



## About the Cover: *Advanced Photonics Nexus* Volume 4 Issue 5

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Optical computing presents a transformative path beyond the limitations of traditional electronics by enabling information processing at the speed of light. One promising application is feature extraction in the optical domain, which offers low latency and high throughput for advanced data processing tasks.

In the article “High-speed and low-latency optical feature extraction engine based on diffraction operators” by Run Sun, Yuemin Li, Tingzhao Fu, Yuyao Huang, Wencan Liu, Zhenmin Du, Sigang Yang, and Hongwei Chen, the authors introduce OFE<sup>2</sup>—a high-speed, low-latency optical feature extraction engine.

OFE<sup>2</sup> is an integrated optical chip designed to perform rapid feature extraction for applications such as quantitative trading. The cover image of *Advanced Photonics Nexus* Volume 4 Issue 5 illustrates OFE<sup>2</sup> in action, generating immediate trading decisions from real-time price sequences.

Operating at 12.5 GHz, OFE<sup>2</sup> processes live gold price data to produce instant buy and sell signals with record-low latency. The system utilizes optical diffraction to perform matrix–vector operations, enabling efficient, parallel computation with minimal energy consumption. A built-in data preparation module ensures stable, coherent operation and supports online optimization, allowing the system to autonomously improve its trading performance.

By shifting the critical task of feature extraction from electronics to photonics, this work highlights the potential of optical computing to accelerate intelligent decision-making in latency-sensitive domains. It paves the way for hybrid AI systems that combine the speed of photonics with the adaptability of machine learning.