

Low Power Photonic Computer Networks

Providing increased information technology performance with lower energy

The provision of future services in the digital economy is reliant on achieving more power efficient computers. Silicon photonics potentially enables the integration of photonic network elements on the processor chip, enabling reduced energy per bit for off-chip and on-chip communications. Dr Philip Watts is investigating the performance and power consumption of integrated photonic networks for future large scale computer systems such as data centres and high performance scientific computing.

His research seeks to find photonic network configurations which provide low latency for the short packets used in computer networks while reducing both total power and, in particular, power dissipated on the processor chip. In addition, Philip is demonstrating power optimised physical and data link layer protocols for photonic interconnects scaling to several Tb/s.

Other technologies that Dr Watts is currently working on include:

Digital signal processing for optical communications including generation of advanced modulation formats such as orthogonal frequency division multiplexing (OFDM).

Dr Watts' areas of expertise include:

- Optical communications
- Digital design for ASIC and FPGA
- Computer networks
- Physical and data link layer circuits



Dr Philip Watts,
Optical Networks
Group

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Applicable to:

- Data Communications
- Data Centres
- High Performance Computing
- Telecommunications

Partner Companies:

- Xilinx



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