

## عنوان مقاله:

Global Path Planning of Quadrotor Using Reinforcement Learning

## محل انتشار:

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## نویسندگان:

Mehdi Khakbaz - *Department of Electrical Engineering, Sabzevar Branch, Islamic Azad University, Sabzevar, Iran*

Majid Anjidani - *Department of Computer Engineering and Information Technology, Payame Noor University, Tehran, Iran*

## خلاصه مقاله:

This paper aims to improve the trajectory by an extended reinforcement learning based method in which a new tracking algorithm is used for mobile robot applications with low-rate control command. There are some trajectories that underactuated robots, like quadrotors, are unable to track; hence a suitable trajectory should be designed with respect to the robot's dynamics. In this paper, the initial trajectory is generated by Rapidly-exploring Random Tree Star algorithm which is not suitable for quadrotor application. Then, the initial trajectory is improved by an extension of Path Integral Policy Improvement with Covariance Matrix Adaption (PI<sub>2</sub>-CMA) algorithm. The extension includes improving tracking algorithm and controller performance considering low-rate control command. Our proposed algorithm succeeded to reduce the cost of tracking by designing safer and shorter trajectories which are more suitable for real robots. Furthermore, the results show that the proposed tracking algorithm and controller improve the performance of tracking. The hardware requirements for implementing our proposed method are a webcam and a personal computer; therefore with a low-cost implementation of the proposed method, a suitable trajectory is designed. In this paper, the initial trajectory is improved by an extension of PI<sub>2</sub>-CMA algorithm in which the trajectory tracking is performed such that reciprocating motions are avoided. Also, desired velocity and acceleration are used by controller for better tracking.

## کلمات کلیدی:

Quadrotor robot, Path planning, Trajectory tracking and Reinforcement learning

## لینک ثابت مقاله در پایگاه سیویلیکا:

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