Milestone 6

1. Project Name: IGVC - Intelligent Ground Vehicle Competition

2. Team members:

   - Viet Dung Nguyen (CSE) (dnguyen2016@my.fit.edu)
   - Jinwen Zhang (jzhang2015@my.fit.edu)
   - John Light (jlight2016@my.fit.edu)
   - Sijin Yang (yangs2017@my.fit.edu)
   - Peter Tarsoly (ptarsoly2016@my.fit.edu)

3. Faculty Sponsor: Dr. Marius Silaghi (msilaghi@fit.edu)

4. Client: Dr. Ken Gibbs

5. Meetings with the Client:

   - 03/27/2020
   - 04/03/2020
   - 04/10/2020
   - 04/17/2020

6. Date of meeting faculty sponsor:

   - 04/17/2020

1 Task matrix:

Task	Completion %	Viet Dung
Assist other member with simulation	100	100
Refactor the code	100	100
Add obstacles to the simulation	100	100

2 Task Discussion:

2.1 Assist other member with the simulation:

After examining the simulation with other members, the team found that the build script for the simulation require adjustments for different Linux distros.

Because the software was written using Python3 instead of Python2 with ROS 1, the default `catkin_make` command required the user to specify the location of Python3 installation, which are different between Linux distros.

2.2 Refactor the code:

After re-examining the code, the team made several improvement to the code quality, effectiveness, and structure.

The algorithm for mapping was improved. Previously, the software extracted the coordinates of the obstacles from the image first, then apply transformation algorithm on the list of coordinates before applying the information into the map. Now, the software first shrink and rotate the image first before extracting the obstacles coordinates. This method was more accurate.

The code are more modular. Image transformation functions was extracted to a different module. More object classes were used to separate the responsibility.

2.3 Adding obstacles:

A new Gazebo model for obstacle was created in order to test obstacle detection in the future

3 Contribution discussion:

- Viet Dung Nguyen

  - Redesign the map
  - Add obstacle models
  - Improve the Makefile
  - Improve the mapping algorithm

4 Lessons learned:

- Learn how to use ROS

  - Writing publisher, subscriber and custom ROS msg and service

- Learn how to use Gazebo for simulation:

  - Design models using specification document
  - Writing plugins for controlling robot

- Learn more about image filtering and mapping

5 Faculty Sponsor feedback on each task for the current milestone:

- Task 1

- Task 2

- Task 3

_____   _____
Signature   Date

6   Faculty Sponsor evaluation:

Viet Dung Nguyen   0   1   2   3   4   5   6   7   8   9   10

_____   _____
Signature   Date