Session 1: Optimization Methods
11:20 – 11:40, 14th, July

Robust Low Rank Tensor Completion with Regularized Redescending M-estimator
Yuning Yang, Department of Electrical Engineering, KU Leuven

Arising from real-world applications such as image/video processing, intelligent transportation systems as well as pattern recognition, the problem of recovering data with certain low rank structure from incomplete observations can be formulated as low rank tensor completion problems. Since real-world data might be contaminated by sparse gross errors, robust techniques are demanded. However, existing approaches may not be very robust to outliers. To address this problem, we employ redescending M-estimators, which has been introduced in robust statistics, into tensor completion problems. Redescending M-estimators bring us robustness, whereas they also lead to nonconvexity. Nevertheless, by verifying the Lipschitz continuity, we can solve our approaches by block coordinate descent type methods and prove the convergence of the methods. The proposed methods produce satisfactory results, as demonstrated by experiments on synthetic as well as real data sets.