Integrated Guidance-Control of Missiles*

By

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Abstract

Due to their potential for reducing weapon size and efficiency, integrated flight control system design methods are of significant research interest in the missile flight control community. This presentation discussed design methods that integrate the missile autopilot and guidance systems. The benefits of the integrated design and the difficulties in dealing with high-order nonlinear dynamics were discussed. Design philosophies outlined include zero-effort-miss, pure pursuit, proportional navigation and terminal-miss minimizing optimal finite-horizon control. The application of state-dependent Riccati equation method and the feedback linearization methodology for integrated design were summarized. Features of a software package that helps carry out nonlinear designs were outlined. Finally, engagement results were provided for an air-to-air missile and an internally actuated kinetic warhead.

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