1154-VN-2828   **Mohammad Tabanjeh*** (`mt173@nyu.edu`), PO Box 129188, Saadiyat Island, Abu Dhabi, United Arab Emirates. *Preconditioning Techniques for solving ill-conditioned Large Linear Systems of equations.*

Matrix preconditioning is a popular tool for the acceleration of the solution of an ill-conditioned systems of linear equations. Our goal is to use the multiplicative and additive preconditioning techniques to accelerate the convergence of the iterative solution algorithms of an ill-conditioned system of linear equations and to achieve more accurate numerical solution in less time. We will propose a rank-one modification as alternative technique to the multiplicative preconditioning since the later method cannot be applied to structured or sparse matrices. Thus to achieve our goal, we will add a properly scaled random rank-one modification matrices or small-rank modification matrices to the input matrix A until we arrive at a well-conditioned matrix and a simplified solution. (Received September 18, 2019)