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The big value-add is now on the software side

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As television radically shaped the 20th century, innovation in displays most often depended on improvements in hardware. That may not be the case in the future.

Increasingly, advances in electronics systems, even consumer stuff — the very displays we count on for most of our visual entertainment — will come to be driven by improvements in software.

Two research projects described at last week's Siggraph conference exemplify this shift to commodity hardware, leaving the big value-add to software.

Ramesh Raskar, a researcher at Mitsubishi Electric Research Laboratories, is carrying around a prototype Digital Light Processing Pocket Projector that uses an LED light source to enable on-the-fly viewing of movies, digital camera pictures or video — even games from almost anywhere. The projector fits easily into someone's pocket. It also offers instant on-and-off, and quick play, for true consumer convenience and flexibility. Raskar has high aspirations: to instrument the physical world so that objects become self-describing, communicating their identity, geometry and such information as history or user annotation. All that is software stuff.

Meanwhile, Andy Wilson, a researcher at Microsoft Research, is rendering incarnate the Hollywood notion of gesture- and direct-manipulation-based interfaces involving transparent displays. Using an off-the-shelf projector with three cameras and digital processing techniques, Wilson combines the output of the video cameras placed behind a semitransparent plane in front of a person. A touchscreen display is projected under typical indoor-lighting conditions, transforming the ordinary sheet of acrylic plastic into a high-bandwidth input/output surface suitable for gesture-based interaction (see story, page 6). The TouchLight project recalls such movies as Minority Report and The Matrix Reloaded, which depicted manipulation-based interfaces involving transparent displays.

Both projects have one thing in common. Mitsubishi's tiny projector is the result of constant integration of commodity chips — TI's Digital Light Processing ICs — and Microsoft's TouchLight uses commercial off-the-shelf parts to do its job. In both cases, hardware has become a commodity and all the value-add is in the image-processing software.

Indeed, at Siggraph the exhibits on the floor, like the technical papers, were all about software developments. That may have always been the staple of a conference like Siggraph, given its emphasis on animation and special-effects graphics, but at the height of the workstation wars there was at least a semblance of competition to see whose hardware box was faster. Even Star Wars director George Lucas in his keynote said that he has given up on hard storyboards to set his next script to a moving image. Today, he constantly fine-tunes his scenes with previsualization software.

Designers should become attuned to their "soft" side, before the hardware coming from outsourced venues forces them to make that move.

-Nicolas Mokhoff (nmokhoff@cmp.com), editor of special features for EE Times

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