GRADUATE SEMINAR

Di Lu

On Newton's method and Halley's method for the matrix pth root

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November, 6, 2018
2:30 p.m.
Mathematics and Statistics Lounge, CW307.20

Abstract:

If A is a matrix with all eigenvalues in the disk $|z-1|<1$, the principal pth root of A can be computed by Newton's method or Halley's method. The study of Newton's method and Halley's method for the matrix pth root can be done through a study of power series expansions of some sequences of scalar functions. In this presentation, we prove monotonicity results for the coefficients in the power series expansions for both Newton's method and Halley's method, and for all integer $p \geq 2$. We then use these monotonicity results to obtain some very neat error estimates in the matrix case.

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