

Johns Hopkins University

Project 7

Quad Copter downloading GPS RPi to Host over WiFi

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EN.605.715.81.FA19 - Software Development for Real-Time Systems

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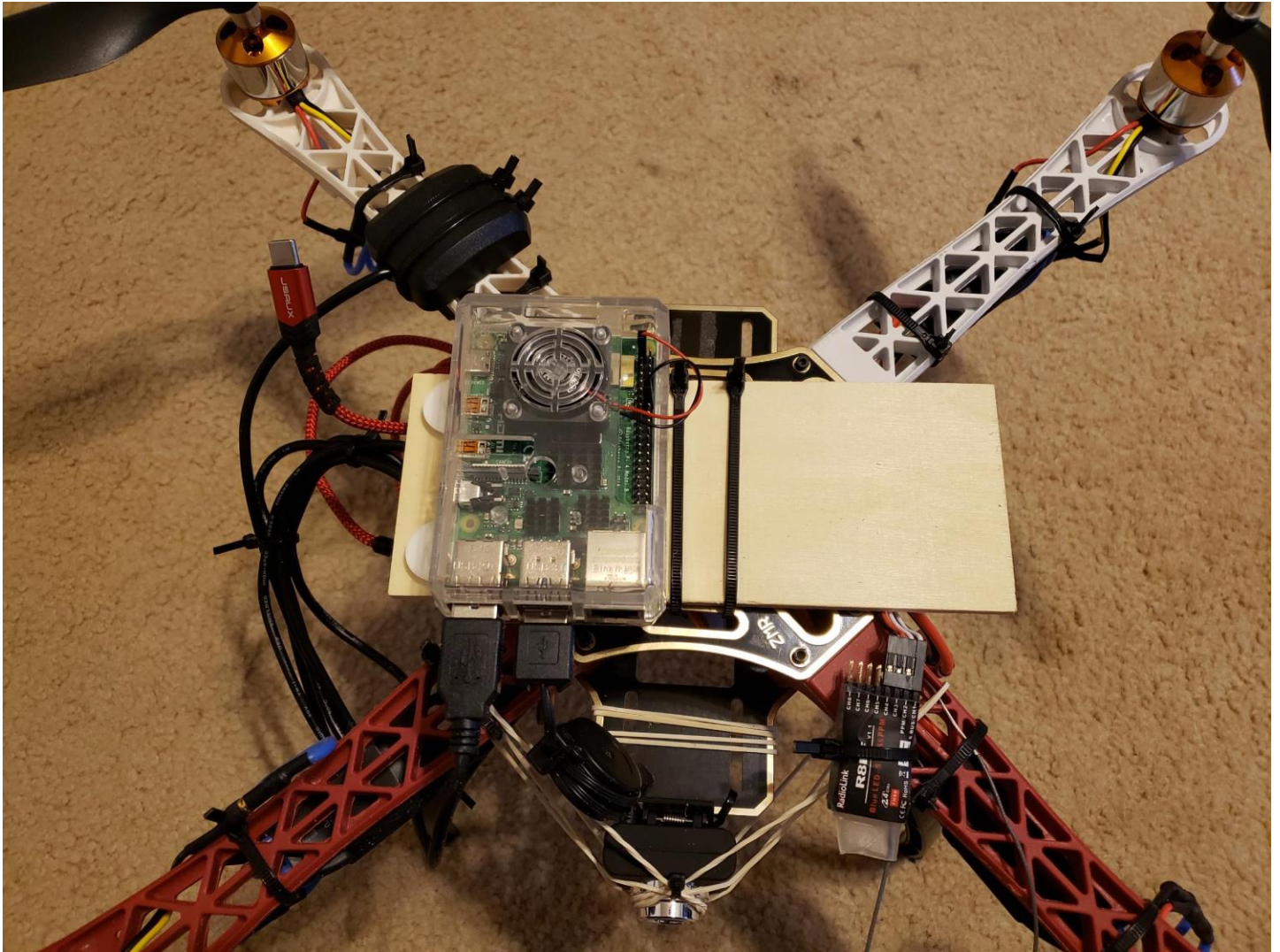
## Derived Requirements

The following requirements were derived from the Project 7 Quad Copter Downloading GPS RPiToHostWiFi document:

