



Project Notebook

Area Coverage Optimization

Amr Elhussein

aelhussein@mail.bradley.edu

Beginning May 2019

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Wednesday, May 08, 2019

Dr. Miah gave me an introduction to the project and what's has been done so far. he walked me through the senior project presentation and documentation.

Thursday, May 09, 2019

We had a short meeting with Dakota and Eric and we discussed the prerequisites for the area coverage project and we agreed to meet again to go over the simulation and the implementation of the project.

I have to setup the following on my laptop:

- Ubuntu
- ROS Kinetic
- Putty
- Winscp
- VRep
- Matlab robotics toolbox (on the lab's pc)

Friday, May 10, 2019

I met Eric and Dakota in the robotics lab to transfer the project work.

They walked me through the basics of the project and a quick hadwaving on the simulation and physical implementation.

Dr. Miah wanted me to run at least on Demo on my laptop. However we figured out in order to do that i will need two machines one with ROS and other with matlab toolbox on it.

Wed, May 22, 2019

I met Dr. Miah Regarding the computer lab access and he sent to following email to Mr. Mattus the lab director:

Dear Chris,

Amr Elhussein is an ME graduate student and is currently working on a robotics project under my direction. He needs access to a computer in the robotics lab (JOB 254). I'd appreciate if you could please give him access to one of the computers in JOBST 254 as soon as possible. He needs to run some simulations immediately.

I know it's moving time but he will be out of the lab before moving starts.

Thanks,

The project documentation will be using Latex, and we also set the github account to put all the project material on.

We also set up a weekly presentation session to update the Robotics and mechatronics research group on the progress of the project.

The first two presentations will be :

- an introduction to ROS.
- Matlab Robotics toolbox.

Tue, May 28, 2019

We had a Skype meeting to discuss the content of my presentation. Dr. Miah reviewed the presentation and he pointed out some remarks which i edited immediately.

Fri, May 7, 2019

We had our first RAM group meeting, Caleb and Dylan gave a presentation on Mobile Robot Localization using Trilateration, Brian gave a presentation on BEMOSS and its enhanced applications and i gave the presentation on ROS.

tag=&ref=&adgrpid=71716366209&hvpone=&hvptwo=&hvadid=343187928718&hvpos=1o1&hvnetw=g&hvrnd=2299143640651648665&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=1016766&hvtargid=pla-523888688318

- Parrot Bebop: costs around 169.99
https://www.amazon.com/dp/B0000R9060/ref=dp_cr_wdg_tit_nw_mr
- Penn's AscTec Hummingbird Quadrotors

For DJI drones the only ones that are supported by ROS are quite expensive. so we either have to choose from the list or build our own drone.

Wed, Jun 5, 2019

I contacted Mathworks.com to get a free trial for matlab robotics system toolbox and i got it installed on ubuntu 16.04 along with ROS.

The next challenge was to figure out a way to connect matlab robotics toolbox and ROS connected on the same machine as all the tutorials on mathworks website talks about connecting Matlab and ROS on different machines.

Fri, Jun 7, 2019

We had our Robotics and Mechatronics Research Group (RAM) meeting in which Caleb presented a brief introduction on Multi robot localization using trilateration. Then I presented a brief introduction on Matlab Robotics Toolbox and its integration with ROS and the challenges that needs to be tackled.

Tue, June 11, 2019

I solved the problem of integrating Matlab Robotics Toolbox and ROS on the same machine. it appeared that you need to initialize ROS master in the terminal and then in matlab if you typed :

```
rosinit
```

it will connect to that existing ROS master node.

Thu, June 13, 2019

I followed turtlebot 3 tutorials on mathworks.com to verify the connection between Matlab and ROS.

Fri, June 14, 2019

We had our weekly meeting via Skype, we discussed my recent progress and we agreed on the next step which is implementing the three demos on my laptop.

We set our weekly meetings back to 3:00 pm if no presentation sessions are required.

in the Upcoming weeks I'll spend more time in the lab working with the actual robots.

Dr. Miah expressed his intent in writing a proposal grant to fund the project in which I'll be part of.

Dr. Miah asked me to check the pricing of the Matlab robotics toolbox for students which i discoverd later was around 100 USD including simulink.