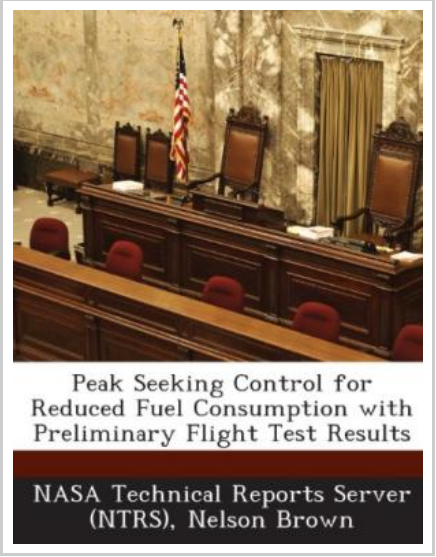

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Peak Seeking Control for Reduced Fuel Consumption with Preliminary Flight Test Results (Paperback)

By Nelson Brown

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.The Environmentally Responsible Aviation project seeks to accomplish the simultaneous reduction of fuel burn, noise, and emissions. A project at NASA Dryden Flight Research Center is contributing to ERAs goals by exploring the practical application of real-time trim configuration optimization for enhanced performance and reduced fuel consumption. This peak-seeking control approach is based on Newton-Raphson algorithm using a time-varying Kalman filter to estimate the gradient of the performance function. In real-time operation, deflection of symmetric ailerons, trailing-edge flaps, and leading-edge flaps of a modified F-18 are directly optimized, and the horizontal stabilators and angle of attack are indirectly optimized. Preliminary results from three research flights are presented herein. The optimization system found a trim configuration that required approximately 3.5 less fuel flow than the baseline trim at the given flight condition. The algorithm consistently rediscovered the solution from several initial conditions. These preliminary results show the algorithm has good performance and is expected to show similar results at other flight conditions and aircraft configurations.

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