Señor Robot

A Robotic Courier System

Progress Report Wk3

Alex Crawford
Andrew LeCain
Russell Martin
Ryan Cramer

4/3/12

Milestone chart

Task	Scheduled Completion	Team Member	Modified Completion Date	Comments
Chassis prototype construction	1/1	Andrew	Completed	
USB motor control	3/3	Alex	3/17	Completed
Teleoperation of vehicle	3/10	Andrew, Alex	3/19	Completed
Auxiliary sensor installation and configuration	3/17	Alex	?	Waiting on sensors
Power supply/charging system	3/17	Andrew	3/22	Completed, but will need to be rehashed when mechanical system is done.
Mapping Framework Completed	3/24	Andrew	3/22	Completed. Still needing calibration
Wireless Data Acquisition & Estimation	3/31	Russ	Completed	
Mechanical Completion	3/31	Alex	4/5	
Electrical Completion	3/31	Andrew	4/4	Need to add charging tether and route USB
Navigation Framework Completed	3/31	Andrew	4/7	Rough navigation works, but without calibration the robot doesn't realize it is at the destination. Calibration delayed due to mechanical rebuild
User Interface Design Completed	4/7	Ryan		

Wireless Data Acquisition on Vehicle	4/15	Russ		
Wireless Location Integration	4/22	Russ, Andrew		
User Interface Communicating With Vehicle	4/22	Ryan		
Completed Assembly & Integration Testing	4/29	All		
Completed Project & Testing	5/1	All		

Current Milestones:

Auxiliary sensor installation and configuration	3/17	Alex		Waiting on sensors
Mechanical Completion	3/31	Alex	4/4	Rebuild mostly complete. Still need to mount mouse and switch panel
Power supply/charging system	3/17	Andrew	4/4	Complete. Needs to be rewired for the rebuilt chassis
Mapping Framework	3/24	Andrew	3/22	Complete. Waiting on integration
Wireless Trilateration Completion	3/31	Russ	Comple ted	Completed with Unit Tests 3/30

Next Milestones:

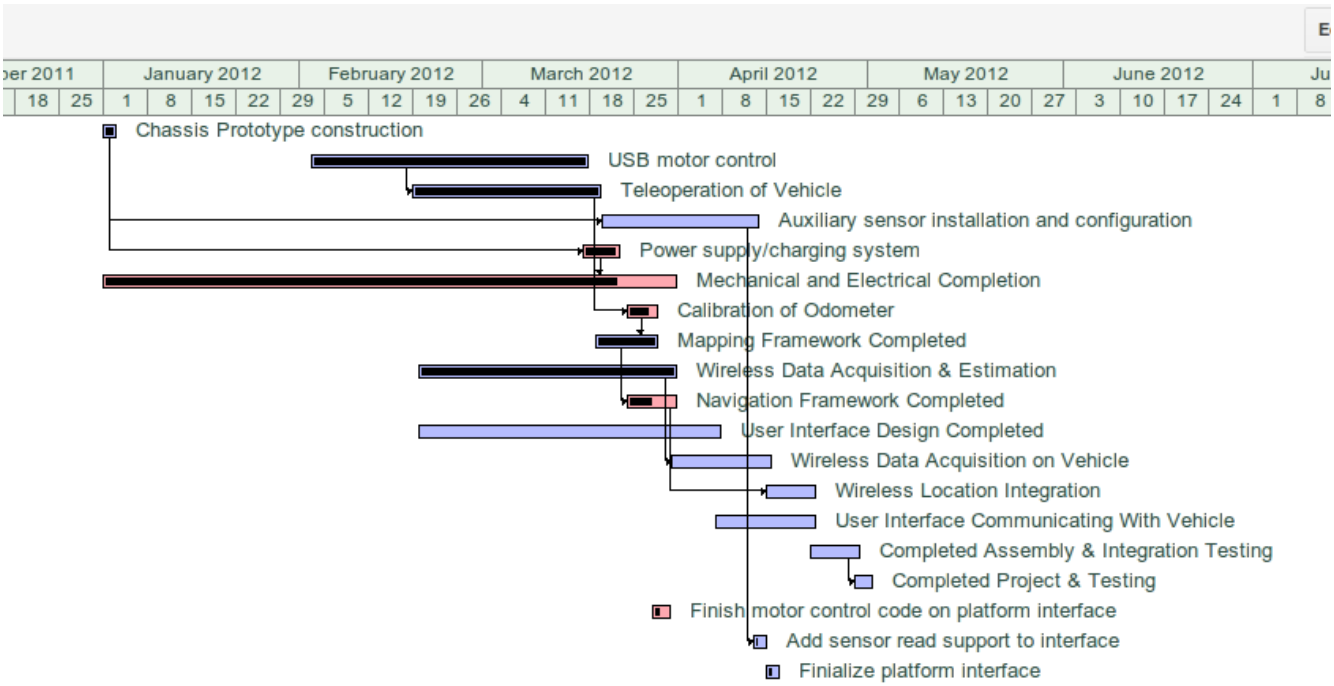
User Interface Design Completed	4/7	Ryan		
Navigation subsystem	3/31	Andrew		Framework Complete. Need to calibrate for best routing plan. Delayed due to mechanical rebuild.

Status:

The wireless subsystem was completed this week, with all unit tests passing within one meter accuracy of the exact location of the access point, which was a much lower error than expected for the subsystem. With this completion, integration work can begin in incorporating the subsystem to the robot. The first step involves using the ROS Transforms in order to get the robot's position and offset to the wireless card. Once this is done, the robot should be able to move around and use the location it provides to measure the location of the access points, instead of manually taking data that was generated by hand due to no location being able to be provided in the subsystem. Following this integration, all of the unit tests will need to be run again, using teleoperative control of the vehicle, to ensure that the accuracy is still maintained. Additionally, the external wireless card should arrive this week, which will allow more accurate measurements of the access points, instead of depending on the orientation of the laptop previously measuring the signal strengths. However, once this card arrives, the calibration and unit tests will need to be run again on the subsystem, in order to ensure that the functionality and accuracy are not hindered by the new antenna.

A minor issue came up while testing the navigation framework. Maps ended up taking more system memory than expected, so we've ordered additional RAM sticks for the control laptop. This shouldn't be an issue as it will get here shortly, and small maps work fine for now. Local navigation on a small map is currently working, but the routing plan is not yet configured for the platform and the odometry isn't calibrated, so the platform circles around its goal without realizing it has reached it.

Gantt Chart:


January 2012
February 2012
March 2012
April 2012
May 2012
June 2012
18 25 1 8 15 22 29 5 12 19 26 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 1 8
Chassis Prototype construction
USB motor control
Teleoperation of Vehicle
Auxiliary sensor installation and configuration
Power supply/charging system
Mechanical and Electrical Completion
Calibration of Odometer
Mapping Framework Completed
Wireless Data Acquisition & Estimation
Navigation Framework Completed
User Interface Design Completed
Wireless Data Acquisition on Vehicle
Wireless Location Integration
User Interface Communicating With Vehicle
Completed Assembly & Integration Testing
Completed Project & Testing
Finish motor control code on platform interface
Add sensor read support to interface
Finialize platform interface