1147-65-197   **Yifei Lou***, 800 W. Campbell Rd, Richardson, TX 75080. *Nonconvex Approaches in Data Science.*

Although "big data" is ubiquitous in data science, one often faces challenges of "small data," as the amount of data that can be taken or transmitted is limited by technical or economic constraints. To retrieve useful information from the insufficient amount of data, additional assumptions on the signal of interest are required, e.g. sparsity (having only a few non-zero elements). Conventional methods favor incoherent systems, in which any two measurements are as little correlated as possible. In reality, however, many problems are coherent. I will present two nonconvex approaches that work particularly well in the coherent regime. I will address computational aspects in the nonconvex optimization. Various numerical experiments have demonstrated advantages of the proposed method over the state-of-the-art. Applications, ranging from super-resolution to low-rank approximation, will be discussed. (Received January 08, 2019)