



German University in Cairo



Stanford University



ETH Zurich

## POINT-TO-POINT CONTROL OF A QUADROTOR

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.

In quadrotor systems, a hierarchical control approach is usually common. The low level control includes the rotor speed control loop. The next level includes the attitude control and finally the high level loop controls the position of the quadrotor.

The control objective of the high level controller is either to stabilize the quadrotor's at a desired point or to track a certain trajectory.

The objective of this project is to develop a control system to allow the quadrotor to reach a desired Cartesian position and a desired yaw angle while keeping the stabilization of the pitch and roll angles, both in simulation and practically on a Quadrotor platform developed in the German university in Cairo.



## Spring 2014 Bachelor Projects

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### Background Knowledge:

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- 1) PID Control
  - 2) Dynamics of Rigid Bodies
  - 3) Linear Algebra
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### Skills Gained from Project :

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- 1) Nonlinear Control
- 2) Java Programming
- 3) C++ Programming
- 4) MATLAB Programming

### Primary Supervisor

Prof. Dr. Ayman El Badawy

### Secondary Supervisor

Eng. Ramy Rashad