Project Schedule and Cost

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INTRODUCTION:

After we finished the ideation of several conceptual designs, we are moving to the stage of prototyping and testing. However, our group needs to come up with a project schedule and plan that enable the team to stay focus and keep on track for making three prototype and testing each of them to seek for improvements. In this deliverable, we will present a list of our project tasks, for now to the end of the semester, that includes duration and responsible person for individual task in order to finish three prototypes effectively and punctually. Furthermore, we will also determine and present the estimate cost for materials, and critical risks with contingence plans to mitigate these risks for our project.

LIST OF TASKS NEEDS TO BE COMPLETE & SCHEDULE:

- **LIST OF TASKS:**

Task ID	Task Description	Estimated Duration (days)	Owner	Depends on task ID:
1	Project schedule	2	Guo	-
2	Gantt chart for schedule	2	Chen	2
3	Cost estimate	2	Meneses	-
4	Significant risks and contingency plans	2	Paul, Musetti	-
5	**Project Schedule and Cost completed**	0	All	1,2,3,4
6	Getting Customer feedback for conceptual design	1	All	-
7	Analysis of customer feedback	1	Paul, Musetti	6
8	Device testing plans	2	Guo, Chen, Meneses	6
9	Prototype I development	5	All	5
10	Analysis of critical components or systems	2	Guo, Meneses	9
11	**Prototype I Completed**	0	All	9,10
12	Deliverable- Prototype I and Customer Feedback	2	All	6~10
13	Preparation for Client meeting II	2	All	-
14	Analysis the information from client meeting	1	Paul, Musetti	13
15	Improvements discussion	2	Chen, Meneses	11,14
16	Prototype II development	7	All	11
17	Analytical, numerical model	2	Paul, Guo	16

Task ID	Task Description	Estimated Duration (days)	Owner	Depends on task ID:
18	Execute testing plan for prototype II	2	Guo, Chen,	8,16
19	Prototype II subsystem Refinement	2	All	14~18
20	**Prototype II Completed**	0	All	11
21	Deliverable- Prototype II and Customer Feedback	2	All	13~19
22	Getting customer feedback	1	All	20
23	Perform analysis of feedback	1	Paul, Musetti	22
24	Analysis results of testing for improvements	2	Guo, Meneses, Zhen	18, 23
25	Prototype III development	9	All	20
26	Perform testing	2	Guo, Meneses	8, 24
27	Prototype III Refinement	2	All	23,24,25
28	**Prototype III Completed**	0	All	20
29	Deliverable- Prototype III and Customer Feedback	2	All	22~27
30	Team presentation preparation	5	All	28
31	Final Project Presentations	1	All	11, 20, 28
32	Design day Prototype and Presentation	1	All	28
33	Final Project Report	7	All	-

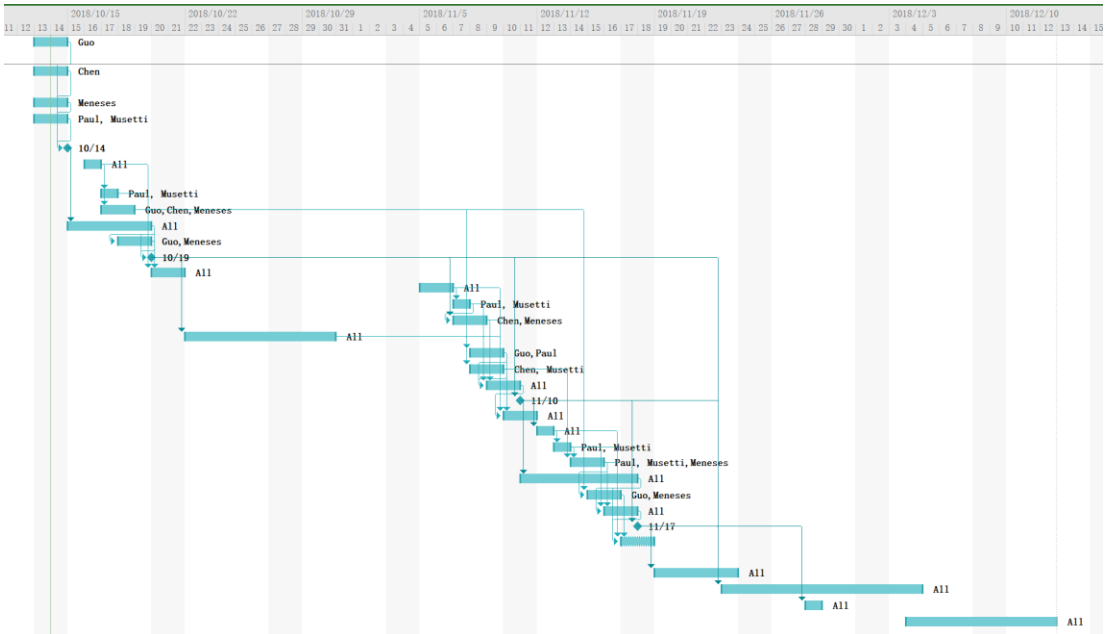
- Project Schedule:

