



German University in Cairo



Stanford University



ETH Zurich

SENSOR FUSION USING KALMAN FILTER FOR A QUADROTOR (POSITION ESTIMATION)

Quadrotors can be used in a variety of applications if equipped with appropriate sensors and control algorithms. One of the main advantages of quadrotors is its fast dynamics that allow them to perform aggressive maneuvers.

However, to autonomously control the quadrotor, its fast dynamics requires accurate and frequently updated knowledge about its attitude, velocity and position. Such knowledge can be provided by an inertial navigation system (INS). However, commercially available high quality ones are rather expensive, which motivates the development of navigation systems for quadrotors using low cost sensors. To measure the quadrotor's position, Global Navigation Satellite System (GNSS) receivers, such as Global Position System (GPS), can be used outdoors, however it depend on good satellite coverage.

The main objective of this project is the integration of a GPS receiver with inertial sensors to handle the dropouts of GNSS in simulation and practically on a Quadrotor platform developed in the German university in Cairo.



Spring 2014 Bachelor Projects

Background Knowledge:

- 1) State Space Analysis
- 2) Microcontroller
- 3) Communication Protocols

Skills Gained from Project :

- 1) Kalman Filter
- 2) Sensors Error Modeling
- 3) C++ Programming
- 4) MATLAB Programming

Primary Supervisor

Prof. Dr. Ayman El Badawy

Secondary Supervisor

Eng. Ramy Rashad