

# Using Machine Learning for Regularization in Cryo-EM

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Due to the extremely low signal-to-noise ratio in Cryo-EM data, regularization is required to interpret raw data and to improve processing outcomes. Traditional approaches such as the Fourier Shell Correlation and Wiener filtering often fail to capture the complexity of the data, leading to local overfitting and overinterpretation. Convolutional neural network-based denoisers can be trained on arbitrary noisy data with the noise2noise approach, and achieve performance comparable to denoisers trained with noise-free data. In my talk, I will show that these models are particularly well suited for regularizing Cryo-EM data and can be coupled with various other image processing algorithms to improve results.