Nonlinear wavefront sensing and control using Machine Learning

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Abstract

Fourier-filtering wavefront sensors, such as the Pyramid and Zernike, generally have nonlinear response to incoming wavefront aberrations. In this talk I will demonstrate techniques to mitigate these nonlinearities using Neural Network reconstructors or controllers. Finally, I will show that one can embrace these nonlinearities and use gradient-based optimization of the wavefront sensor design to improve its performance.

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