

## Large Scale Computation of Extreme Pseudospectral Functions

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The epsilon-pseudospectrum of a matrix has been put on a formal framework by Nick Trefethen. This is the subset of the complex plane comprised of the eigenvalues of all matrices within the epsilon neighborhood of the given matrix. Extreme points in these sets, such as the rightmost and outermost points, are of particular interest from a robust stability point of view. The talk concerns how these extreme points can be located numerically and effectively, by treating them in the context of a general eigenvalue optimization framework. In particular, the numerical scheme makes direct use of analytical properties of eigenvalue functions. The merits of such an approach as compared to the existing literature are substantial: (i) the approach can cope with *large scale* matrices; (ii) it carries over to the setting of *nonlinear eigenvalue problems* for locating the extreme points of associated pseudospectra.