

Abstract Submitted
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Linear Image Restoration of Sets of Images with Residual Misalignments PHILIP BALDWIN, PAWEL PENCZEK, University of Texas - Houston Medical School — In cryo-electron microscopy, images are collected in the form of 2-D projections of 3-D macromolecular assemblies of unknown shape. These 2-D images suffer from a very low signal-to-noise- ratio. In order to proceed with reconstructing a 3-D model, individual images are aligned and then classified. Class averages are then formed by averaging the resulting aligned images. Unfortunately, it is difficult to completely eliminate alignment errors from the alignment procedures; the high- frequency components in the resulting class-averages are therefore deteriorated. We propose to use (two-point) correlation functions to provide estimates for the variances in the alignment parameters. With estimates of the variances at hand, one can use a linear procedure to find better estimates of class averages, where the blurring due to the initial misalignments has been corrected for. Tests are performed on a variety of real protein data.

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