Transmitting images through a single multimode fiber using deep learning.

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Due to its high modal density, a single multimode fiber is now recognized as an extremely efficient tool to transmit single images with bold implications for researchers working in optical endoscopy and telecommunications. A variety of mechanisms have been proposed to mitigate modal mixing within the fiber. Recently, machine learning has been recognized as a powerful alternative to interferomic techniques as it does not require complex optical setups and is inherently resilient to environmental perturbation of the fiber transmission matrix. In this presentation I show how the transmissive capacity and reconstructive fidelity of the fiber can be enhanced by applying a variety of optical and analytical techniques. Specifically, by applying an additional holographic encoding within the dataset the transmissive capacity of the fiber can be enhanced.

Short Bio:

Liam Collard received his PhD degree in applied optics from the University of Leicester. He was a researcher in the Italian Institute of Technology in endoscope development from 2019-2024. He is currently a researcher at Kings College London.