



Race of Doom

Team 8

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Project Overview

- *Creating an autonomous vehicle that can receive data from each group to allow for a "race"*
- *Get through different, real-world obstacles successfully*
- Obstacles include
 - People crossing the street
 - Stop signs
 - Bad guys popping up that need to be shot
 - Construction
 - Walls

Project Management Style

Gathering components and using previous examples to begin making a prototype



Implementing Hardware via Breadboard and Microcontrollers to create a programmable base model



Implementing code functionality to allow for obstacle detection and movement of the vehicle



Assembling obstacles and a course to run trials. These will test for accuracy of detection and maneuverability

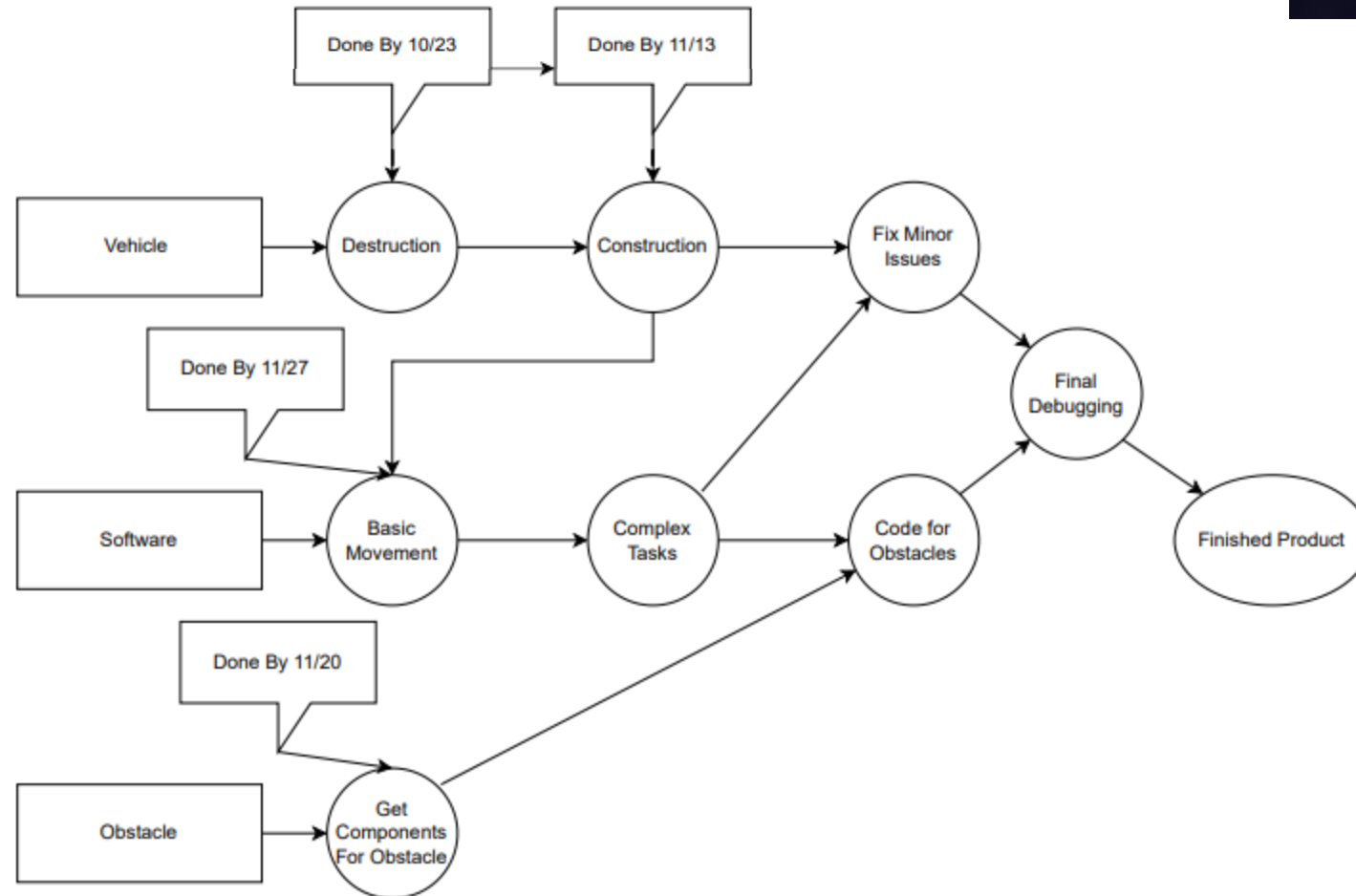


From Trial observation specific tweaks can be made to the software and hardware

Task Decomposition

| PROJECT: Race Of Doom | | | | | |
|---|-----------|-------------|--|------------|------|
| <div>Iowa State University</div> <div>sdmay25-08</div> <div>Project start date: 9/12/2024</div> <div>Scrolling increment: 0</div> | | | Legend: <div>On trackLow riskMed riskHigh riskUnassigned</div> | | |
| Milestone description | Category | Assigned to | Progress | Start | Days |
| Vehicle | | | | | |
| Find Car | Goal | Name | 100% | 9/12/2024 | 3 |
| Find Sensors + Processor | Goal | | 75% | 9/12/2024 | 1 |
| Figure Out Current Pins | Low Risk | | 50% | 10/10/2024 | 10 |
| Deconstruct | Milestone | | 20% | 10/17/2024 | 10 |
| Construct Car | Milestone | | 10% | 10/27/2024 | 20 |
| Mount Sensors | Goal | | 10% | 10/27/2024 | 10 |
| Map Pins | Goal | | 10% | 11/6/2024 | 10 |
| Code | | | | | |
| Find Last Sem Code | Low Risk | Team | 100% | 9/12/2024 | 13 |
| Connect to Raspberry Pi | Milestone | Team - Alex | 30% | 10/27/2024 | 10 |
