

Search and Rescue Robot

Team Members

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Faculty Sponsor: Philip Chan

Client: Harris Corporation

Goals and Motivation

To develop a small, remote-operated, insect-like robot that can navigate through an extremely rough terrain and provide audio/visual to the operator.

The robot will be used to search for human beings in a post-disaster environment where locating people under debris poses an extreme challenge. Once their location is ascertained, rescuers will be able to direct their efforts to rescuing the person or persons trapped.

Approach

- The robot will stream live video and audio to the operator, and will be able to receive voice from the operator.
- Operator(s) will control the robot wirelessly using a controller and a computer. They will control all components. The operator will also receive video, audio, battery strength, orientation, and location information from the robot to help navigate the terrain.
- The robot will be able to navigate through rubble in a three-dimensional environment. It will be stable up to an incline of 30° , and will be able to right itself if flipped, or be able to move in all orientations. It will be able to climb a curb of up to four inches tall, and over a trench of up to six inches across. It will also be able to traverse standing water of no more than one inch deep.

Milestone 1 (Sep 28)

- Investigate and select tools for transferring commands and media
- Investigate the possibility of simulating the robot in order to test hardware-independent software
- Create “hello, world” test for simulation and communication
- Write a software section for B-Specification document
- Create Test Plan

Milestone 2 (Oct 26)

- Implement, test, demo audiovisual feedback mechanism above ground/open air
- Implement, test, demo controller input handling and movement in a simulated, open-air environment with a few obstacles

Milestone 3 (Nov 23)

- Implement, test, demo audiovisual feedback mechanism through obstacles and underground
- Implement, test, demo controller input handling and movement in a simulated, rubble-filled environment with many obstacles

Milestone 1 Task Matrix

Task	Tyler	Milton	Devin
Test audiovisual streaming	60%	20%	20%
Test robot simulations	20%	60%	20%
Write software B-spec	25%	25%	50%
Create Test plan	25%	25%	50%