# **Updated Gantt Chart of Project Schedule (11/11/15)**

|  |            |               |           |                       | Sep-15         | Oct-15        |           | Nov-15        |             | Jan-16    | Feb-16        |            | Mar-16         | Apr-1          |             |
|--|------------|---------------|-----------|-----------------------|----------------|---------------|-----------|---------------|-------------|-----------|---------------|------------|----------------|----------------|-------------|
| ID Activity  | Start      | Finish Hou    | urs       | Completion Percentage | 15 17 22 24 29 | 1 6 8 15 20 2 | 2 27 29 3 | 5 10 12 17 19 | 24 1 3 8 21 | 1 26 28 2 | 9 11 16 18 23 | 3 25 1 3 8 | 10 22 24 29 31 | 1 5 7 12 14 19 | 19 21 26 28 |
| 1 Read Manual for Interpretation of data packet from scanner       | 9/15/2015  | 9/17/2015     | 3.33      | 100%                  |                |               |           |               |             |           |               |            |                |                |             |
| 2 Research Image Registration Algorithms                           | 9/22/2015  | 9/24/2015     | 4.33      | 100%                  |                |               |           |               |             |           |               |            |                |                |             |
| 3 Purchase Camera  | 9/22/2015  | 10/1/2015     | N/A       | 100%                  |                |               |           |               |             |           |               |            |                |                |             |
| 4 Purchase Embedded Device   | 9/22/2015  | 10/8/2015     | N/A       | 100%                  |                |               |           |               |             |           |               |            |                |                |             |
| 5 Receive VLP-16   | 9/22/2015  | 10/15/2015    | N/A       | 100%                  |                |               |           |               |             |           |               |            |                |                |             |
| 6 Test Embedded Device   | 10/20/2015 | 10/20/2015    | 2.17      | 100%                  |                |               |           |               |             |           |               |            |                |                |             |
| 7 Test Power supply to camera                                      | 10/22/2015 | 10/27/2015    | 5.83      | 100%                  |                |               |           |               |             |           |               |            |                |                |             |
| 8 Implement Image Registration in MATLAB                           | 10/22/2015 | 10/29/2015    | 7.17      | 80%                   |                |               |           |               |             |           |               |            |                |                |             |
| 9 Implement Data Packet Read Function on Embedded Device           | 10/22/2015 | 11/10/2015    | 16        | 60%                   |                |               |           |               |             |           |               |            |                |                |             |
| 10 Test image Capture Capability of Camera                         | 10/29/2015 | 11/5/2015     | 7.17      | 100%                  |                |               |           |               |             |           |               |            |                |                |             |
| 11 Implement Image Registration on Embedded Device                 | 11/3/2015  | 11/23/2015    | 20.83     | 0%                    |                |               |           | ***           |             |           |               |            |                |                |             |
| 12 Camera Installation   | 11/10/2015 | 11/17/2015    | 7.67      | 100%                  |                |               |           |               |             |           |               |            |                |                |             |
| 13 Test Data Packet Read Function on Embedded Device               | 11/12/2015 | 11/19/2015    | 6.33      | 0%                    |                |               |           |               |             |           |               |            |                |                |             |
| 14 Interface via operating system                                  | 11/19/2015 | 12/1/2015     | 8         | 40%                   |                |               |           |               |             |           |               |            |                |                |             |
| 15 Test power supply to scanner                                    | 11/23/2015 | 12/1/2015     | 3.17      | 0%                    |                |               |           |               |             |           |               |            |                |                |             |
| 16 Implement Image Registration for Single Frame Input             | 12/1/2015  | 1/21/2016     | 11        | 0%                    |                |               |           |               |             |           |               |            |                |                |             |
| 17 Test Timing And Transmission of Data                            | 12/3/2015  | 1/21/2016     | 6.17      | 0%                    |                |               |           |               |             |           |               |            |                |                |             |
| 18 Test VLP-16 Scanner   | 12/3/2015  | 12/8/2015     | 3.17      | 0%                    |                |               |           |               |             |           |               |            |                |                |             |
| 19 Process Data Packet From Scanner                                | 1/21/2016  | 2/2/2016      | 11.33     | 0%                    |                |               |           |               |             |           |               |            |                |                |             |
| 20 Image Registration For Live Video                               | 1/26/2016  | 2/4/2016      | 11        | 0%                    |                |               |           |               |             |           |               |            |                |                |             |
| 21 Camera Data Packet Transmission                                 | 2/4/2016   | 2/16/2016     | 11.5      | 0%                    |                |               |           |               |             |           |               |            |                |                |             |
| 22 Orient/Install Scanner with appropriate scan angle (15 degrees) | 2/9/2016   | 2/16/2016     | 6.17      | 0%                    |                |               |           |               |             |           |               |            |                |                |             |
| 23 Progress Presentation   | 2/18/2016  | 2/18/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 24 Student Expo Abstract   | 3/10/2016  | 3/10/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 25 Test System Stability   | 3/22/2016  | 3/29/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 26 Project Demonstration   | 3/24/2016  | 3/24/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 27 Final Presentation (Last Lab Day)                               | 4/7/2016   | 4/7/2016 Del  | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 28 Student Expo Poster Printing Deadline                           | 4/7/2016   | 4/7/2016 Del  | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 29 Student Expo Poster Setup                                       | 4/12/2016  | 4/12/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 30 Student Expo  | 4/14/2016  | 4/14/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 31 Final Report (Draft)  | 4/14/2016  | 4/14/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 32 Final Report  | 4/28/2016  | 4/28/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 33 Final Web Page  | 4/28/2016  | 4/28/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 34 Advisory Board Poster Printing Deadline                         | 4/28/2016  | 4/28/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |
| 35 Advisory Board Poster Presentation                              | 4/28/2016  | 4/28/2016 Del | liverable | N/A                   |                |               |           |               |             |           |               |            |                |                |             |

## **Progress Update (11/11/15)**

### Juan Vazquez

I have begun interfacing the laser scanner (Velodyne Puck) with the embedded device (Odroid-XU4). I've implemented and altered program functionality to receive incoming raw Ethernet data from the laser scanner using User Datagram Protocol (UDP). Further development will involve storing this data and researching other methods.

#### **David Bumpus**

Through research and MATLAB simulations, I have successfully determined the registration method which will be implemented on the embedded device. I have tested the feature detection capabilities of the SIFT method. I will add some algorithms to this method to register lidar and image data. I am slightly behind schedule. In order to be back on schedule, I will test feature mapping and registration of the data in MATLAB between the two data sets.

#### Daniel Kubik

This week I began to create my classes in C++. I have successfully created and tested half of the classes and plan to create the other half next. While I am running slightly behind schedule, I will put in more time after lab to complete these. I am not too worried however as progress is going well.