

Scout the Hazardous Environment Rover

Techo Titans' Spring 2025 EE Senior Design Project

Project Overview:

There are many types of disasters that can create dangerous environments for humans, so our project's main goal was creating Scout, a hazardous environment rover that could investigate areas humans could not. Scout was developed by our team in the spring of 2025.

Scout has a camera that transmits to a human operator from a distance, as well as a thermal camera that helps the operator with monitoring. Scout is also equipped with a geiger counter, meaning the rover is an ideal tool to send into a potentially hazardous situation before dispatching emergency personnel. Scout also has a robust design that can traverse difficult terrain, used to

Our team, the Techo Titans, includes Jordan Mahafza (Project/Software Lead), Robert "Bo" Bradford (Camera Lead), Autumn Dyar (Electrical/Mechanical Lead), Elizabeth Graham (Documentation/3D Modeling Lead), and Cole Woods (Thermal Camera Lead). Our team was formed through a shared desire to create a fun and complex project that appealed to each team member's interests and skills. Together we were able to learn and accomplish much more than any of us could have achieved alone.



Technical Specs:

For the microcontroller of our rover, we chose to use a Raspberry Pi Zero 2W, which has improved performance compared to the Raspberry Pi 4, and a built-in wireless LAN connector, which allowed for the use of wifi without an additional component needed. The rover also uses a Elegoo Mega R3 Board to reduce strain on the Pi and gain more pins for the motor connections.

The cameras are the Foxeer Razor Mini and the Axis Flying High Resolution Thermal Imaging Camera, they were chosen for their incredibly compact sizes, and good quality within the range of the project budget. They use a [Eachine TX805 5.8G 40CH FPV Transmitter](#) and a [Sologood FPV Monitor](#) receiver to display the footage on a handheld device.



The geiger counter used is a G27351 Sensitive SBM-20M Assembled Geiger Counter, which was chosen because it was able to detect the Gamma radiation that our test material would emit.