Special Issue

Machine Learning and AI for Security in Optical Communication Systems

Message from the Guest Editors

The exponential advancement of artificial intelligence (AI) and machine learning (ML) is transforming communication systems and networks, creating opportunities for innovation, efficiency, and improved security. This issue explores the role of AI and ML in strengthening security in optical communication networks, focusing on physical layer security (PLS), authentication, identification, monitoring, and responses to emerging attacks. It emphasizes advances from information theory to practical implementation, addressing trustworthiness, integrity, and resilience at the physical layer. Topics include AI/ML-driven authentication, identification, monitoring, and attack detection, as well as strategies to ensure privacy in optical telecommunications and critical infrastructure networks. We encourage authors to submit high-quality, original contributions proposing robust and efficient security mechanisms capable of protecting optical networks from evolving threats, and supporting the design and deployment of secure optical communication systems empowered by AI and ML.

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Deadline for manuscript submissions

20 October 2026

Applied Sciences

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 5.5

mdpi.com/si/255266

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As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

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