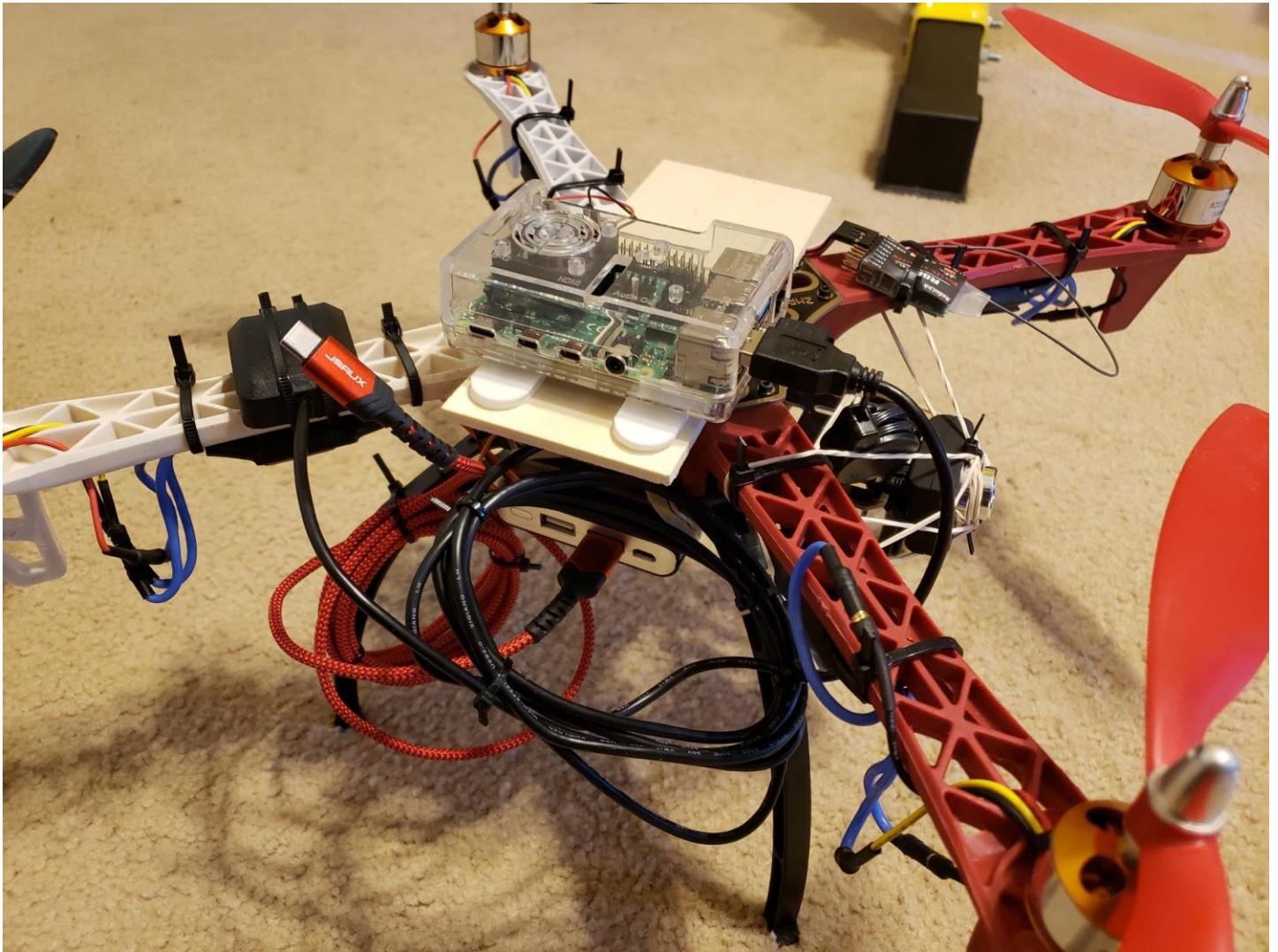
- The Raspberry Pi shall periodically read GPS data using the provided GPS receiver, and transmit the parsed GPS data over a socket to a host machine.
- The Raspberry Pi shall act as a wireless access point so that the host machine can connect to the Raspberry Pi over WiFi without a router.

