

Deployment algorithms for dynamically constrained mobile robots

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Abstract

Recent advances in communications, sensing and computation have made possible the development of mobile sensor networks and unmanned vehicles for remote exploration and monitoring tasks. The development of cooperative motion strategies has been fueled by this increasing demand. However, many dynamical models for these autonomous vehicles remain simple and are not accurate representations of a vehicle where such cooperative motion strategies may be physically implemented. In this talk, we will review the problem of cooperative deployment of autonomous vehicles subject to various constraints imposed by remaining power supplies, nonholonomic dynamics, and, focus specially on constraints due to external environmental forces. Theoretical convergence results are obtained in each topic and these are verified in simulation as well as in a robotic test bed developed at UCSD when applicable.