| Basic Commands | High Risk | Team - Alex | 0% | 11/11/2024 | 25 |
| Challenge Along the way | High Risk | Team | | | |
| Challenge Along the way | Low Risk | Team | | | |
| Course | | | | | |
| Obstacle Design | Med Risk | Team | 10% | 11/13/2024 | 14 |
| Obstacle Assembly | Med Risk | Alex | 0% | 11/27/2024 | 14 |
| Course Layout | Low Risk | Alex | 0% | 12/12/2024 | 6 |
| TITLE 4 | | | | | |
| Task 1 | | | | 1/3/1900 | 15 |
| Task 2 | | | | 1/17/1900 | 5 |
| Task 3 | Milestone | | | 2/28/1900 | 1 |
| Task 4 | | | | | |

Measurables



Key Milestones

Milestone 1:

- Gather components and Implement our hardware onto the car we have been provided*

Milestone 2:

- Work on establishing basic movement for the vehicle*

Milestone 3:

- Test the connectivity of the sensors and observe feedback from them to prepare for obstacle detection*

Milestone 4:

- Developing a course to perform "Test Runs" which will allow us to tweak and redesign our model*

Key Risks and how to avoid them

- *Since our vehicle is a small scale model of a real world autonomous vehicle, obstacles are a risk, failed maneuverability can lead to user concern*
- *Risk realization is high since we are using several sensor types to detect and prevent collisions*
- *Some consequences of collisions would be failing the large scale scope of the project which is user safety*
- *Using different sensors as mentioned and performing trials can mitigate these concerns*

Conclusions

- *A prototype is to be assembled first through hardware and then through software implementation*
- *Obstacles will be developed along with a track to test our vehicles detection and maneuverability*
- *Trial and error through test runs will be our primary source of data gathering and allow us to adapt our vehicle for more positive results*

Thank You!