

CONTROL SYSTEM DEVELOPMENT FOR QUAD-ROTOR VEHICLE BASED ON THE ANDROID PLATFORM

Recent years have seen the rapid growth of robotic systems to the point where they found their way in the market as consumer products in a society which is ever more reliant on the “machine” for completing various tasks.

This dissertation uses an Android platform device in the place of a microcontroller and a sensor platform, since the mobile smartphone can successfully replace both, on a quad rotor aerial vehicle. Making use of wireless communications, the device transmits the data acquired from the sensors to the Robot Operating System – ROS on a computer running Linux and acts as the server. The server receives the data and is responsible for processing them to ascertain the position of the quad rotor vehicle. This is done by using computer vision algorithms via the OpenCV library and a supervised layout on the ground below the vehicle. Afterwards, a control command is created from the knowledge of the desired position and the position that the vehicle holds at any time. The aforementioned command is being transmitted from the remote control of the vehicle which communicates with the server using a PCTx device, thus creating a control loop.

With the successful implementation of this system, it is being proven that a mobile smart device is capable of being a structural part of a mechatronic system.