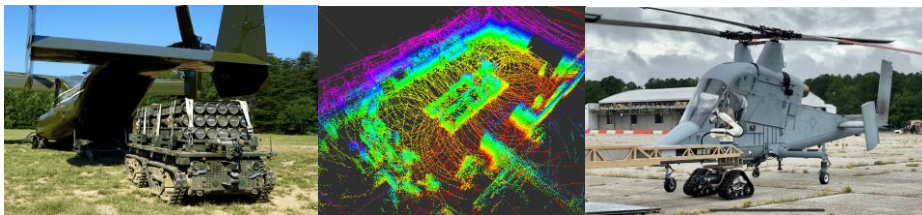# stratom

Airplane Detection with Machine Learning: Synthetic Data Generation and Object 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 is working to expand our autonomy software to allow autonomous cargo loading trucks and autonomous refueling trucks to use computer vision to identify the correct aircraft. Once this capability is developed, these autonomous vehicles will be able to identify and plan a path to the correct airplane. One important step in developing this capability is creating a machine learning model to be able to both classify the type of an airplane and locate the aircraft in an image. This project will consist of first creating a synthetic training dataset and then using it to train a machine learning model.

Students will focus their efforts on:

- Using Unity to create a range of realistic scenes that include airplanes
- Developing a training dataset of around 10,000 synthetic images of airplanes
- Training the model to accurately locate the airplanes in the images
- Evaluating the model on real-world images

Commented [AD1]: Will we be providing them with real-world images for testing? Or do we expect them to be able to find some on the web?

Commented [EG2R1]: Hopefully we have some! Otherwise we can have them find some on the web.

Desired Skillset:

- Python
- C#
- Linux
- Docker
- Machine learning frameworks such as Pytorch or Tensorflow
- 3D modeling for visual applications, i.e. Blender or Unity

Team Size: 3-4 Students

Location:

Meetings will primarily be held remotely using Teams or Zoom. Our office is located in Louisville at 331 South 104th Street, Suite 235.

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