Conceptual design and Optimization of 2-seater Seaplanes

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Abstract

This paper presents the conceptual design and optimization of 2-seater seaplane. A design code was developed from MATLAB with optimization toolbox. Design synthesis contains aircraft weight, performance, aerodynamics, aircraft stability, engine sizing and ship hull design according to user requirements and Standard Specification for Design and Performance of a Light Sport Airplane. The seaplane take-off weight is used as the objective function to minimize subjected to design constraints. The optimization process makes use of the MATLAB GA-hybrid scheme (Genetic algorithm and Fmincon) which is faster and more efficient than the genetic algorithm or gradient-based approach. The optimum designs were obtained. The influences of design requirements and constraints were investigated. The outcome of program is an optimum design of a single engine 2-seater seaplane.

Keywords: Conceptual design, Seaplane, Optimization, GA, LSA