

# STEPHEN BIRCH

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## Education

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**Rutgers University-New Brunswick**  
*Bachelor of Science in Aerospace Engineering*

**Sept. 2023 - May 2027 (Expected)**  
*New Brunswick, New Jersey*

**Interlochen Arts Academy**  
*Cello Performance*

**Sept. 2021 - May 2023**  
*Interlochen, Michigan*

## Projects

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**Computational Fluid Dynamics Program** | *C, MATLAB, MATLAB Simulink, Solidworks* **Fall 2025 (Ongoing)**

- Building a custom CFD program with compatibility with Solidworks where custom airfoils may be uploaded.
- Completed the system to translate Solidworks model into usable data for the program.
- Currently working on the fluid simulation program, making use of the Navier Stokes equations and Finite Element Analysis.
- Planning on adding a 2D slice view to observe flow across sections of the entire wing span.

**Steel Bear Canister** | *Solidworks, PrePoMax, CalculiX* **Fall 2025**

- Designed a bear canister with multiple geometries and incorporating industry standard parts in Solidworks.
- Used PrePoMax to quickly generate accurate simulations under many types of loading.
- Optimized automatic mesh generation in PrePoMax by creating custom meshing parameters and generation techniques.

**Light Activated Food Dispenser** | *Arduino, Arduino IDE, Mechatronic Engineering* **Spring 2025**

- Created a photo-detection system using photo-resistors and an Arduino computer to determine the light level.
- Built a custom control panel to allow the user to adjust the amount of food being dispensed.
- Integrated an LCD display to allow the user to see how much food is being dispensed and feeding instances.
- Designed a dispensing system using a stepper motor and a gearbox to increase torque and increase dispensing precision.

## Technical Skills

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**Engineering:** Mechanical Component Design, CAD, Dynamic System Modeling, Mechatronic Design & Analysis, Aircraft/Airfoil Design & Performance

**Software:** MATLAB Simulink, Solidworks, Microsoft 365 Suite, Microsoft Visual Studio, PrePoMax.

**Programming Languages:** MATLAB, LaTeX, Python.

## Work Experience

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**Highland Hiker** **June 2024 - August 2024**  
*Sales Associate* *Cashiers, North Carolina*

- Assisted customers in their shopping experience, particularly in shoe-fitting and other outdoors related equipment.
- Worked with the retail software RICS to assist in inventory management, receiving new product, and balancing product between the franchise locations.
- Learned about the special chemical and material properties of waterproofing materials and conditioners such as PFOS and Gore-Tex.

## Extracurricular Leadership

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**First Light Christian Acapella** **Fall 2024 - Present**  
*Treasurer* *Rutgers University-New Brunswick*

- Managed funds distributed by Rutgers University to organize equipment purchases, group travel, and food catering.
- Worked with the Rutgers University administration to raise and finance \$3,000 to attend a conference at MIT.
- Negotiated with the Rutgers University Student Association to fund a conference trip hosted by Carnegie Mellon.
- Organized fund raising events and sought out performance opportunities to elevate First Light's public presence.