**Antweight Battlebot Final Demo**

**Team 37**

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Fall 2024

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## **High-Level Requirements List**

1. The total weight of the battle bot, including components such as the chassis, electronics, and weaponry, must not exceed 2 lbs.
2. The Wi-Fi communication range indoors should be between 30 to 100 meters with the battle bot’s response time being 50 to 100 milliseconds.
3. The battle bot must be able to destabilize or flip an opponent battle bot weighing about 2lbs.

## **Block Diagram**

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## **Requirements and Verification**

### **DriveTrain Subsystem**

| **Requirements** | **Verification** |
| --- | --- |
| The motors and motor drivers must operate efficiently with a 9V. | Measure the voltage supplied to the motors. Verify that the voltage is between 7.5 - 9V range during operation. |
| The wheels must enable the robot to move at a sufficient speed, achieving an RPM of approximately **100 - 460** . | Manually measure RPM by counting the number of wheel rotations in a fixed period of 10 seconds and multiply by 6 to get the RPM. Ensure the measured RPM falls between 100 - 460 for effective mobility. |

### **Defense Subsystem**

| **Requirements** | **Verification** |
| --- | --- |
| Flipping Force: The should generate enough force to flip the opponent robot. | Place a weight equivalent to the opponent robot on one side of the battle bot. Make the battle bot run into the opponent and see if it gets destabilized or flipped. |

### **Power Subsystem**

| **Requirements** | **Verification** |
| --- | --- |
| The subsystem must include a 9V battery to power the bot for about 3-5 minutes which is what we expect the duration of the battle to be. | Test the battlebot 3-5 times by keeping the power on and making the bot run around for the duration of the time and make sure it doesn’t power down. |

### **Control Subsystem**

| **Requirements** | **Verification** |
| --- | --- |
| The latency should be between 50 - 100 ms for responsive control. | Measure the time between a button being pressed and the command being relayed. Test multiple times with multiple commands to get average latency across operation. |
| The battlebot should stop operating if WIFI connection is lost as a safety precaution (kill switch) | Turn off wifi, and observe if the battle bot stops operating |
| The battlebot should be able to receive commands and execute them up to a distance of 8.48ft | Put the battlebot at incremental distances up to 10ft from the PC and check the operational condition. |