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Reconfigurable opto devices are on the way

Harry Yeates

The scientist leading research into optical computing and interconnects at Heriot-Watt University expects to see reconfigurable optical components inside commercial devices "within the next few years".

Dr John Snowdon says such devices have been attempted by various groups, but none have had access to the core reconfigurable technology. He says the Heriot-Watt team has been able to progress partly thanks to a tie-up with FPGA firm Xilinx.

"What we're trying to develop is almost like a generic optoelectronic computing component," he said. "An optoelectronic chip that's reconfigurable, which has something like 10,000 optical pins attached surface normal to it, so you can really load up the reconfiguration patterns, you can reload the data, all kinds of things."

The ten-strong group is funded by the EPSRC (£500k) and the EU (£500k) through a number of related projects. It has industrial partnerships with Thales and Siemens for its HOLMS (high-speed optoelectronic memory systems) project.

"For the last ten years we've been talking about putting optics into computing," explained Snowdon. "Recently the components have matured, and we're able now, without doing a big experiment, to actually put together board-to-board and chip-to-chip optical interconnects."

Snowdon said the mismatch between processor and memory bandwidths needs to be addressed by the industry, and thinks his optical interconnects could solve the problem. He has already had enquiries from third-parties about using the technology, but isn't yet able to oblige. "I have to say to them 'you'll have to hang on'. We've got confidentially agreements, IPR issues," he said.

The relationship with Xilinx was strengthened recently when the Edinburgh University collaborator Professor Gordon Brebner left to join the firm. The company provides hardware for the group, and benefits from the optical know-how developed.

"Xilinx are feeling the pinch at the moment in terms of reconfigurable architectures - they want an extra string to their bow and they see that optics could well provide that, said Snowdon."

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