Kinematic and dynamic approaches in gait optimization for humanoid robot locomotion

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Abstract

© Springer International Publishing AG 2018. Humanoid robot related research keeps attracting many researchers nowadays because of a high potential of bipedal locomotion. While many researchers concentrate on a robot body movement due to its direct contribution to the robot dynamics, the optimality of a leg trajectory has not been studied in details yet. Our paper is targeted to decrease this obvious gap and deals with optimal trajectory planning for bipedal humanoid robot walking. The main attention is paid to maximization of locomotion speed while considering velocity, acceleration and power limitations of each joint. The kinematic and dynamic approaches are used to obtain a desired optimal trajectory. Obtained results provide higher robot performance comparing to commonly used trajectories for control bipedal robots.

Keywords

Bipedal walking, Humanoids, Optimal trajectory planning

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