

中国科学院微电子研究所
& 英国剑桥大学
学术交流

Haining Yang
Centre for Photonic Devices and Sensors,
University of Cambridge, U.K.
ROADMap Systems Ltd, U.K.

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报告人介绍:

- Dr. Haining Yang received his PhD degree in Engineering from University of Cambridge.
- He is a Research Associate in University of Cambridge and Principal Engineer in ROADMap Systems Ltd.

Title: Holographic Wavelength Selective Switching Platform

Abstract: In the past three decades, the volume of global data traffic has been growing at an astonishing rate with little sign to slow down. In responding to this need, the backbone of the network for long distance voice and data communication has evolved from all electrical based on copper wires or radio, mixed optical and electrical with optical fibers in data transportation and electronics in switches and end-nodes, and now to all optical in which information is kept in the optical domain through the network until it reaches its final destination.

In order to make use of the vast bandwidth available, concurrency among multiple user transmissions is necessary, and the wavelength division multiplexing (WDM) is the main technique in use. A wavelength selective switch (WSS) is able to selectively route individual WDM channels of any formats entering its input fibre port to any of the output fibre ports according to the software configuration controlled by the service providers. Phase-only liquid crystal on silicon (LCOS) spatial light modulator (SLM) has become the most flexible engine for WSSs, one of the key enabling technologies for reconfigurable all optical networks.

We will review the advantages of LCOS WSSs and the use of holographic wavefront modulation for advanced switching functionalities and delivery of the key performance matrix. We will then introduce a new stacked WSS architecture based on 2D beam steering, where multiple independent WSSs can be integrated on a single LCOS device with common optics. This approach can significantly reduce the cost and footprint and allow the WSSs to be reconfigured as ultra-high port count switches or non-blocking wavelength cross-connects (WXC)s. Finally, we will address how this stacked WSS architecture can be used to meet the optical switching demand in large-scale data centres.