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CSCI779

Bonus Assignment

Here's a comprehensive report on two notable datasets and resources related to phase-contrast microscopy, reflecting advancements in imaging techniques and computational methods:

**LED Array 2D Fourier Ptychography Dataset:** This dataset offers images captured from 293 different LED illumination angles using a 4x 0.1 NA objective, which allows for Fourier ptychography reconstruction with an enhanced numerical aperture. The method used significantly increases the resolution beyond the objective's limit, up to approximately NA~0.6. This dataset is particularly valuable for exploring high-resolution imaging techniques and computational reconstruction methods in microscopy.

Data: <https://drive.google.com/drive/folders/0Bwoz65fi7IAEVFdod3pEWFQxcnc?resourcekey=0-CRclDZc-j1Lq47VNjlRTlA>

**Fourier Ptychography: Data-Driven Design and Physics-Based Learned Design**: These datasets and accompanying Python/PyTorch implementations focus on Fourier ptychographic microscopy, a method that uses LED illumination patterns to enhance image resolution. The approach allows for optimized experimental designs based on data-driven and physics-based methodologies. These resources are ideal for researchers looking to refine imaging setups for quantitative phase imaging. Details and code are available through various projects hosted on GitHub and discussed in publications linked from [Laura Waller's lab website](http://www.laurawaller.com/).

Data: <https://drive.google.com/drive/folders/19eQCMjTtiK8N1f1nGtXlfXkEa8qL6kDl>