Special Issue

Emerging Trends in Optical Neural Networks

Message from the Guest Editors

In this era of technological evolution, optical neural networks are experiencing significant growth, primarily driven by the growing demands of artificial intelligence and neuromorphic computing. The inherent limitations of digital electronic hardware, characterized by its central processor and separated memory, beckon a shift towards non-von Neumann computing architectures. These architectures promise massively distributed, parallel processing capabilities, paving the way for applications demanding low latency, high bandwidth, and energy efficiency. Optical neural networks leverage the speed, bandwidth, and parallel processing capabilities of light to accelerate computational tasks, particularly those inherent to deep learning and artificial intelligence applications. This Special Issue aims to showcase the latest research, breakthroughs, and innovations in the field of optical neural networks. Topics include, but are not limited to, the following:

- Multiwavelength neural networks;
- Coherent networks;
- Spiking neural networks;
- Free-space neural networks;
- Nonlinear activation functions;
- Hardware algorithms;
- Applications.

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Deadline for manuscript submissions

closed (15 June 2025)

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mdpi.com/si/200913

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Message from the Editor-in-Chief

You are invited to contribute a research article or a comprehensive review for consideration and publication in *Photonics* (ISSN 2304-6732). *Photonics* is an online open access journal covering both the fundamental and applications of optics and photonics. *Photonics* strives to provide an avenue to allow authors to disseminate their scientific findings—both theoretical/ simulations and experimental works—in highly accessible peer-reviewed journal publications. The manuscript in *Photonics* will be handled with quick turnaround production processing time. We welcome authors to submit their manuscripts for publications in *Photonics*. Our goal in *Photonics* is to enable fast dissemination of high impact works to the scientific community.

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