1046-14-1124 **Hai-Jun Su*** (haijun@umbc.edu), 1000 Hilltop Circle, Department of Mechanical Engineering, University of Maryland, Baltimore County, Baltimore, MD 21250. *Computational Algebraic Geometry for Mechanism Synthesis.*

The mechanism synthesis problem begins with a task defined as a set of goal positions for the end-effector of the mechanism. Finding a mechanism which achieves the design goals becomes increasingly complicated as we move from planar mechanisms to mechanisms that move more generally in space. Algebraic equations can be developed to define the design outcomes. The equation set, and therefore the computational complexity, increases exponentially as the mechanism space becomes more general. In this work, we are interested in applying polynomial homotopy algorithms solving for multiple candidate mechanisms. Recently this work has been successfully extended to the synthesis of compliant mechanisms. Compliant mechanisms gain at least some mobility from the deflection of flexible members rather than from movable joints only. These mechanisms hold promise in areas of manipulation; actuator, measurement devices etc. and are well suited for micro fabrication (MEMS). In this talk, a systematic way is proposed to synthesize compliant mechanisms for a specified set of equilibrium positions. The synthesis equations are transformed into a polynomial form and solved by homotopy solvers. (Received September 14, 2008)