
A quadrotor controlled in real-time using hand gestures and ROS2 multi-node communication within GAZEBO 3D environment

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Abstract: This paper introduces a novel way of designing and controlling a quadrotor prototype using hand gestures, utilising the Robotic Operating System 2 (ROS2) and GAZEBO11 3D environment. A C++-based plug-in was created for GAZEBO, while the cross-platform pipeline framework Media-Pipe was used to manage the quadrotor's movements through hand gestures. The PID regulator was utilised to enhance the movements' accuracy and responsiveness, leading to a more efficient and precise response to user commands for a better user experience. The obtained results demonstrated that the PID regulator improved the response of the quadrotor to hand gestures with greater accuracy.

Keywords: Robotic Operating System 2; ROS2; quadrotor; GAZEBO; control; communication; hand gestures.

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Biographical notes: Hamza Djizi received his Master's degree from the University of Skikda, Algeria, and currently working toward his PhD in Electromechanical Engineering at the University of Souk Ahras, Algeria. His research interests include system control, robotics and artificial intelligence methods.