Numerical Analysis and Scientific Computing Seminar

Degeneracy of eigenvalues and singular values of parameter dependent matrices

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Abstract: Hermitian matrices have real eigenvalues and an orthonormal set of eigenvectors. Do smooth Hermitian matrix valued functions have smooth eigenvalues and eigenvectors? Starting from such question, we will first review known results on the smooth eigenvalue and singular values decompositions of matrices that depend on one or several parameters, and then focus on our contribution, which has been that of devising topological tools to detect and approximate parameters' values where eigenvalues or singular values of a matrix valued function are degenerate (i.e. repeated or zero).
The talk will be based on joint work with Luca Dieci (Georgia Tech) and Alessandra Papini (Univ. of Florence).

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