SE&M | Group Qi:

Building a Raspberry Pi

Autopilot

Project Outline

The project is divided in different modules. Once module 1 is finished, all modules can be worked on separately and are not dependent on the results of another module. The modules are furthermore divided in several tasks that can be assigned to different people. The basic requirements for the semester project will be met early on, after competition of module 1. Further modules can be added or replaced during this term.

# Module 1 – building a Raspberry Pi controlled quadcopter

**Goal:** quadcopter is assembled and it can fly. It is controlled via WIFI from a computer and it can be commanded from a first person view through the video stream.

## Task 1 [Getting the basics done]

1.1.1 – build the quadcopter with the radio controller and the *Ardupilot* chip;

1.1.2 – learn to fly the quadcopter;

## Task 2 [Raspberry communication]

1.2.1 – get an input over a wireless network to the *Raspberry Pi*;

1.2.2 – display the screen of a *Raspberry Pi* on another computer;

1.2.3 – get the commands from Xbox360 controller to the *Raspberry Pi*;

1.2.4 – attach the camera to the *Raspberry Pi* and stream the video to another computer;

## Task 3 [Raspberry power]

1.3.1 – find a portable power supply for the *Raspberry Pi*;

1.3.2 – attach the *Raspberry Pi* to the quadcopter;

1.3.3 – connect the *Raspberry Pi* with the *Ardupilot* chip;

## Task 4 [Taking command]

1.4.1 – map the commands from the Xbox360 controller;

1.4.2 – Test every axis separately;

## Task 5 [Fly it]

1.5.1 – fly quadcopter;

# Module 2 – extra commands

**Goal:** quadcopter has the option to react to voice commands and recognize faces/movements, using open source software.

# Module 3 – special maneuvers

**Goal:** *Autopilot* is modified, giving us more freedom in what we can do with the quadcopter. For example special moves, like a flip.

# Module 4 – app control

**Goal:** a 4G USB stick is mounted to quadcopter, allowing commanding it from anywhere. An android app is created for controlling it.

## Module 5 – musical drone

**Goal:** quadcopter is modified to play music, preferably the A-Team theme song.

# Module 6 – artistic drone

**Goal:** a spray can (or any other tool to paint) is mounted to quadcopter. It is combined with a program, so that quadcopter is capable of painting an image on wall.

# Module 7 – delivery drone

**Goal:** quadcopter has ability to pick up packages and carry them.

# Module 8 – battery surveillance

**Goal:** to build a communication between the quadcopter and user, so the user could watch over statistics of battery and/or Internet connection.