Robotic Manipulator Path Planning Utilizing Interpolated 3D Voxel-Based Obstacle Avoidance Method

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Abstract

1 Introduction

2 Related Works

- method was inspired by Khatib APF (however, it evolved into a different method)
- different existing APF manipulator implementation articles
- VFH

3 Method

- optimization algorithm
- robot kinematics (include the exact-reduced method)
- primary task of distance goal
- secondary task of repulsive field
- task slowdown option
- secondary task of manipulation measure
- attractive field calculation (normalization of attractive force)
- repulsive field calculation - matrix "convolution" method
- matrix size and shape selection
- PLOT: (ERK) kernel graphics
- PLOT: (ERK) linear kernel graphics
- PLOT: kernel field shape
- interpolation of the repulsive field

4 Implementation

5 Experiments and simulations

- include execution times