## QuadCopter Layout

Top view of how the Raspberry Pi, camera, and GPS receiver are connected and attached to the Quadcopter:



Side view of how the Raspberry Pi, camera, and GPS receiver are connected and attached to the Quadcopter:

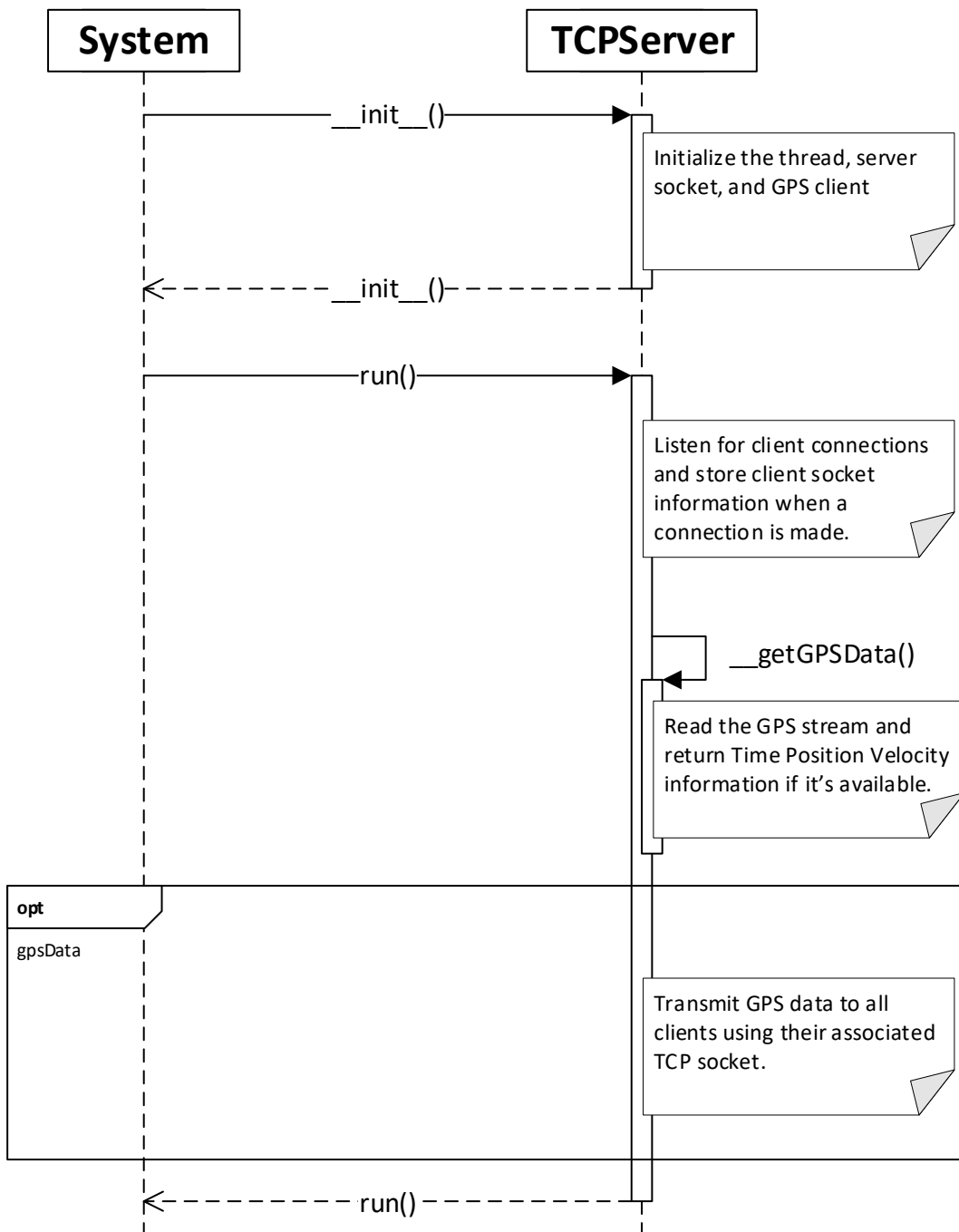




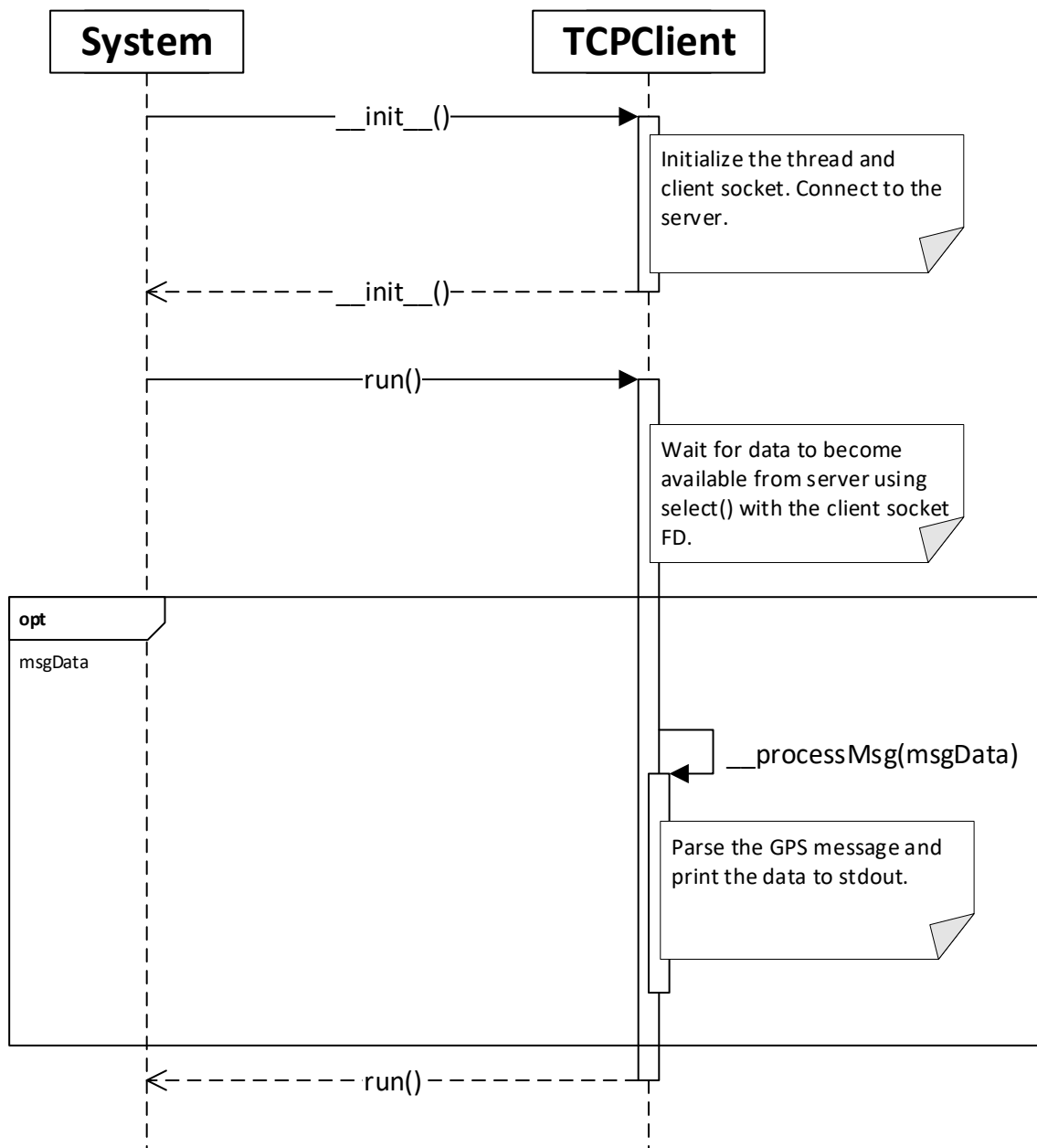
# Software Design and Implementation

## Sequence Diagrams

The following diagram is a sequence diagram of the server that reads and transmits GPS data to a client:



The following diagram is a sequence diagram of the client that receives the GPS data from the server and prints the information to stdout:



## Video Demonstration

The following videos demonstrate the Raspberry Pi streaming GPS data from the quadcopter to a host machine. The first flight had an issue where I clicked in the powershell window, causing it to scroll down and not show the GPS data. However, the webcam stayed active and I was able to land the quadcopter in the first flight, which I wanted to showcase here. The second flight showcases the GPS data being streamed to the host, but the webcam cuts out during the flight and I was not able to land the vehicle. It seems like I lost the wireless connection at some point in flight 2, which might explain why the webcam cuts out.

### Flight 1

<https://www.youtube.com/watch?v=s0nizHzFCs>

[https://www.dropbox.com/s/ch25858gqyya9pp/Miles\\_Gapcynski\\_EN\\_605\\_715\\_81\\_Project\\_7\\_Flight1.mp4?dl=0](https://www.dropbox.com/s/ch25858gqyya9pp/Miles_Gapcynski_EN_605_715_81_Project_7_Flight1.mp4?dl=0)

### Flight2

[https://www.youtube.com/watch?v=iu\\_GOpGEQFE](https://www.youtube.com/watch?v=iu_GOpGEQFE)

[https://www.dropbox.com/s/gd0p6ua3qxd9xy/Miles\\_Gapcynski\\_EN\\_605\\_715\\_81\\_Project\\_7\\_Flight2.mp4?dl=0](https://www.dropbox.com/s/gd0p6ua3qxd9xy/Miles_Gapcynski_EN_605_715_81_Project_7_Flight2.mp4?dl=0)