Extraterrestrial Robot Explorer and Environmental Logger

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PROJECT SCHEDULE

Last updated: October 13, 2016

Week Ending	Phase	Primary Task		Subtasks	Assigned	Status
07-Oct-16	Planning	***A***	Finalize Specification for proof of concept (This task will be completed throughout the duration of the project)	1. Clarify the contents/scope of this specification. What does *this specific specification* require? (i.e., Audience, purpose, level of detail, technical vs functional)	*All*	On Schedule
				2. Complete the specification.	*All*	On Schedule
				3. Submit to group members for final revisions and editing.	*All*	On Schedule
		B	Finalize selection of sensors and start technical reports on assigned sensors	*Pending…*	*All*	On Schedule
		C	Familiarize group with Raspberry Pi development environment	1. Boot up the Raspberry Pi and spend an hour exploring the environment.	*Ovi*	Completed
				2. Write some test code. Something that may be useful to the project eventually would be nice (ex., USB or Wi-Fi device initialization)	*Ovi*	Completed
				3. Give a tour of the OS to the other group members. Explain the example code functionality.	*Ovi*	Completed
		D	Get encoders working	1. Resurrect required resources from last semester and create a new project for testing the encoder software independently of the project.	*All*	Completed
				2. Write code that counts encoder veins while the wheels are spinning	*All*	Completed
				3. Write code that uses the counted encoder veins to determine speed and position of robot	*All*	Delayed

				4. Integrate the independently validated encoder control software with the project code.	*All*	Delayed
				5. Test that functionality of the encoders is still correct *and that no other functionality has been impaired by the integration.*	*All*	Delayed
		E	Choose the Supervisory control method	1. Experiment with the console in the Linux environment. Create code to gauge the level of complexity of tracking of keystrokes, including keys held and released, and any associated delays.	*Kevin*	Completed
				2. Create a list of pros/cons for each of the methods available (Joystick, Scripts or Keyboard).	*Kevin*	Completed
				3. Present findings to the group and make a final decision on the control method.	*Kevin*	Completed
		F	Finish COTS selection matrix	1. Gather power requirements of the Linux box (i.e., must power the camera, etc)	*James*	Completed
				2. Finalize document, including any last requirements (power requirements from above) and associated analysis of possible solutions.	*James*	Completed
				3. Present findings to the group and purchase/secure the selected COTS Linux box.	*James*	Completed
14-Oct-16	Design	***A***	Get PID control working on the robot platform	1. Ensure encoders working with engineering units	*All*	Delayed
				2. Determine method of importing PID control into the system (writing code manually, using SimuLink)	*All*	Delayed
				3. Test and adjust PID control on the robot in an individual project.	*All*	Delayed
				4. Integrate with the main project code.	*All*	Delayed
		B	Prepare Raspberry Pi for Wi-Fi connection	1. Get Raspbian OS onto the raspberry Pi	*Ovi*	Completed
				2. Install Eclipse and C/C++ extension	*Ovi*	Completed

				3. Start working on communications between Pi and Laptop over Wi-Fi link	*Ovi*	Completed
		C	Begin adjusting supervisory Linux program to work with the selected control method (i.e., Joystick…)	1. Prepare a new communication protocol based on the selected control method.	*Kevin*	Completed
				2. Implement the new communication protocol into the existing program.	*Kevin*	Completed
		D	Initialize RS-232 on the Pi and get communication between it and the platform controller working.	1. Identify the name of the device (i.e. */dev/tty___*), using the USB-DB9 converter.	*James*	Completed
				2. Decide on one of two options: (a) write a new program to communicate with the port, or (b) try to recycle the Linux Supervisor port communication code to work on the Pi.	*James*	Completed
				3. (a) Simulate communication using real term. (b) Communicate between the Pi and the Axman.	*James*	Delayed
				4. Integrate with the platform controller: ensure reliable communications between the modules.	*James*	Delayed
		E	Investigate the need for threading in the supervisory Linux program	1. Create a pros/cons list of threading vs single thread program. Is the response of the system significantly affected if we only use a single thread?	*Kevin*	Completed
				2. If threading is deemed favourable or necessary, begin implementing threading. Ask Peter for a re-cap (or go back to old notes) on the common pitfalls and mistakes made when threading they can be avoided.	*Kevin*	Completed
21-Oct-16	Design	***A***	Establish a reliable communication link between the Supervisory control program and the Raspberry Pi	1. Raspberry Pi running Raspbian		On Schedule
				2. Load test code onto the pi using the micro SD card		On Schedule

			over Wi-Fi.	3. Connect host computer to local area network via router provided by Peter + Bill	*Ovi and Kevin*	On Schedule
				4. Using socket communication send and echo back a single char		On Schedule
				5. Send and echo back strings		On Schedule
		B	Finalize code for the selected control method in the supervisory control program. Implement threading if you have chosen to do so.	1. Integrate Encoders into project supervisor	*Kevin*	On Schedule
				2. Integrate PID control		On Schedule
				3. Intergrate Joystick/ArrowKey control …… Create thread		On Schedule
				4. Test and verify functionality		On Schedule
		C	Integrate any environmental sensors onto the board, if you have decided to do so for bonus marks.	1. Pick desired sensors to add	*All*	On Schedule
				2. Create protoboard/PCB for signal conditioning circuit		On Schedule
				3. Mount enironmental sensors to the robot		On Schedule
				4. Test and verify functionality of sensors		On Schedule
		D	Finalize RS-232 communication between Raspberry Pi and the platform controller	1. Ensure that communications are reliable and quick.	*James*	On Schedule
				2. Ready for integration next week?		
		E	Catch up delayed primary tasks for last previous weeks:	1. RS-232 Communication (Pi -> Platform)	*James*	Delayed
				2. Get Encoders finished and integrated	*All*	Critical
				2. Start PID Control	*All*	Critical
28-Oct-16	Final Integration and Testing	***A***	Integrate the major system modules: *Supervisor, Linux Box, and Platform Controller* . Establish and confirm reliable communication between all modules.			Pending

		B	Write code to incorporate any environmental sensor functionality in both the Supervisor and the Platform, if any are mounted to the board.			Pending
		C	PID Control	1. Ensure encoders working with engineering units	*All*	Delayed
				2. Determine method of importing PID control into the system (writing code manually, using SimuLink)	*All*	Delayed
				3. Test and adjust PID control on the robot in an individual project.	*All*	Delayed
				4. Integrate with the main project code.	*All*	Delayed
04-Nov-16	Final Integration and Testing	***A***	Verify and validate complete system functionality.			Pending
		B	Complete any missed or overdue tasks.			Pending