Solving A Matrix Polynomial By Conjugate Gradient Methods

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One of well known and much studied nonlinear matrix equation is the matrix polynomial which has the form $G(X) = A_0X^m + A_1X^{m-1} + \cdots + A_m$, where $A_0, A_1, \cdots, A_m$ and X are $n \times n$ real matrices. We show how the minimization methods can be used to solve the matrix polynomial $G(X)$ and give some numerical experiments. We also compare Polak and Ribiére version and Fletcher and Reeves version of conjugate gradient method.

This is a joint work with Hyun-Min Kim.