

Custom flight simulator for fixed-wing aircraft

Sunlight Aerospace

Company background

Sunlight Aerospace is a developer of solar-powered unmanned aircraft and airborne communications systems. The company was formed in 2007 by a team of former Bell Labs and Lockheed Martin scientists and engineers. Our primary focus is the development of Sunfleets – clusters of solar UAVs with robust airframe designs, lightweight PV power, formation flight control software, and distributed communication payloads. Sunlink-X UAV is specifically designed for high-altitude long-endurance missions and will be an enabling platform for Sunfleet Networks designed for broadband wireless and internet services.



Scope of work

This work will be directed towards developing a custom plug-in module for Gazebo simulation environment, which will accurately simulate the behavior of a fixed-wing aircraft. The existing publicly available plug-ins are very inaccurate and fail to adequately reflect the expected dynamics of a flying aircraft. The students will develop a software package using C++ and algorithms describing relevant aerodynamics provided by Sunlight. The developed package will have a number of adjustable parameters describing the aircraft and environment, including wind and turbulence. The software may be tested against existing reference cases in other simulation environments. The necessary data will be provided by Sunlight Aerospace.

The students will be involved in every phase of the project from module architecture through implementation, during which the students could interact with and get support from Sunlight's employees. As a final product, the simulation package may become a valuable element for validation of new flight control algorithms and evaluation of flight performance metrics.

Sergey Frolov, VP of Sunlight Technologies, will be managing this project. Dr. Frolov has extensive hardware, software development and project management experience and can help mentor the student team throughout this course.

Desired Skill Set for Students:

We understand that all the students in the group might not have the desired technical skills. As long as they have the ability to problem solve and the willingness to learn then our engineers can help teach some of these hard-technical skills.

- C++ expertise
- Gazebo experience
- General robotics experience
- Plug-in development experience

Preferred Team Size: 3-5 Students

Given the scope of this project a group of 5 students is preferred but 3 students could also excel given they are willing to problem solve and learn.

Internships at the End of the Course:

We are happy to consider offering internships at the end of the course. A number of students are already going to be involved with our company later this summer and if there are valuable members of the team that can contribute to this project post-course, we would consider them for internships as well.

Location Where Work Should Be Performed:

Because of current restrictions due to coronavirus epidemic, this work can be performed from home.