
Using techniques of statistical modeling data processing based on wavelet analysis to adjust UAV stabilization algorithms parameters

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The article describes the use of statistical modeling data processing techniques of unmanned aerial vehicle (UAV) motion based on the wavelet analysis to adjust the stabilization algorithms parameters due to the time-frequency analysis derived from the statistical modeling of transients. The initial values of the required parameters are obtained in accordance with the previously developed method of investigating the UAV motion stability based on constructing the stability regions, taking the tolerances into consideration. We examine the interrelation of the stabilization factors state in the stability regions and the characteristics of the respective transients in the case of linear and nonlinear models of UAV motion. We point out the advantages of using statistical modeling, followed by the wavelet analysis in relation to the deterministic approach for assessing the acceptability of the selected parameters of stabilization algorithms. We demonstrate the results of using the techniques for adjusting the stabilization algorithm parameters based on the of UAV rudder deflection angle analysis.

Keywords: *statistical modeling, data processing, motion modeling, UAV, transient, time-frequency analysis, wavelet analysis, Daubechies wavelets, stability region, stabilization algorithm.*

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