Optical Routing and Transport Accelerator (ORTA) (Yissum)

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Fast electronic/optical interconnectivity for processing digital data

Categories	Optoelectronics / Photonics, Optoelectronic Computing & Optical Communication
Development Stage	Concept
Patent Status	PCT patent filed
Market Size	The 2003 worldwide market for semiconductor optoelectronic components was estimated at $9 billion, forecast to grow by an annual average growth rate of 20% to over $22.3 billion by 2008

Highlights

- There is a growing demand to process larger volumes of digital data at ever increasing speeds plus exponential growth in performance of the basic microelectronic components
- Current interconnection network, comprising multilayered complex of parallel electrical conduits, is a major bottle neck
- Optical communication links provide effective, fast transport for large volumes of digital data over long distances in telecommunication
- Problem: electronic data is in the form of digital, parallel-electronic words while optical data is organized as a serial string of photonic bits or digital, serial-optic words – need method for cost-effective conversion.

Our Innovation

ORTA is a generic architecture for converting between digital, parallel-electronic words and digital, serial-optic words incorporating two processes:

- Conversion between parallel and serial signals by complex multiplexing or de-multiplexing; and
- Conversion between the electronic and the optic representations of the signals using fast electronic devices and optoelectronic modulators.

Key Features

- Generic architecture optimized for conversion of digital data back and forth from electrical pulses to photonic pulses
- Effective for data conversion from electronic circuit to optical fiber and vice versa
- ORTA operates at the rate of the data processing of the electronic processors without the need for ultrafast optoelectronic transmitters and receivers

Development Milestones

- Preliminary design of a specific embodiment of the ORTA concept using simulation tools.

- 12-18 months $250,000.
- Complete implantation of ORTA preliminary prototype including layout design and fabrication in a foundary. 18-24 months approximately $2,000,000

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