

ABSTRACT

As we move into the future our need for research into robotic systems will grow. The number of unmanned aerial vehicles has grown enormously as they are being used more and more for all sorts of applications ranging from military use to usage by the everyday photography enthusiast.

This dissertation has the main goal of modelling a drone and, additionally, creating a simulated world within which the drone can move freely. To accomplish this goal tools like ROS, GAZEBO, C++ and methods of parameter identification were used. Using a dynamic model of a quadrotor, a full model was created by adding the relation between the remote control and the input voltage of each motor. Furthermore, a 3D world of the university's lab was created for testing flight movement. Next a program was written to control the drone inside the 3D world by solving the dynamic equations and integrating the results to find the positions and angles. These communications between the program and simulation are done using ROS. Finally, after a series of tests from the simulation, a method of parameter identification was used to find the unknown parameters of the lab's quadrotor.

Even though the goal was reached, the results found were not perfectly accurate. With more development the desired information will be acquired but, in the meantime, we do have a good foundation for improvements and further developments.