عنوان مقاله:

کنترل موقعیت مبتنی بر بینایی کوادکوپتر AR.Drone 2.0 شناور با استفاده از منطق فازی

محل انتشار:

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خلاصه مقاله:

Autonomous hovering of AR.Drone 2.0 quadcopter, which is an important subject and prerequisite for other autonomous UAV applications, is the goal of this paper. We propose a new method, called GSPnP, for pose estimation using only the bottom camera of the robot. Moreover, an optimal fuzzy controller, called TGM, is designed in order to stabilize the quadcopter hovering. Then, the optimal parameter values for the controller are obtained.The current position of the robot, relative to the ArUco library marker, is computed using our proposed GSPnP algorithm and the images of the bottom camera. The current position is sent to the controller and the output is computed based on the ROS AR.Drone 2.0 driver and is sent to the robot simulated in the Gazebo world. The results indicate a more accurate and desirable performance of GSPnP method and TGM fuzzy controller in controlling the robot position compared with other methods with an error of less than 30, 40, and 20 millimeters in x, y, and z directions, respectively.

کلمات کلیدی:

Quadcopter AR.Drone 2.0, Autonomous hovering, PnP pose estimation, Fuzzy controller, Gazebo simulator, ROS

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