

Meeting: 1001, Evanston, Illinois, SS 9A, Special Session on Solving Polynomial Systems

1001-12-194 **Yusong Wang*** (ywang25@uic.edu), 322 Science and Engineering Offices (SEO), m/c 249 851 S. Morgan Street, Chicago, IL 60607-7045, and **Jan Verschelde** (jan@math.uic.edu), 322 Science and Engineering Offices (SEO), m/c 249 851 S. Morgan Street, Chicago, IL 60607-7045. *Applying Pieri Homotopies to compute dynamic output feedback laws.*

The pole placement problem asks to find laws to feed the output of a plant governed by a linear system of differential equations back to the input of the plant, so that the resulting closed-loop system has a desired set of eigenvalues. In this talk, we first show the connection between dynamic output feedback pole placement and enumerative geometry. Then we will present the realization of the output of the Pieri Homotopies as a useful control feedback machine in the time domain, which will involve numerical calculations of greatest common divisor. An application will be presented to illustrate real feedback laws may be found with dynamic feedback method when all the static feedback laws have nonzero imaginary coefficients. We implemented a parallel version of Pieri Homotopy algorithm and observed the algorithm is suitable for parallel computing.

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