

# Development and Implementation of a Guidance and Control System for a Micro Air Vehicle

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Unmanned aerial vehicles have become more applicable in daily life due to extended research and development of advanced technology through the last decades. This article aims to use understandable system descriptions and sensor models of aerial vehicles as a basis to design configurable state estimators and controllers, and to build a quadcopter well suited for autonomous missions. The open source quadcopter platform named Parrot Minidrone was chosen for the project. The first phase consist development of a mathematical model, which describe kinematics and dynamics of the quadcopter. Secondly, the control system is designed. The estimated models have been used to stabilize the quadcopter. Finally, the implementation phase and comparing the results with simulation performance, where step references and reference trajectories involving different path variation are tracked and compared. Ultimately, the developed system represents a convenient research tool that natively eliminate the gap between safety flight control and flight experimentation phase.