

# Subspace Methods for Large Scale Nonlinear Equations and Nonlinear Least Squares

Yaxiang Yuan

Institute of Computational Mathematics, Chinese Academy of Sciences

email: `yyx@lsec.cc.ac.cn`

In this talk, we consider large scale nonlinear system of equations and nonlinear least square problems. We present subspace methods for solving these two special optimization problems. The subspace methods have the characteristic to force the next iteration in a low dimensional subspace. The main technique is to construct subproblems in low dimensions so that the computation cost in each iteration can be reduced comparing to standard approaches. The subspace approach offers a possible way to handle large scale optimization problems which are now attracting more and more attention. Actually, quite a few known techniques can be viewed as subspace methods, such as conjugate gradient method, limited memory quasi-Newton method, projected gradient method, and null space method.