Tasks ID	Duration Date
1	Sat, October 13, 2018 ~ Sun, October 14, 2018
2	Sat, October 13, 2018 ~ Sun, October 14, 2018
3	Sat, October 13, 2018 ~ Sun, October 14, 2018
4	Sat, October 13, 2018 ~ Sun, October 14, 2018
5	**Sun, October 14, 2018**
6	Tue, October 16, 2018 ~ Tue, October 16, 2018
7	Wen, October 17, 2018 ~ Wen, October 17, 2018
8	Wen, October 17, 2018 ~ Thu, October 18, 2018
9	Mon October 15, 2018 ~ Fri, October 19, 2018
10	Thu, October 18, 2018 ~ Fri, October 19, 2018
11	**Fri, October 19, 2018**
12	Sat, October 20, 2018 ~ Sun, October 21, 2018
13	Mon, November 5, 2018~ Thu, November 6, 2018
14	Wen, November 7, 2018 ~ Wen, November 7, 2018
15	Wen, November 7, 2018 ~ Wen, November 8, 2018

Tasks ID	Duration Date
16	Mon, Sun, October 22, 2018 ~ Sun, Sun, October 28, 2018
17	Wen, November 8, 2018 ~ Thu, November9, 2018
18	Wen, November 8, 2018 ~ Thu, November9, 2018
19	Thu, November9, 2018 ~ Fir November 10, 2018
20	**Fir November 10, 2018**
21	Sat, November10, 2018 ~ Sun November 11, 2018
22	Mon, November12, 2018 ~ Mon, November12, 2018
23	Mon, November12, 2018 ~ Mon, November12, 2018
24	Mon, November12, 2018 ~ Thu, November13, 2018
25	Thu, November 11, 2018 ~Sat, November17, 2018
26	Thu, November 15, 2018 ~ Fir, November 16, 2018
27	Fir, November 16, 2018 ~ Sat, November17, 2018
28	**Sat, November17, 2018**
29	Sat, November17, 2018 ~ Sun, November 18, 2018
30	Mon, November 19, 2018 ~ Fri, November 23, 2018
31	Fri, November 23, 2018 ~ Tue, December 4, 2018
32	Wen, November 28, 2018 ~ Wen, November 28, 2018
33	Tue, December 4, 2018 ~ Tue, December 11, 2018

Note: For the tasks after prototype one, we did not receive the explicated instruction for each deliverable, so these tasks are based on our on discussed plans. Therefore, the tasks and its duration may change slightly depend on the specific instructions. Furthermore, the duration of final report may change because we do not know the date of exam yet, as well as any other tasks. ***In addition, some members may involve in more than one task during same duration for the purposes of getting their suggestions and ideas to make the tasks better. However, they will not do the main task, but involved.***

GANTT DIAGRAM:



DESIGN: PROTOTYPING OBJECTIVES:

Our main objectives for prototypes are to physically interpret our solutions to client, with the purposes of communicate ideas, ensure fidelity, reducing the risks and uncertainties of the solution, and measure the performance of our solution. In order to achieve these, we will form three different fidelity levels, low, medium, and high, prototypes.

1) Low fidelity prototype (Prototype I):
   We will use limited resource to made a model of our solution that works as a basic proof for our concepts with simply analysis of significant components and systems to explore different ideas.
2) Medium fidelity prototype (Prototype II):
   In this stage, we will focus on the subsystem of our solution in order to ensure our final solution works. Thus, our prototype will involve more details of the solution but with some limited functionality. An analytical, numerical or experimental model will include that help us to gain better senses and approximation of final prototype to refine the solution.
3) High fidelity prototype (Prototype III):
   This is our final stage of prototype that will very close to our final design, which may be our final product. This prototype is fully functional that have expected features and functionality, that help us to analyze the whole functionality with experience purposes also to ensure the satisfaction of client's needs.

