



Department of Mathematics
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Seminar

Numerical Stability of Polynomial Eigenvalue Solvers

Professor Paul Van Dooren

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Abstract

In this talk we give a new class of linearizations of a polynomial matrix $P(s) = P_0 + P_1s + \dots + P_ds^d$ which could be called Fiedler-like linearizations of the polynomial matrix $P(s)$. The class contains the pencils defined in the work of Fiedler, but also those in the work of Antonio and Vologiannidis. The new characterization of pencils is quite straightforward and has a block structure that is much easier to describe than the derivations that were given in these earlier papers. Moreover, we show that applying the QZ algorithm to these pencils results in a backward error that can be mapped back to the coefficients $P_i, i = 0, \dots, d$, and this in a backward stable manner. Our new approach is heavily based on the concept of dual minimal polynomial bases, which we also discuss in this talk. Finally we show that these bases also allow us to extend our linearization results to several more general cases.

Date : January 4, 2017 (Wednesday)
Time : 4:30p.m. – 5:30p.m.
Venue : Room 222, Lady Shaw Building,
The Chinese University of Hong Kong

All are Welcome