story. As the Prodys authors explain, the emergence of the new MPEG-4 standard has burst open the door to real-time applications running on digital signal processors. Video and imaging, broadcasting, streaming media, teleshopping, interactive TV, Internet gaming, video surveillance, video messaging, mobile video communications, other applications that work at the blink of an eye—you name it.

No special processor is needed; speedy available ones, such as the TMS320C6000™ platform, will do and no hardware acceleration is required. Even better, MPEG-4 encoders implemented in DSP chips are software-only, meaning that designers can enjoy great flexibility in adding, modifying or upgrading functions. And as the speed of DSP chips continues to soar, as it surely will, even faster applications open up. Visual encoders are a distinct possibility here.

In the lead story, the authors unravel the details of the MPEG-4 standard and show how to implement various encoders, from simple to advanced, to get the best performance.

In our second article, "Designing Multi-Standard Communication Devices," authors Andrea Kroll and Johannes Stahl of Synopsys explain how an SOC, such as OMAP, satisfies the stringent cost and technical requirements of modern consumer devices—many of which are characterized by advanced communications features.

But such communication-based products cannot be designed without working at the system level and without using the right modeling and simulation tools. Only in that way, say the authors, can you satisfy your algorithmic and architectural requirements and also achieve the flexibility of modeling and simulation speed needed for fast design iterations.

Designing such a system sequentially, that is, producing chips and boards first, then writing application software—and experimenting in the lab—no longer is an option, warn the Synopsys writers: "No one can afford to risk an extra $500,000, perhaps more, for a chip respin to kill bugs."

The Prodys and Synopsys articles outline powerful advances in DSP application, to be sure. But "with great power comes great responsibility," says the author of our next article, quoting from a character in the blockbuster movie, Spiderman. In this case, however, the "power" applies to OMAP the dual-processor chip from TI, and the theme of the article covers application programming strategies for the OMAP.

As the author, Natalie Kloss from Stellcom, says, the challenge in exploiting the power of two processors on one chipóone a general-purpose device; the other, a DSP device—is how to design effective software for the chip. The task can be particularly challenging if the software in question is being ported from a system that already works on a traditional single-processor architecture. The question is: How can such software be adapted to effectively use the OMAP?

The Stellcom article explores the answer to that question and offers suggestions as to how either new applications can be created or existing code can be adapted to take advantage of the OMAP resources.

Speaking of algorithms and simulation, how would you like to save months in your quest to move algorithms to new targets? The way to do it, says Peter Darnell of Visual Solutions, is to go to a visual programming language. The process becomes easier, too, Darnell adds. Add simulation to the mix, and you can eliminate problems and tune design parameters early in the design phase. To show how, our last article in this issue's lineup offers a specific DSP embedded control problem that illustrates the development cycle involved in using such a tool.

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