Auburn Montgomery

Department of Mathematics

Colloquium/$\mathcal{MAMS}$

Time: Friday, February 28, 2014, 2:00pm–3:00pm

Place: Auburn Montgomery, Goodwyn Hall, Room 202

Speaker: Professor Lixin Shen, Syracuse University

Title: Fixed-point Approaches for Optimization Problems in Signal/Image Processing

Abstract: In this talk, we introduce a class of fixed-point proximity algorithms for solving optimization problems in the context of image processing. The objective functions of such optimization problems are the sum of two convex functions having one composed with an affine transformation which is often the regularization term. We are particularly interested in the scenario when the convex functions involved in the objective function have low regularity (not differentiable) since many practical problems encountered in image processing have this nature. We characterize the solutions of the optimization problem as fixed-points of a mapping defined in terms of the proximity operators of the two convex functions. The algorithmic and mathematical challenges come from the fact that the mapping is a composition of a firmly nonexpansive operator with an expansive affine transform. A class of iterative schemes are developed based on the fixed-point equations that characterize the solutions. The convergence analysis of the proposed algorithms is given.

There is also a Math Club and Engineering Club social gathering starting at 1:30pm.
****Refreshments will be served at 1:30pm****

This event is supported by the AUM Lecturer's Program.