Team 28: HummingBird

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Concept & Motivation

- Concept
  - Glove based gesture control quadrotor
- Motivation
  - More intuitive and interactive way to control the vehicle
  - Implementing gesture controls without compromising the mobility
  - Can be used for surveillance explorations

Competitive Analysis

- AR Drone
  - Control interface based on mobile devices such as iPhone/iPad
  - Low programmability
- Swiss Institute of Technology Quadrotor
  - Gesture controlled quadrotor with Kinect camera
  - Low mobility

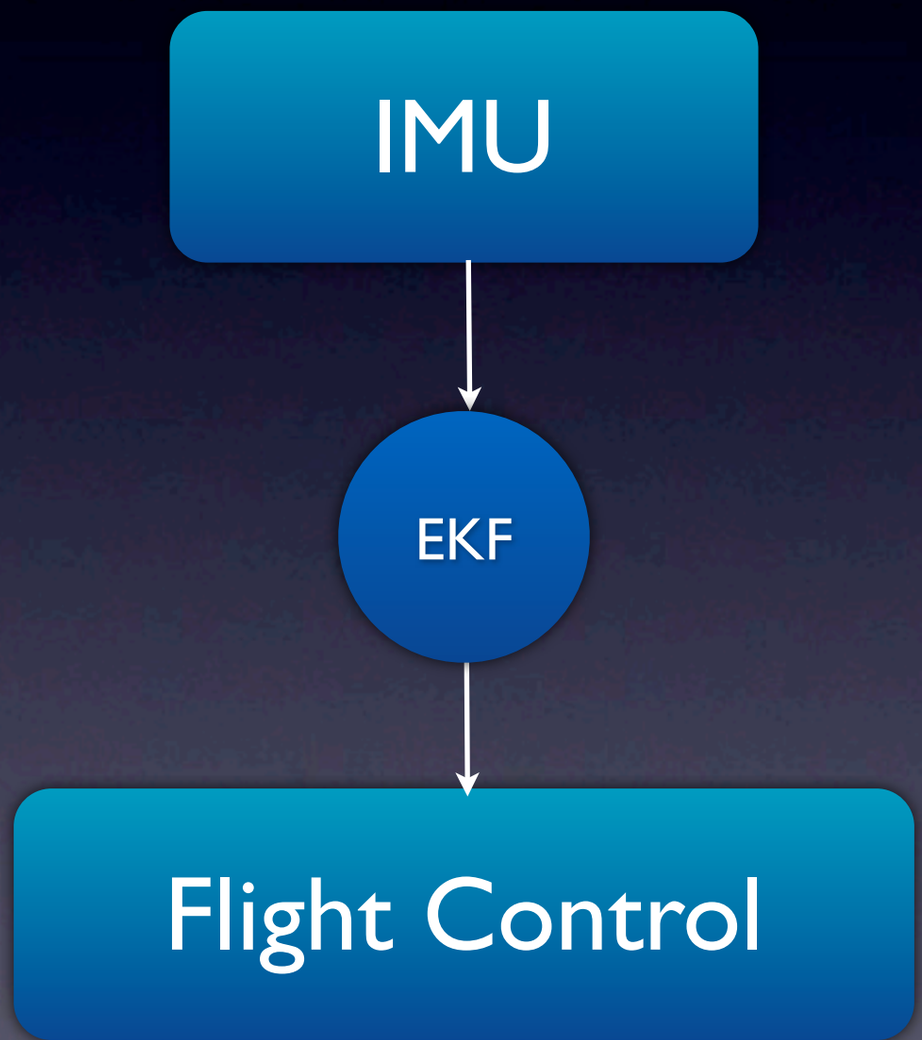
Requirements

- Functional
  - Fly smoothly
  - Land reliably
  - Accurate response
- Non-Functional
  - Wireless - 100m
  - Battery Life (.2 hrs)
  - < 0.05s response time
  - Handles reasonable amount of collision damage

Technical Specifications

- HW
  - Quadrotor Frame
  - Props
  - Motor + controllers
  - Processor
  - Battery
  - Wireless
  - IMU: ARM Cortex M4 stm32f4
- SW
  - Extended Kalman Filter

Architecture



Risk & Mitigation

Risk	Mitigation
Quadrotor doesn't fly	Buy an AR Drone
Gestures are too complicated to be recognized	Go with easy gestures such as tilts
EKF too difficult to implement	Try more basic sensor fusion algos such as KF
Cortex M4 board is difficult to use	Use another board that's capable of handling EKF calculations

Questions?