



Modelling and Attitude Control for Tiltrotor UAV during Transition Flight Mode

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Abstract. Tiltrotor UAV is unmanned aerial vehicle which can take off and land vertically like helicopter and fly forward like a conventional fixed wing airplane. This process is called transition, tilting its rotors from vertical to horizontal and vice versa, which is the most critical flight mode due to its varying dynamics. This paper aims to present methodologies of designing control system for tiltrotor UAV, start with dynamic modelling. Model validation was done by comparing responses between flight test data and simulation in MATLAB Simulink. Then model reference adaptive control (MRAC) was designed and applied to adjust PID gains based on error between actual responses and responses from reference model for this tiltrotor UAV to control attitude roll and pitch response. Throughout transition flight mode, tiltrotor UAV can fly safely and able to stabilize itself along the flight.