Atomic Representation-based Classification

Luoqing Li
Faculty of Mathematics and Statistics, Hubei University, China
Email: lilq@hubu.edu.cn

Representation-based classification (RC) methods such as sparse RC (SRC) have attracted great interest in pattern recognition recently. In this talk, we introduce a new condition called atomic classification condition (ACC), which reveals important geometric insights for the theory of ARC. We establish the theoretical guarantees for a general unified framework termed as atomic representation-based classification (ARC), which includes most RC methods as special cases. We show that under such condition ARC is provably effective in correctly recognizing any new test sample, even corrupted with noise. Numerical results are provided to validate and complement our theoretical analysis of ARC and its important special cases for both noiseless and noisy test data.