Undergraduate Honors Thesis Defense

The Effects of Projection on Iterative Methods in Image Deblurring

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Abstract: Applications of iterative regularization methods encompass a broad spectrum, including image deblurring. One unique feature in image deblurring problems is the non-negativity of the solution. In light of this knowledge, this thesis explores the effectiveness of three projected iterative methods for image deconvolution: projected successive over-relaxation method(SOR), projected Landweber method, and an interior point gradient method. Specifically, this thesis compares the effectiveness of these methods to the standard un-projected SOR method, comparing quality of image reconstruction and the cost of each method. The thesis begins with an introduction to the field of image deblurring problems, iterative regularization, and the methods tested, and follows with experiments and analysis designed to determine the usefulness of these methods for image deblurring.

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