

Zhang, Bo; Zhang, Ling; Zhang, Tian

Motion planning of multi-joint robotic arm with topological dimension reduction method.

(English) [Zbl 0713.68083](#)

IJCAI 89, Proc. Int. Conf., Detroit, MI/USA 1989, 1029-1034 (1989).

[For the entire collection see [Zbl 0707.68001](#).]

The paper investigates the Findpath Problem (FP), and its applications to realizing a robotic arm motion planning. The FP consists in describing the 3-D configurations and obstacles, and determining a continuous collision-free motion of the robotic arm from one configuration to another (if there exists such a motion). From the existing methods, the authors concentrate on the topological approach, proving its potential of feasibility, efficiency, and accuracy of the method. Since the FP in physical space is equivalent to the investigation of the high-dimensional configuration space (C-Space), the authors study the connectivity of the C-Space with the topological dimension reduction method. A Pascal simulation program provides evidence that the dimension reduction method can be adopted in the first overall planning of real robotic arm system in the near future.

Reviewer: [N.Curteanu](#)

MSC:

- [68T20](#) Problem solving in the context of artificial intelligence (heuristics, search strategies, etc.)
- [68U05](#) Computer graphics; computational geometry (digital and algorithmic aspects)
- [68U99](#) Computing methodologies and applications

Keywords:

[robotic](#); [motion planning](#); [dimension reduction method](#)