

Sensitivity research of the gyro system tracking the ground target from the quadrotor in conditions of external disturbances impact

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Abstract: One of the most important elements of equipment for a Quadrotor Unmanned Aerial Vehicle (QUAV) is the observation head. It is used for automatic searching and tracking of ground targets, both mobile and stationary. Its task is to determine the position of the Target Line of Sight (TLOS). A Gyroscopic System (GS) was proposed as a control and stabilizing TLOS device. An important issue in this type of device is the problem of its control in the conditions of disturbances from the side of the maneuvering deck QUAV. In the paper was investigated the sensitivity (robustness) of the gyro system tracking the ground target from the quadrotor's deck on changing the parameters of its regulator, in the conditions of disturbances impact. It was shown which elements of the gain matrix are the most sensitive - their even slight deviation from the optimal values can lead to reduced effectiveness of target tracking and even loss of stability of the control system. The simulation tests of dynamics controlled GS were carried out in the Matlab/Simulink environment. Selected test results are presented in a graphical form.

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