

Remote controlled indoor cart using mobile application Progress Report 1

Overview of Progress

Accomplishments: design of communication protocol. The protocol is as follow:

Server Messages

Message	Parameter	Meaning
move	- F (forward) or B (backward) - distance in cm	sets the car in motion either forward or backward the given cms. If cms = 0 it moves until a stop command is received or detects obstacle
stop	no parameters	stops the cart immediately
turn	- L (left) or R (right) - degree 0-90	turns the wheels to the given direction at the given degree angle
get-status	- S (sonar) or L (light sensor)	the response depends on the data produced by each device. In the case of the sonar, the response is the distance to the nearest object. In the case of light, the intensity of the light. We will enhance these once we know what data we can get from the sensors.

Cart Messages

Message	Parameter	Meaning
response	- status - reason	status is the name of the message the cart is responding to. For example, in the case of a stop message, the cart will send a response message like "response:stopped:stop message received"
event	- description	This is the only message that the cart can produce by itself. It gets trigger if some event occurs, for instance if the car finds an obstacle and it stopped. Another use for this message is to report failures such as battery low or hardware malfunction. An example of a type of event message is "event:stopped:obstacle:distance"

Design of user interfaces for mobile application.

Challenges: the main challenge for this stage of the project was to design a robust and yet flexible communication protocol between the server and the cart. Our current design is a high level design which will likely change once we interact with the actual physical components, i.e., the cart, sonar and light sensors. Until we know more about the actual functioning of these devices, such as what type of data produced by them, our design will have to remain high level.

Barriers to Success: there were virtually no barriers to success other than a long Spring break in which little progress was made.

Profile

Progress per Objective

Category	Design Objective	Deliverable	Status
Power	Battery Availability	Using AA batteries	0%
Communication	Wireless communication	Wifi nordic	0%
Control Protocol	Control the cart	Design of control and data messages	100%
Control Protocol	Control the cart	Design two state machines, one for cart and for control app.	25%
Cart	Safe halting	Sonar	0%
Cart	Ambient reading	Light sensor	0%
User Interface	Mobile control	Mobile Application for Android. Includes a halt message.	25%
User Interface	Server control	Terminal application	0%
User Interface	Ambient reading	Light readings	0%

Milestones

Software

- Mobile Application - 25%
- Server Application - 0%
- Design Communication Protocol - 100%
- Implement Communication Protocol - 25%
- Cart Control Algorithm (movements, safe halting) - 0%

Hardware

- Board Prototyping - 0%
- Board Design - 0%
- Order Components - 0%
- Integration - 0%
- Testing and Debugging - on going process - 0%

On our original milestone, the board design/prototyping was set to be done this week. This is unlikely to occur at this point. However, with Bryce's support as announced today in class, we will likely be finish with the board design the next week having little or no impact on the overall project. Also, the mobile and server application will likely move the overall timeline a few days but this is fine since we had some slack built into the original timeline to account for this delay caused mainly by Spring Break. Overall, we are still on track.