

عنوان مقاله:

A Novel Strategy for Designing and Manufacturing a Fixed Wing MAV for the Purpose of Increasing Maneuverability and Stability in Longitudinal Axis

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خلاصه مقاله:

In this study, a novel simple strategy is proposed to choose and accommodate an airfoil based on the effects of airfoil type and plan-form shape on the flight performance of a micro air vehicle. In this strategy, after defining flight mission, the weight of the micro air vehicle is estimated and then, aerodynamic parameters and thrust force are calculated. In the next step, some different plan-forms and airfoils are investigated to be selected for decreasing the stall region in high attack angles by open source software named XFLR5. Having calculated the aerodynamic center, the pitching moment needed to stabilize the micro air vehicle is computed. Due to the static margin, the airfoil camber line is changed to stabilize the micro air vehicle and then, its thickness is improved to reach to a high aerodynamic characteristic. To evaluate the software results, some flight tests are performed which then compared to the software results that show a good agreement. Finally, some adjustments and improvements are made on the micro air vehicle and then, its performance is obtained by the flight tests. The flight test results show it has an excellent aerodynamic performance, stability and maneuverability.

کلمات کلیدی:

Airfoil, Design Strategy, Plan, form, MAV, Maneuverability, Stability

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