
Electrical & Computer Engineering
S E M I N A R
Louisiana State University

**Reconfigurable Meshes with Optically
Pipelined Buses and Fault-Tolerant Algorithms**

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Abstract—Recently, many models using reconfigurable optically pipelined buses have been proposed in the literature. A system with an optically pipelined bus uses optical waveguides, with unidirectional propagation and predictable delays, instead of electrical buses to transfer information among processors. These two properties enable synchronized concurrent access to an optical bus in a pipelined fashion. Combined with the abilities of the bus structure to broadcast and multicast, this architecture suits many communication-intensive applications.

The number of processors involved in the systems considered raises the probability of a fault occurring to significant levels. Researchers have proposed fault tolerant algorithms for many parallel architectures. They have not, however, addressed the issue of fault tolerance for reconfigurable models, and more specifically, for any of the optically pipelined models.

In this seminar a basic understanding of the structure and addressing methods of optically pipelined models will be provided. Fundamental algorithms for one specific optical model, the *Linear Array with a Reconfigurable Pipelined Bus System (LARPBS)* will be presented. Furthermore, some basic algorithms, such as binary prefix sums, compression, sorting, and permutation routing, that are able to tolerate up to $N/2$ faults on an N -processor LARPBS will be covered. These results will be extended to algorithms in the areas of image analysis and matrix operations.

When: Thursday, 10 February 2000, 13:30 - 14:30

Where: Room 117 EE Building

Info: <http://www.ee.lsu.edu/seminar>