USING GEOMETRY TO MOVE ROBOTS QUICKLY

How do we move a robot quickly from one position to another? To answer this question, we need to understand its "space of possibilities", a “map” where we can find every possible position of the robot. Unfortunately, these spaces are very large, they live in very high-dimensions, and they are very difficult to visualize. Fortunately, algebraists have encountered and studied these kinds of spaces before. Thanks to the tools they've developed, we can build “remote controls” to navigate these complicated spaces; this allows us to move (some) robots optimally. It also makes us face ethical questions that we cannot ignore.

This talk is based on joint work with my students Arlys Asprilla, Tia Baker, Hanner Bastidas, Cesar Ceballos, John Guo, and Rika Yatchak. It will be accessible to a general audience, and assume no previous knowledge of the subject.