
Universal control laws of stabilizing longitudinal motion of different types of aircrafts

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The paper presents the analytically synthesized law of lateral movement stabilization. It is done for the linearized model of the fourth order lateral movement of an isolated single-rotor helicopter, which can be regarded as a universal model for the aircraft lateral movement of any type and which represents the MIMO system containing two entrances. The decomposition method of MIMO system modal control, which was previously developed by the authors, is the basis of the decomposition synthesis. To check the correctness of the problem, we perform mathematical modeling of the single-rotor helicopter lateral movement using stabilization laws synthesized analytically. We present graphs of transient processes of the helicopter lateral movement as well as component changes of the vector control during the implementation process of the synthesized control laws.

Keywords: MIMO-system, decomposition, analytical synthesis, longitudinal movement of aircrafts, dynamic system poles, control matrix

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