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Photonic Interconnects for Computing Systems

Understanding and Pushing Design Challenges

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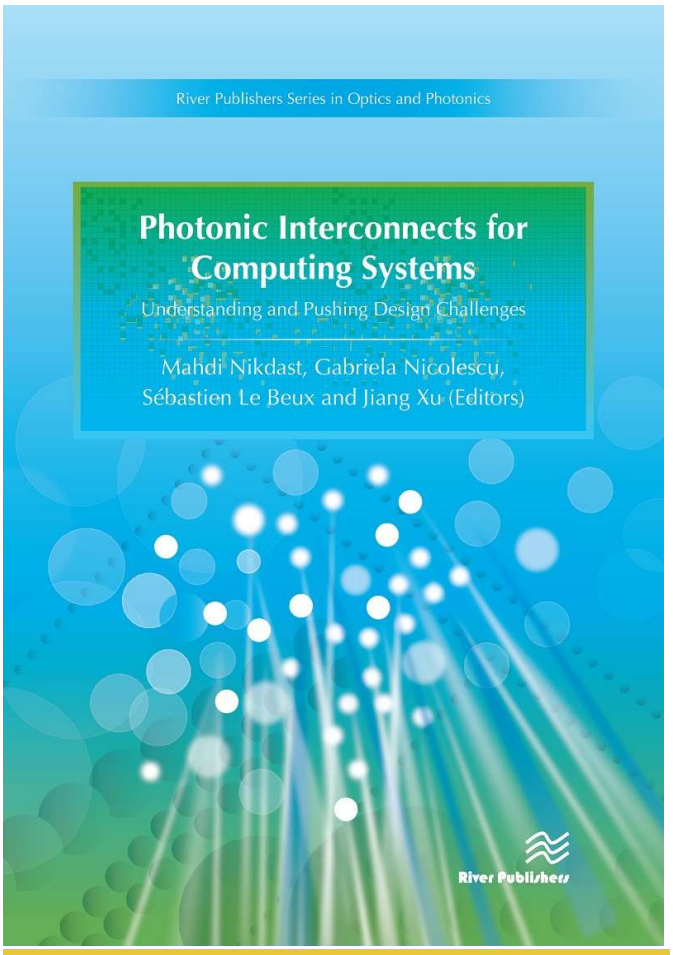
In recent years, there has been a considerable amount of effort, both in industry and academia, focusing on the design, implementation, performance analysis, evaluation and prediction of silicon photonic interconnects for inter- and intra-chip communication, paving the way for the design and dimensioning of the next and future generation of high-performance computing systems. *Photonic Interconnects for Computing Systems* provides a comprehensive overview of the current state-of-the-art technology and research achievements in employing silicon photonics for interconnection networks and high-performance computing, summarizing main opportunities and some challenges. The majority of the chapters were collected from presentations made at the International Workshop on Optical/Photonic Interconnects for Computing Systems (OPTICS) held over the past two years. The workshop invites internationally recognized speakers on the range of topics relevant to silicon photonics and computing systems.

Technical topics discussed in the book include:

- Design and Implementation of Chip-Scale Photonic Interconnects;
- Developing Design Automation Solutions for Chip-Scale Photonic Interconnects;
- Design Space Exploration in Chip-Scale Photonic Interconnects;
- Thermal Analysis and Modeling in Photonic Interconnects;
- Design for Reliability;
- Fabrication Non-Uniformity in Photonic Interconnects;

Photonic Interconnects for Computing Systems presents a compilation of outstanding contributions from leading research groups in the field. It presents a comprehensive overview of the design, advantages, challenges, and requirements of photonic interconnects for computing systems. The selected contributions present important discussions and approaches related to the design and development of novel photonic interconnect architectures, as well as various design solutions to improve the performance of such systems while considering different challenges. The book is ideal for personnel in computer/photonic industries as well as academic staff and master/graduate students in computer science and engineering, electronic engineering, electrical engineering and photonics.



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