

*Department of Mathematics,
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Math 278C - Optimization and Data Science Seminar

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Tensor data analysis and applications

Abstract:

In this talk, I will present several works related to tensor data analysis. Firstly, hypergraph matching (HGM) is a popular tool in establishing corresponding relationship between two sets of points, which becomes a central problem in computer vision. We reformulate HGM as a sparse constrained model, and show its relaxation problem can also recover the global optimizer. A quadratic penalty method is presented to solve the relaxation model. Secondly, the analytic connectivity (AC) is an important quantity in spectral hypergraph theory. The definition of AC involves a series of polynomial optimization problem (POP). The number of POPs can be reduced by the structure of hypergraphs. Further, we proposed a simplex constrained model, a equality constrained model and a sparse constrained model for computing AC under different situations. Thirdly, identifying new indications for known drugs, i.e., drug repositioning (DR), attracts a lot of attentions in bioinformatics. We develop a novel method for DR based on projection onto convex sets.

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