WICHITA STATE UNIVERSITY
Department of Mathematics, Statistics & Physics

Visiting Candidate for Assistant Professor Position

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"Variational methods for ill-posed inverse problems"

Abstract:

Discrete ill-posed problems arise in many areas of science and engineering. Their solutions, if they exist, are very sensitive to perturbations in the data. Regularization aims to reduce this sensitivity. Many regularization methods replace the original problem with a minimization problem with a fidelity term and a regularization term. The first term aims at reconstructing a solution that fits the measured data, while the latter enforces some a priori information on the reconstructed solution, e.g., sparsity in some transformed domain or low rank. The relative importance of these terms is determined by a regularization parameter.

In this talk we present different variational methods for ill-posed inverse problem. We construct appropriate data fitting and regularization terms. The constructed terms may be non-convex and non-smooth, thus we study their properties to ensure the existence and stability of minima. More-over, we ensure that the constructed functionals determine regularization methods, i.e., we show that, as the noise that affects the data converges to zero, the global minima of the functional con-verge to a solution of the unperturbed system. We provide algorithms for the computation of a stationary point of the constructed functionals and we show their convergence. Finally, we provide, for some selected methods, practical rules for the selection of the regularization parameter.

Monday, March 18, 2019
3:00 PM in 128 Jabara Hall

Please come join us for refreshments before the lecture at 2:30 p.m. in room 353 Jabara Hall.