Team Name: sdmay24-27
Team Members:

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Report Period: Sept 11-Sept 24

Summary of Progress in this Period

A decision was reached, and we purchased a preliminary set of haptic feedback motors. The motors we chose meet all our requirements, but in-person testing has been done and will continue to ensure no variability. A Raspberry Pi was rented from the library as a demo computing device to test the motors. We were able to connect them through a breadboard and produce results. Python scripts were made to control the device.

Group member-specific tasks were discussed, and milestones were defined to measure progress. Some of the milestones defined were to use the device to navigate a hallway, and later a sidewalk. This allows for progressive variability as a hallway is more constant than a sidewalk outside. Another milestone was the persistent identification of larger objects such as stairways, bicycles, cabinets, and general clutter.

The project plan document was completed, and a Gantt chart was produced outlining the timeline for our goals.

Pending Issues

One pending issue is that the haptic feedback motors might need to produce more vibration to be effective for daily use. This issue can result from the clothes being worn or the placement on the body. Different methods of placement on the user need to be tested moving forward. Another pending issue with the motors is the wear and tear of constant daily use.

Quantification of our product is another pending issue. We need to figure out if the displacement of the motors allows us to measure wave patterns, and if we can get the expected results from a given input. We also need to establish a form of quantifying visual data through openCV that doesn't require intensive processing.

Concerns were also raised about the success rate of multiple rounds through testing, battery life, total weight, and power use distribution. There are also current resources we are using that cannot be miniaturized to be wearable (power banks, cables, etc) that need to be retrofitted.

Another potential issue could be finding a piece of equipment similar to a Raspberry pi that has as many PWM GPIO outputs as we require. Research has been done to find such a piece of equipment, but testing would need to be done to determine if it can be viable with our design.

Plans for Upcoming Reporting Period

Our adviser has recommended some tools to investigate based on his previous expertise in the robotics field.

The following are the tools:

- Open Computer Vision and LIDAR as a form to process visuals through software and another instrument for measuring depth.
- Cambus as a method to connect the motors synchronously to one another.
- The vOICe app for android is a similar product to ours but uses audio as feedback.
- Hardhat or safety goggles for mounting, accelerometer for motors.

Furthermore, the motors we purchased must be verified that they are 1.5-3.7V, 85 mA, and an ISU IRB will be required to begin testing on someone. We also need to acquire the speed, bandwidth, and IEEE protocol number for all communication methods we use.