Special Issue

Recent Advances in Silicon Photonic Sensors

Message from the Guest Editors

Silicon photonic sensors have emerged as a transformative enabling technology in the era of miniaturized, high-performance sensing systems, leveraging compatibility with mature CMOS manufacturing processes, exceptional sensitivity, low power consumption, and inherent integration capabilities. In optical communication, they are integrated with data transmission modules to enable real-time link monitoring and wavelength stabilization; in biomedical engineering, they facilitate label-free molecular detection, single-cell analysis, and wearable health monitoring; in environmental and industrial sectors, they support trace gas analysis, precision temperature/pressure measurement; and in autonomous systems, they serve as core components of solid-state LiDAR for obstacle recognition and environmental perception. Besides, silicon photonic measurements are known to be degraded by inherent challenges, such as on-chip insertion loss, thermal drift and cross-sensitivity to external vibrations. This Special Issue aims to gather novel developments in the field of silicon photonic sensors, encompassing both groundbreaking methodological advances and pioneering results in real-world applications.

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Message from the Editor-in-Chief

Sensors is a leading journal devoted to fast publication of the latest achievements of technological developments and scientific research in the huge area of physical, chemical and biochemical sensors, including remote sensing and sensor networks. Both experimental and theoretical papers are published, including all aspects of sensor design, technology, proof of concept and application. Sensors organizes Special Issues devoted to specific sensing areas and applications each year.

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