1117-14-389   **Daniel A. Brake*** (`danielthebrake@gmail.com`), 152 B Hurley, Notre Dame, IN 46556, and **Jonathan D. Hauenstein**, **Andrew P. Murray**, **David H. Myszka** and **Charles W. Wampler**. *The complete solution of Alt-Burmester synthesis problems for four-bar linkages.*

Precision-point synthesis problems for design of four-bar linkages have typically been formulated using two approaches. The exclusive use of path-points is known as "path synthesis", whereas the use of poses, i.e. path-points with orientation, is called "rigid-body guidance" or the "Burmester problem". We consider the family of "Alt-Burmester" synthesis problems, in which some combination of path-points and poses are specified, with the extreme cases corresponding to the typical approaches.

The Alt-Burmester problems that have, in general, a finite number of solu- tions include Burmester's original five-pose problem and also Alt's problem for nine path-points. The elimination of one path-point increases the dimension of the solution set by one, while the elimination of a pose increases it by two. Using techniques from numerical algebraic

geometry, we tabulate the dimen- sion and degree of all problems in this Alt-Burmester family, and provide more details concerning all the zero- and one-dimensional cases. (Received January 18, 2016)