Deebot Disassembly

By: Kiran and Abhiram

Team number: 73888A

Location of team: Cypress Bay High School, Weston, FL

Parts List:

- Main brush
- Wheels with motor
- Motors
- Main Motherboard
- Wifi Connector
- Wires
- Screws and washers
- Cliff Sensors
- Bumper sensor
- Top plastic part of the robot
- Sweepers
- Motors for sweepers
- On/Off switch
- Trash compartment
- Vacuum module
- Base of robot
- Battery
- Filter



Top view of deebot before disassembly

Bottom view of deebot

Intro: We used a Deebot, which is an automatic vacuum robot. We chose this electronic device because it was broken, seemed interesting because of all the sensors, and we couldn't let an expensive device just go to waste.



After disassembly



Main brush: Spins and picks up all the dirt into the vacuum module.

Wheels with Motors: Ensures the wheels can spin to provide mobility.





Motor: Ensures that the main brush can spin by taking power from the battery.



Main Motherboard: It's the main control system that ties the robot's components together to perform the task of vacuuming.

Wifi Connector: The WiFi connector gives the robot a connection to an available network, which enables the robot to connect either to the remote control, Google Home, or Alexa.





Power connector wires: These wires connect the components of the robot to the motherboard, which gives the components information and powers the components.

Screws and Washers: Keeps everything together.





Cliff Sensors: Cliff sensors are used in this robot to sense if there is a "cliff" (stairs or a balcony) and can make the decision to turn to avoid falling off the cliff by backing up and turning.

Top cap of the robot: Protects the wiring underneath the top cap from getting damaged. Has on/off switch to stop or start the robot.





Bumper Sensor: The bumper sensor senses when it hits a wall so that it can take action to either turn the robot or stop it.

Sweepers: Spins and pushes the dirt towards the main brush and towards the vacuum module.





Motors for sweepers: Spin the sweepers and ensure that sweepers can push the dirt into the vacuum module. **On/Off Switch:** Turns the robot on and off.





Trash compartment: Area to store the trash that the robot picks up.

Vacuum module: Provides a vacuum, which sucks up dirt, and a tube that leads to the trash compartment.





Base of robot: Provides a foundation for the rest of the components.

Battery: Provides a power supply to the robot.





Filter: Filters out the big and the small dirt.

What we learned:

From taking apart the deebot we learned about the various electrical components that allow the vacuum robot to function including sensors, motors, and the motherboard. We learned that the robot had a cliff sensor and a bumper sensor. Each sensor filled its own purpose listed above. The motors were an essential part of the machine; there were 5 different motors (one for the main brush, 2 for the sweepers, and 2 for the wheels) and since these sensors were used in many parts of the robot it shows how important it was. Additionally, once we opened up the top of the robot we found the motherboard with countless wires that all served a different purpose with intricate placement showing how meticulously the motherboard has to be assembled with its connections so the robot can function. Finally, we learned that even things that may go to waste can teach us valuable lessons.

Bibliography:

- "WIFI Module ESP8266 (4MB Flash)." WRL-17146 SparkFun Electronics, https://www.sparkfun.com/products/17146#:~:text=The%20ESP8266%20WiFi%20Modul e%20is,functions%20from%20another%20application%20processor.
- Knerl, Linsey. "What Does a Motherboard Do: HP® Tech Takes." What Does a Motherboard Do | HP® Tech Takes, HP, 18 Oct. 2019, https://www.hp.com/us-en/shop/tech-takes/what-does-a-motherboard-do#:~:text=The%2 Omotherboard%20is%20the%20backbone,a%20computer%20to%20work%20well.
- How Does a Roomba Work? (Animation) | the Zebra.
 https://www.thezebra.com/resources/home/how-roomba-works/.