Math 296 - Graduate Student Colloquium

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From local optimization to global optimization, and from matrix to tensor

Abstract:
This talk gives an introduction to the most recent advances in optimization and numerical linear algebra. In classical optimization theory, much has been known about local optimizers. There are standard conditions for local optimality, like the Karush-Kuhn-Tucker (KKT) condition, second order sufficiency condition (SOSC), strict complementarity condition (SCC). There are no such conditions for global optimality in nonlinear programming theory. However, when all the functions are polynomial, there is a global optimality condition, which are closely related to KKT, SOSC and SCC.

In numerical linear algebra, much has been known about matrix computations, like ranks, eigenvalues, singular value decompositions, low rank approximations and matrix completions. Tensors are natural generalizations of matrices, arising from wide applications. Similar questions like for matrices need to be solved for tensors. However, such questions are mostly open for tensors.

This talk will give an overview of the new research results in the area, as well as the remaining challenges.

Host: Ioan Bejenaru

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