Budowa Silesia Photonics

Optical Spatial Modulator Mode Decomposition

Overview

Mode decomposition is a powerful tool for analyzing the modal content of optical multimode radiation. There are several basic principles on which this tool can be implemented, including near-field intensity analysis, machine learning, and spatial correlation filtering (SCF). The latter is meant to. With the success of deep neural networks (DNNs), AI-driven mode decomposition (MD) has emerged as a leading solution for MMFs. Additionally, achieving the. Chenxin Gao, Chengjiu Wang, Zhenghao Jiao, Bo Cao, Xiaosheng Xiao, Changxi Yang, and Chengying Bao,†State Key Laboratory of Precision Measurement Technology and Instruments, Department of Precision Instruments, Tsinghua University, Beijing 100084, China. With the commercialization of liquid crystal devices, digital holography as an enabling tool has be-come accessible to all, and with it all-digital tools for the decompo-sition of light has finally. Acquiring precise information about the mode content of a laser is critical for multiplexed optical communications, optical imaging with active wave-front control, and quantum-limited interferometric measurements.

Article Content

Mode Decomposition Method for Investigating the Nonlinear ...

We overview our recent experimental studies on the nonlinear spatial reshaping of multimode beams at the output of multimode optical fibers.

Metasurface-enhanced spatial mode decomposition | Phys. Rev. A

Here, we report a proof-of-principle demonstration of mode decomposition with a metasurface, resulting in significantly enhanced precision.

Accuracy of Holographic Real-Time Mode Decomposition Methods

Mode decomposition is a powerful tool for analyzing the modal content of optical multimode radiation. There are several basic principles on which this tool can be implemented, ...

Spatial mode decomposition for fiber lasers

To address the issues of large model size, difficult deployment, and long training time in traditional neural network-based mode decomposition methods, this work proposes a mode ...

FPGA-accelerated mode decomposition for multimode fiber ...

In this work, we propose using field-programmable gate arrays (FPGAs) to perform neural network inference for MD, marking the first use of FPGAs for this application, which is important, since the ...

Universal photonic processor for spatial mode decomposition

In this paper, we introduce a new modal decomposition technique based on a 16-pixel reconfigurable photonic integrated circuit programmed as a spatial mode decomposer. This device...

Mode decomposition of multimode optical fiber beams by phase-only ...

In this work, based on a computer digital holography method using a phase-only spatial light modulator (SLM) as a correlation filter, we experimentally demonstrate a method of mode ...

Accuracy of Holographic Real-Time Mode ...

Mode decomposition is a powerful tool for analyzing the modal content of optical multimode radiation. There are several basic principles on which this ...

Creation and detection of optical modes with spatial light modulators

We show by experimental implementation how digital holograms may be used to infer the intensity, phase, wavefront, Poynting vector, polarization, and OAM density of some unknown optical field.

Modal analysis of structured light with spatial light modulators: a ...

Here, we present a practical tutorial on how to perform an efficient and effective optical modal decomposition, with emphasis on holographic approaches using spatial light modulators,...

Observation of spatiotemporal stabilizer in a multi-mode fibre laser

Here, we report experimental observation of such a spatiotemporal stabilizer in STML, by embedding a spatial light modulator (SLM) into a multi-mode fibre (MMF) laser. Mode decomposition ...

Modal analysis of structured light with spatial light ...

Here, we present a practical tutorial on how to perform an efficient and effective optical modal decomposition, with emphasis on holographic ...

Spatially degenerated mode decomposition for few-mode fibers

A mode decomposition algorithm for spatially degenerated modes within few-mode optical fibers is proposed. This proposed algorithm recovers the mode coefficients of two orthogonal ...

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For more information, pricing, or custom solutions, please contact us:

Website: https://budowasilesia.pl
Email: contact@budowasilesia.pl
Phone: +48 537 192 846
Address: ul. Chorzowska 45, 40-001 Katowice, Silesian Voivodeship, Poland

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