

Meeting: 1001, Evanston, Illinois, SS 15A, Special Session on Mathematical Problems in Robotics

1001-55-397 **Michael Farber*** (Michael.Farber@durham.ac.uk). *Collision-free motion planning.*

In the talk I shall describe a topological approach to the robot motion planning problem. This theory allows one to use the structure of the cohomology algebra of the configuration space of a robot to obtain numerical estimates on the character of instabilities appearing in the robot motion planning algorithms. This technique is applied to a number of specific problems which are interesting from both topological and robotics points of view: collision free motion planning of many objects moving in Euclidean spaces and on graphs, control of a rigid body in R^3 , simultaneous control of many independent objects and others. (Received August 31, 2004)