Diffractive neural network for wavefront shaping

Ultrafast Optics – Prof. Stefan Nolte

Topic (problem definition):

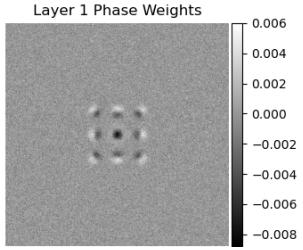
- Diffractive neural networks (DNN) is an innovative approach at the intersection between deep learning and optics
- Neural networks are designed to control complex wavefronts, manipulating the phase and amplitude of light

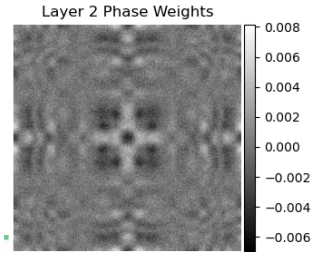
Research Focus:

- Material processing with ultrashort laser pulses.
- Processing with structured beams

Tasks:

- Learn the fundamentals of machine learning in photonics
- Train a DNN to predict desired output by obtaining optimum configuration of the phase elements
- Familiarity with Python, desirable





Scientific Profile

Basic research — Applied research

Lab work — Simulation

New setup — Tested setup

Language English

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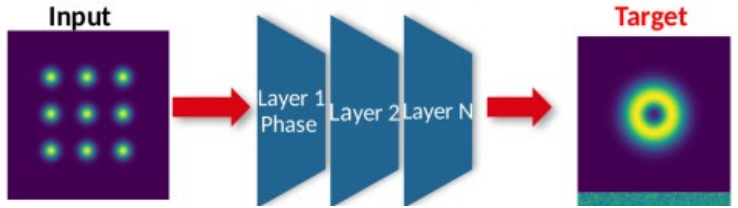

Schematic of diffractive neural network