**Optical phase retrieval with the image of intensity in the focal plane based on the convolutional neural networks**

**基于卷积神经网络的焦平面强度图像光学相位检索**

1.在Direct determination中哪里提到该文章

In microscopy, ANNs are beginning to find use in both indirect[23–25] and direct aberration sensing methods[26–28].

The variation in performance between ANNs is symptomatic of overfitting [26], where a selection of aberration functions in the test data set that are close to the magnitudes and polynomials in a training data set are predicted better than others.

2.该文章逻辑是什么

Introduction

波前传感器的发展，特征，缺点

Theoretical foundations

Wave aberrations

波像差定义

即便大小进一步增发，无法恢复相差

Neural network

神经网络介绍

用了卷积神经网络

Training data

训练集

不同的测试组

Neural network implementation

定义了损失函数

Architecture optimization

利用dropout避免过度拟合

Final result

最后结果很好

Results

3.该文章核心是什么？

这篇文章与Ben的很像，使用卷积神经网络技术根据测得的点色散函数补偿波前像差，着重提到了神经网络会遇到过度拟合问题，用dropout算法可以解决该问题。

4.英语表达该文章核心

This article is very similar to Ben's. It uses convolutional neural network technology to compensate wavefront aberrations based on the measured point dispersion function. It emphasizes that neural network can avoid overfitting problems and its solutions-dropout.