

Dear team at Gulfstream Aerospace:

I am writing to express my sincere interest in the engineering intern position at Gulfstream Aerospace Corporation, leaning towards aerostructure, flight science, and flight test engineering. As a Canadian aerospace engineering student from the University of Michigan Ann Arbor, looking to specialize in aero-structural engineering in my Master's degree, I have spent hundreds of hours in CAD, engineering drawings, and conducting fluid and structural calculation/simulations. Along with leadership experience in large and small engineering teams, I will make a valuable addition to your mechanical team.

Being a project lead at the University of Michigan rocketry team, I led a group of 12 to design, analyze, and manufacture the fins for a hypersonic (Mach 5) spacefaring rocket. A hypersonic rocket presents a few unique challenges rarely seen anywhere else in the aerospace field. These include a strict mass budget (45 lb), high aerodynamic load (600 lbf in this case), and potentially destructive aeroelastic flutter.

Thankfully, as a team, we were able to provide a few creative solutions to these problems. The main achievements that I made in my design teams are:

- Reducing the overall rocket mass by 10% while maintaining the same safety factor under identical loading conditions (2-degree AoA at Mach 2.77) through consistent optimization via CAE software (ANSYS Structural and Fluent).
- After hundreds of hours of research, provided a systemic solution against aeroelastic flutter involving moving the elastic axis behind center of mass via manipulation of internal stiffener positions.
- Optimized team design cycles, shifting design process from looping high-fidelity simulations to quick and roughly accurate hand calculations. This allowed us to iterate through all potential designs quickly and efficiently using MATLAB and focus more attention on physical prototyping and testing.

In addition, I also led a separate team of 6 in statically testing the finished prototype, where we applied weights in 100-pound sandbags and observed the deformation using a dial indicator. This may sound easy but designing a static testing rig for a 4 feet tall assembly is no joke. The test stand will have to withstand 600 pounds of force, along with the weight of the fin assembly and additional moment forces. Its development took another six months on top of the two years spent designing the fins. However, six sandbags and one human later, with only 1 inch of deformation measured by the dial indicator, we not only anchored the data from our custom simulation procedures, but also confirmed our prototype to be flight ready.

Currently, I am working as a CFD engineer intern at Volvo Truck North America, where I assist in thermal and hydro management/analysis on Volvo's latest line of trucks.

A passionate aerospace engineer and an independent worker, I believe my skill sets align perfectly with your listed opening. Thank you so much for your consideration, and don't hesitate to contact me if you have any questions.