

# Modeling swarm spacecrafts in Python: Internship at Girl in Space Club

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## Abstract

Girl in Space Club is a creative technology and human-systems design lab. They design, prototype, and commercialize equipment, tools, and experiences for people navigating future worlds—on Earth and beyond. It was founded by NASA engineer Sabrina Thompson. As part of our mission, we were tasked with creating a simulation tool that models spacecraft swarms powered by orbital mechanics, presented to users using a basketball representation to aid in understanding of how swarms function. The simulation is built using React.js to create both the backend and frontend. This will be used to demonstrate satellite swarm mechanics and be used as a learning tool for users to learn about swarms. During our presentation, we will present (1) the definition of what Project Swarm is; (2) a demonstration of how the simulation can be utilized; and (3) how the basketball representation connects to orbital mechanics.

## Index Terms

Girl in Space Club, interface, Python, Internship, swarm, Swarm Autonomy, orbital mechanics, backend, relative motion, autonomous, spacecraft, frontend, basketball, React.js, simulation