Lab 4 -Understanding Crazyflie Firmware I

There is no extra credit for Lab 4.

Download, Compile, and Flash Crazyflie with the vendor's firmware

Now we need to go back to the very first assignment of this course: download the crazyflie firmware source code from here, follow the instructions from here (under Compiling the copter code), compile the firmware, and flash it to the crazyflie (Make flash).

Install PC Client and Understand the GUI

Follow the instructions here to install the PC client with a GUI to control/log/bootload the crazyflie. Read this to understand the GUI. You should be able to fly the crazyflie while viewing flight data such as pitch, roll, and yaw.

Understanding Crazyflie firmware

Part 1

Disable the motors by commenting out the smallest number of lines of code possible. Please keep the motors disabled for this lab.

Part 2

Identify all the FreeRTOS tasks created by the firmware and their priorities.

Part 3

Identify the functions that compute the roll, pitch, and yaw of the crazyflie from the accelerometer and gyroscope readings (MPU6050). In the comments of the code, links are provided to a paper about the algorithms implemented. Read the papers and understand how the code implements the algorithms.

Test Your Understanding: Lab Report

The Lab Report should be submitted electronically (in letter size PDF, 11pt for main text) via email with all team members copied. The email should be titled exactly "[ELEC424] Lab 04 Crazyflie Firmware".

The report should contain the following information.

Credit Assigment

Explain the role of each team member; break down the 100% credit to team members.

Answers to Technical Questions

1. Part 1: which line(s) of code to comment out in order to disable the motors?

2. Part 2: what FreeRTOS tasks does the firmware create and what are their priorities?

3. Part 3: the firmware provides implementations of two different algorithms to compute the roll, pitch, and yaw. Which implementation does the firmware actually use? For the one used, please explain how the code implements the agorithm in the paper. (You can do so by putting code and the paper side by side.)