

A hybrid control architecture for autonomous mobile robot navigation in unknown dynamic environment

ABSTRACT

This paper introduces a new hybrid control architecture for solving the navigation problem of mobile robot in an unknown dynamic environment based on an actual-virtual target switching strategy. This hybrid architecture is a combination of deliberative and reactive architectures which consists of three layers: modeling, planning and reaction. The deliberative architecture produces collision-free with shortest-distance path, while using the reactive architecture generates safe and time minimal navigation path. The proposed approach differs from previous ones in its integration architecture, the control techniques implemented in each module, and interfaces between the deliberative and reactive components. Validity and feasibility of the proposed approach are verified through simulation and real robot experiments.