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Barabanov A.E., Romaev D.V. (romaev@yandex.ru**)**
ITMO University

ASSESSMENT OF THE ROTATION FREQUENCY OF THE HELICOPTER ROTOR BY READING ON-BOARD SENSORS AND ITS USE IN THE AUTOPILOT DESIGN

This paper proposes a nonlinear stabilizing controller for small RC helicopters based on linear quadratic regulator with the rotation frequency of the rotor. The frequency is estimated by the readings of the onboard sensors. The rotation frequency of the rotor is part of the power and moments statements that are designed by the main and the tail rotors. Thus, it is one of the main parameters of the mathematical model of the helicopter movement. Even in balanced hovering the rotation frequency is not constant and drifts in a certain range. The essence of the introduced adaptive method is to use the proposed approach in assessment of the rotation frequency of the main rotor in the navigation filter and the stabilizing regulator.
Keywords: inertial navigation, RC helicopter, Kalman filter, autopilot, UAV, main rotor, height adjuster.

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