Gemini-Scout

Mine Rescue Vehicle




In a mining accident, first responders are working against the clock and against a myriad of dangers such as debris, poisonous gases, flooding, explosive vapors, and unstable structures to assess the situation and rescue trapped miners. These unknown and potentially deadly conditions create a challenge for first responders and often limit their ability to assess the situation and respond in a timely matter.

There is a need for a robotic system that could be used to support a mine rescue team, functioning primarily as a "scout." The scout concept would allow for exploration and assessment of mine conditions ahead of the mine rescue team.

The Intelligent Systems, Robotics, and Cybernetics (ISRC) group at Sandia has developed the Gemini-Scout Mine Rescue Vehicle to address this need. The Gemini-Scout is designed for maximum mobility to enable the vehicle to overcome a wide variety of obstacles and terrains, such as rubble, water, mud, and even rail-road tracks often found in a mine environment.

The Gemini-Scout is fully equipped with cameras and sensors, enabling it to provide feedback to first responders on environmental and structural conditions and can serve as a two-way communications device with trapped miners, providing critical lifesaving information to first responders.

Potential Applications

The Gemini-Scout platform is scalable from smaller to larger sizes and configurable to add on additional payloads and sensors to support a wide variety of missions such as:

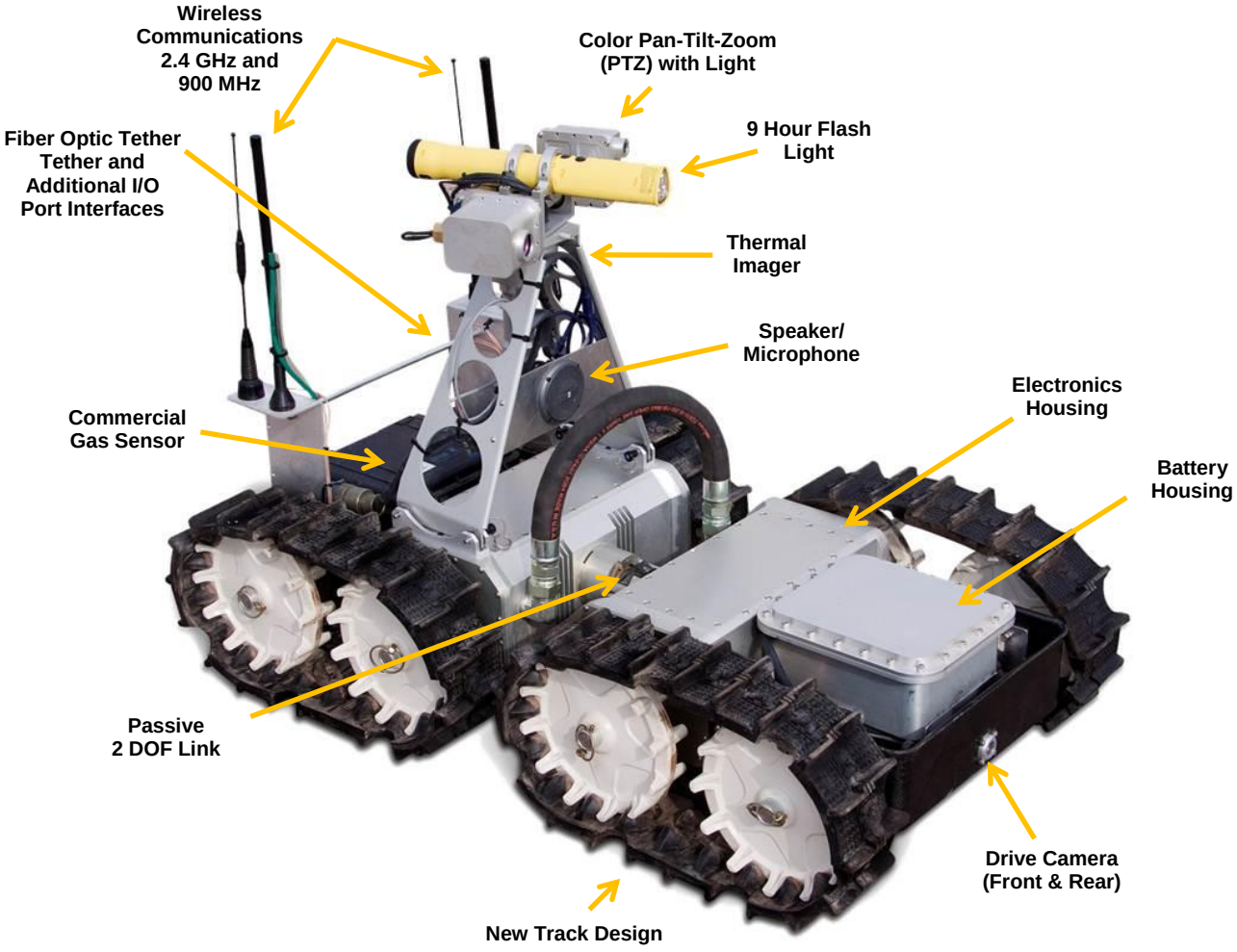
- Border tunnels
- Search and Rescue missions
- Payload deployment and delivery
- Intelligence, Surveillance, and Reconnaissance
- Support to First responders for a variety of events with unknown and potentially dangerous conditions such a natural disasters and terrorists attacks.

Features

- Extreme ground mobility
- Fully operational in ~18 inches of water
- Explosion-proof housings
- Modern PC-based control interface
- Pan-tilt-zoom color and IR cameras with 2-way radio and lighting
- Gas and temperature sensors integrated
- Available I/O's for adding payloads and sensors

Specifications

- Speed – 3.5 MPH
- Weight – 190 LBS
- Batteries – Nickel Metal Hydride (w/ 4hr minimum battery life)
- 4ft x 2ft footprint
- 2ft tall at tower
- Integrated fiber optic interface



Contact Information

robotics@sandia.gov
Subject: Gemini-Scout
Intelligent Systems, Robotics, and Cybernetics
Sandia National Laboratories

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND 2011-1518P