1001-08-129          **Hai-Jun Su\*** (`suh@eng.uci.edu`), Robotics Lab, Dept. of Mechanical and Aerospace Engineering, Irvine, CA 92697. *Using Polynomial Homotopy Method to Mechanism Synthesis.*

Polynomial systems arise in the kinematic synthesis of rigid and compliant mechanisms. They describe geometric and equilibrium constraints and the challenge is to solve these polynomials for the system configurations that satisfy these constraints. These equations can become complicated, and a homotopy algorithm, POLSYS_GLP designed for parallel processors has proven to be an effective solution tool.

The talk summarizes my research into the design of five degree-of-freedom chains with spherical wrists. The associated polynomial systems can have a total degree range from 32 for the PPS chain (plane) to over 4 million for the general RRS chain (torus). We then examine the recent research in the analysis and synthesis of compliant planar platforms. (Received August 19, 2004)