1106-41-1081 **Xin Li*** (xin.li@ucf.edu), 4000 Central Florida Blvd, MSB207, Orlando, FL 32816, and **Aritra Dutta**. *Weighted low-rank matrix approximation: a new algorithm based on optimization.* Preliminary report.

Weighted low-rank (WLR) matrix approximation has many important applications in data analytics. Except in very special cases, there is no closed form solution. Many numerical algorithms have been proposed, among which most are based on some form of matrix factorizations. In this talk, we will report a new algorithm that is based on convex optimization. More precisely, we treat the problem as a constrained minimization problem with weighted matrix norm and solve it by using a unconstrained formulation. Indeed, when the Frobenius norm is used, the problem of low-rank approximation is equivalent to Principal Component Analysis. Recently, in studying the (unweighted) low-rank approximation problems, Yi Ma and his collaborators proposed Robust Principal Component Analysis by considering augmented Lagrange formulation of the constrained minimization problem using other meaningful matrix norms (like the nuclear norm, ℓ_1-norm). We are applying Yi Ma's idea to solve the weighted low-rank approximation problem. Our numerical experiments show that the algorithm works effectively and efficiently in comparison to the several existing state-of-the-art algorithms. (Received September 10, 2014)