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Paper Title: Development of a Flight Simulation Test-Bed for a General Propeller-Driven Unmanned Aircraft

### Abstract

This paper presents the development of a flight simulator for a fixed-wing propeller-driven UAV. A new architecture for UAV low-level functional units is presented. The work involves modeling main low-level units of the UAV, which includes modeling of aircraft lateral and longitudinal dynamics and controlling of flight-path states holding. Key characteristics for aerodynamics and propulsion properties are calculated. A nested PID loops are used to provide a low-level control necessary for intelligent control and mission planning and execution. Simulation results are demonstrated in order to validate the effectiveness of the flight simulator and thereby providing an infrastructure low-level abstraction platform that can be used for various multi-level algorithms testing.

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