Talk announcement

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15:30, S2 054 and via Zoom

A Newton's method for best uniform rational approximation

We present a novel algorithm, inspired by the recent BRASIL algorithm, for best uniform rational approximation based on a formulation of the problem as a nonlinear system of equations and barycentric interpolation. We derive a closed form for the Jacobian of the system of equations and formulate a Newton's method for its solution. The resulting method for best uniform rational approximation can handle singularities and arbitrary degrees for numerator and denominator. It typically converges globally and exhibits superlinear convergence in a neighborhood of the solution.

Interesting auxiliary results include formulae for the derivatives of barycentric rational interpolants with respect to the interpolation nodes, and for the derivative of the nullspace of a full-rank matrix.