Qichen Eric Dai

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Experiences

May 2022 – Aug 2022
Summer Research Student, UTIAS
Aerospace Computational Engineering Lab

- Investigated the impact of **adaptive mesh refinement** on numerical solution accuracy of **computational fluid dynamic solvers**.
- Optimized shape of 2-D airfoils by inversely matching pressure profile over airfoils using **adjoint-based optimization methods**.
- Implemented a numerical solver **using finite element method** to solve 1D nonlinear reaction-diffusion equation.

Sept 2022 – Feb 2023
Propulsion Intern, *SpaceRyde Inc.*

- Designed a **water venturi rig** to test different venturi configurations using **SolidWorks**. Structural validity and flow conditions are simulated and verified using **Ansys Mechanical and Fluent.**
- Designed and integrated a payload for a **High-Altitude Balloon flight experiment** to construct thermodynamic models for our rocket in stratospheric conditions.
- Constructed a website to track the location of the balloon in real time using HTML and JavaScript.
- Used **SolidWorks** to design a **venturi** for rocket engine flow regulation, and verified flow conditions via **Ansys Fluent and CFx.**
- Developed an iterative rocket configurator using **python** to optimize rocket designs based on given design parameters.

May 2020 – Aug 2020, May 2021 – Aug 2021
Design Engineer Intern, *Legere Reeds*

- Optimized workflow of synthetic instrument reed design and manufacturing between CAD and CAM processes.
- Used **Fusion360** and **MeshLab** to create digital reed surface models.
- Used **Python** to preprocess digital reed surface models, and interface with other design software.
- Created a **reed surface sampler** using **Python** and **NumPy-STL** library to generate customized digital reed surface profiles for CNC machines.

Education

2019-2024 (projected)
BASc. in **Engineering Science Aerospace Option**
University of Toronto
GPA: 3.80
Relevant courses

- Calculus and Linear Algebra
- Ordinary/Partial Differential Equations
- Scientific Computing
- Aerodynamics and Gas Dynamics
- Materials of Solids and Structures
- Control Systems

Technical Skills

- **Coding language**: Python, MATLAB, C, Verilog, and Assembly Language
- **CAD**: SolidWorks and Fusion360
- **Simulation**: Ansys (Fluent, Mechanical, CFx)
- **Computational Fluid Dynamics**
- **Finite Element Analysis**
- **Numerical Optimization**
- **Design Engineering and Integration**
- Microsoft **Excel** & **Word**, **Google Suites**, and **LaTeX**
- **Rocket Propulsion**

Soft Skills

- Initiative for challenges
- Curiosity
- Teamwork and collaboration
- Good time management between multiple projects
- Quick adaptation to new environment and schedule changes