Prioritized Motion-Force Control of Multi-Constraints for Industrial Manipulators

Cai, Caixia; Somani, Nikhil; Rickert, Markus; Knoll, Alois

Abstract:
To synthesize whole-body behaviors interactively, multiple tasks and constraints need to be simultaneously controlled, including those that guarantee that the constraints imposed by the robot's structure and the external environment are satisfied. In this paper, we present a prioritized, multiple-task control framework that is able to control forces in systems ranging from humanoids to industrial robots. Priorities between tasks are accomplished through null-space projection. Several relevant constraints (i.e., motion constraints, joint limits, force control) are tested to evaluate the control framework. Further, we evaluate the proposed approach in two typical industrial robotics applications: grasping of cylindrical objects and welding.

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