Alternating Direction Optimization for Imaging Inverse Problems

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This talk will review our recent work on the application of the alternating direction method of multipliers (ADMM) to several imaging inverse problems. We will show how ADMM provides an efficient and modular optimization tool, which allows addressing a variety of problems (namely, image restoration and reconstruction, under Gaussian, Poissonian, or multiplicative noise) using several different types of regularizers (such as total variation, frame-based analysis, frame-based synthesis, or hybrid analysis-synthesis regularization), and formulations (constrained or unconstrained optimization). We will also describe very recent work on the use of ADMM for blind deconvolution and in dealing efficiently with non-periodic boundary conditions.