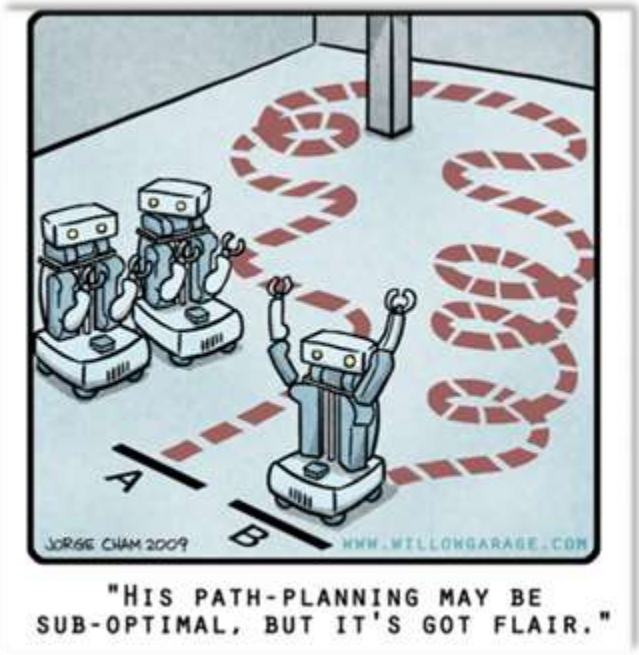

Instructional Suite for motion planning of articulated Robots with multiple links and polygonal obstacles

by

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INTRODUCTION

Motion planning has been an important problem in the history of robotics. Collision free path finding in planar space in the presence of stationary polygonal obstacles is a frequently encountered problem in motion planning. We can use several methods for finding collision free path in configuration space for an articulated robot with many arms. The following few methods are widely used to compute collision free path in the planar space.

1) Generalized Voronoi Graph
2) Probabilistic Roadmap Method
3) RRT (Rapidly-exploring Random Trees)

Here methods 2 and 3 are probabilistic while method is both deterministic and probabilistic.

MOTIVATION

These methods perform differently in learning and query phases in terms of accuracy, time and tolerance. To compute collision-free path and compare their methods is the primary motivation for making an instructional suite.

This suite will allow building articulated robots with many links and a set of polygonal obstacles, and then solve to find paths in this setting. The method to use can be specified by the user. The results can be used to compare the accuracy, time and tolerance of the methods.

APPROACH | IMPLEMENTATION

We divide the task into two parts:

1) Getting configuration settings for articulated robot and obstacle positions and shapes
2) Implement all three algorithms to find collision free path
3) Build some tests to compare the results obtained from three different algorithms.

We will be writing code in Matlab on Windows Matlab 2012.

REFERENCES

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