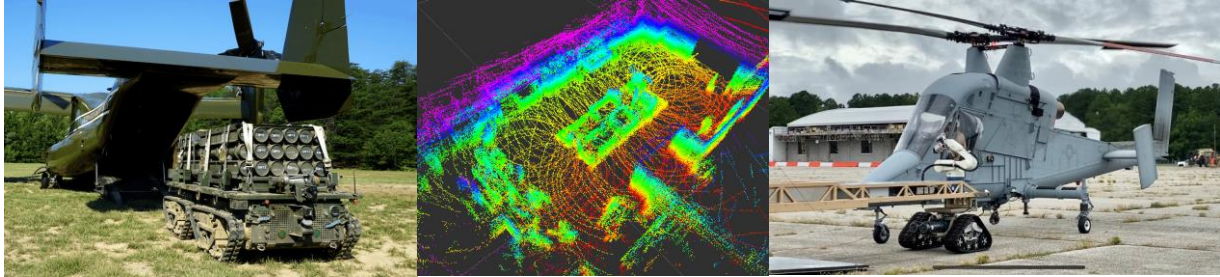




# Lidar and Camera Sensor Fusion and Person Detection



## Company Background:

At Stratom, we are driving the future of automation by developing unmanned ground vehicles and autonomous robotic systems for commercial and defense applications — whether in safe, controlled settings or dynamic and challenging terrain.

Specializing in unmanned cargo movement, autonomous mobile robots (AMR) and robotic refueling, our proven tools, methods, technologies and strategic services continuously meet our customers' unique and evolving needs in logistics and operations. Our solutions enable them to reduce monotonous, difficult or dangerous tasks to optimize uptime and efficiencies, address labor shortages, increase profitability, and keep people safe.

## Project Description:

Stratom's autonomy software leverages both lidar and camera based perception. Sensor fusion, the overlapping of camera images and lidar point clouds to get information about the depth of pixels in the camera image, can be a very powerful tool in perceiving the environment around Stratom's fleet of autonomous vehicles. The goal of this project is for students to create a program that can, given both lidar and camera inputs, detect people in frame, correlate the lidar point cloud points to camera pixels for detected people using sensor fusion, and visualize the output.

Students will focus their efforts on:

- Developing algorithms to detect people given 3D multiscan lidar point clouds and 2D image inputs in real time
- Sensor fusion of point clouds and images such that the depth information returned from the lidar can be augmented with color data from images, specifically for points and pixels corresponding to detected humans
- Organization of this functionality into ROS nodes to fit into Stratom's autonomy stack
- Visualization of this sensor fusion using RViz, ROS's 3D visualization package

Students will have the opportunity to run their code on real hardware, including lidars and cameras as well as on Stratom's fleet of autonomous robots.

**Desired Skillset:**

- C++
- ROS
- Image processing, computer vision, and machine learning techniques
- Linux

This project is an excellent way for students to leverage their foundation in C++ to develop skills in computer vision and machine learning and gain experience using ROS, an industry standard for robotics work.

**Team Size:** 3-4 Students

**Location:**

Meetings will primarily be held remotely using Teams or Zoom. Our office is located in Boulder at 5375 Western Avenue Suite A, which is the location students will be able to test their code on Stratom's robots towards completion of the project.

**Post-Project Internship Opportunities:**

Stratom is looking to hire interns and would be happy to consider students on this team!

Note: All intellectual property developed as part of this project will be owned by Stratom