SIGNIFICANT PROJECT RISKS & CONTINGENCY PLANS:

Throughout the process of the prototype building, risks are bound to be experienced. A significant risk that pertains to our prototype is that the sensors may not be water proof (weatherproof). Another risk that comes about using sensors for our prototype is the positioning of the wires on the actual robot. The problems that occur with the first risk is that the sensor may not work accordingly to plan due to being in contact with water or anything that comes with unfortunate weather circumstances. This means that the robot may not brake when intended to, which could lead to an even bigger problem, such as crashing into objects because it cannot sense them anymore. A possible idea that will be taken into consideration to create a solution to this risk/problem is using plastic wrap on the sensors. Plastic wrap can be condensed by putting a hot glue gun over it, and it will shrink up and create a strong protection against weather precipitation. The problem with the second risk is that the wires can interrupt the functionality of the actual robot and stop it from performing basic tasks or even spark dangerous effects (flame, shocks, etc.). A way of avoiding such risks are organizing the wires properly and using zip-ties to keep all the wires together in one place and to choose in optimal route for them to follow so that they will not interfere with other wires.

ESTIMATE OF THE COST:

Name	Source	Cost
3D Printer Filament (1kg spool)	Amazon	$22.99 CAD
Distance Sensor (5pcs)	Amazon	$12.54 CAD
Arduino Kit	Amazon	$39.99 CAD
Other necessary materials	TBD	≈ $5.00 CAD

Total	-	$80.52 CAD
After Tax	-	≈ $90.99 CAD

- Explanation of the material:

1) 3D Printer Filament – This will be used to make our model (small remote-control car), to demonstrate how our sensor works.
2) Distance Sensor – This is the main component of our project, for improve braking system.
3) Arduino Kit – This will be used to control and to connect all the sensors that we need for our model, which could connect to the mother board of Bowie.
4) Other necessary materials – Samples of this are the screws, markers or tapes that we will need.

ANALYSIS: FEEDBACK, TEST PLAN, MEETING PREPARATION:

Our team has not met with our client to communication our conceptual designs and get the feedback yet, so we cannot identify the interesting and useful information from the feedback to improve our design. However, we will briefly discuss how will we use the feedback to improve our solution, prepare the prototyping test plan, and prepare for client meeting.

Firstly, we will present and explain our selected conceptual design to client to seek for any improvements and suggestions. Secondly, based on the feedback, we will refine our solutions to maximum the satisfaction of client's needs. Thirdly, summarize the intonations of client about the solution as well as the expectations to selected most situatable test plan and methods to keep our solution and prototype on track. Finally, present our refinements, prototype, testing plan, and any uncertainties during these processes in the next client meeting with the purposes of improving and moving to next stage.

LIFE-LONG LEARNING: TRANSFER OF KNOWLEDGE

During the last deliverable, our group came up three global conceptual design, and selected one of the most suitable design by performing analysis and eluviation based on our design criteria and specification. Now, we are moving from the ideation stage to the stages prototyping and testing. However, before we start, our team required to form a project schedule and plan in order to ensure our team keep one track and finish rest of work effectively and punctually. Thus, we formed a Gantt diagram according to the knowledge from both lab sections and lecture, which works as a schedule form now to the end of the semester. In the next step, we will get the feedback from client, made our prototype I, and device our testing plan. In order to ensure these three processes to finish effectively, we will apply the knowledge of receive feedbacks, what makes good prototype, and test planning steps from lecture 11.

COLCLUSION:

Since our team have already form the task list and Gantt chart for the project, we will follow this schedule to develop our three prototypes step by step. During the development of prototypes, we will pay attenuation to our hypothesis critical risks as mentioned above and revise our contingency plans continuously to minimize the impact of risk. Furthermore, we will follow our three levels fidelity plan to ensure us to achieve project objectives. Finally, our solution, prototypes, and testing plan will be refined and revised each time after we received the feedback from client to maximum the satisfaction of their needs.