

Abstract

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Comparing Different Holonomic Mobile Robots

This paper presents a comparison between three different holonomic mobile robots. The first has three caster wheels with wheel angular velocities actuation; carries the name C3P. The second is omni-directional wheeled mobile robot and the third is a special holonomic robot configuration developed by ETH named Ramsis II. Inverse kinematic; forward dynamic models are presented for each robot for the simulation process. The simulation results illustrate the performance of each robot in comparison to the others. The comparison is done with respect to three main aspects 1) the mobility, 2) the total energy consumed by each robot in a finite interval of time, 3) the hardware complexity. A cost functional is obtained to demonstrate the comparison, a criteria is developed to measure the hardware complexity of each robot. The weight sum method enables the cost functional to show the importance of each aspect; to distinguish between the lowest cost platform with respect to each aspect importance.