微型飛機機翼 CAD/CAE/CAM 整合系統

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摘要

The essential of this paper is developing the integrated software of the procedures for a MAV Airfoil Design、Aerodynamic analysis and Computer-aided manufacturing .We modulize and normalize the Airfoil design and Aerodynamic analysis , then computerize all design .In addition to all equations of aerodynamic characteristic ,geometry ,flow condition ,angle of attack and lift coefficient ,pressure coefficient …etc.Those will be numericalized by complicated procedures,then interpreted by computer programs, displayed by windowalized talking menu, 3D animation .The final design airfoil model for a MAV will be transformed into CNC code ,submitted to the styrofoam cutter for a cutting process, then final NACA airfoil shape will be tested and analyzed. Besides, We take an exhaustive effort of development of this integrated software .So that we can refer this study as an example for our system engineering and system integration in the future.

Again we discuss thoroughly and consider the relationships between the parameters attack-angle, velocity and pressure distribution on the surface of airfoil, lift, drag and moment coefficient. We visualize the design and the analyzed results in our integrated program. We build up a simply database for airfoil design, so that we can utilize the data from reverse engineering assist model aircraft and MAV designs. In the end, we link this system with an automation Airfoil styrofoam cutter as computer-aided-manufacturing to completely accomplish this investigation.

關鍵字：MAV、Aerodynamics、IT、Wind tunnel Simulation、CAD、CAE、CAM