**ANDI ZHOU**

Canadian Citizen

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**Education**

**University of Michigan Ann Arbor Ann Arbor, MI**

*Master of Science in Engineering* Expected Graduate

**Major: Aerospace Engineering GPA N/A**

*Bachelor of Science in Engineering* Graduated May 2022

**Major: Aerospace Engineering GPA 3.7/4.00**

**Clubs/Programs –** Michigan Aeronautical and Science Association (MASA), Sigma Gamma Tau, Michigan Active Aeroelasticity

and Research Laboratory, AIAA

**Skills**

**Engineering Skills:** Compressible Flow, Multi-Phase Flow, Thermodynamics, Heat Transfer, Thermal Management

**CAE Software:** PowerFLOW, ANSA, Star CCM+, Solidworks, ANSYS, NASTRAN, Linux OS

**Coding Language:** MATLAB, Python, C++, Simulink

Awards: **Dean’s Honor List & University Honors (2018 – 2021)** | **Sigma Gamma Tau –** NationalAerospaceHonorSociety

**Work Experience**

**Solar Ship Inc.** Toronto, ON

*Mechanical, Test Engineer Intern, and Drone Test Pilot May 2022 – August 2022*

* Worked tightly with a team of 6 engineers, designed the gondola for an 11-m diameter, human piloted, solar-electric tsorocopter airship used for disaster relief in remote areas
* Designed and prototyped a light, ergonomic, 11-G crash-resilient extendable controller mount for an 11-m diameter airship, allowing a 2-m tall pilot to fly the aircraft comfortably and safely
* Modeled and integrated all avionic component within the avionics bay, reduced the size of avionics bay by 40% while lowering the entire vehicle mass by 5%
* Designed and conducted flight tests of a 3-m diameter tsorocopter at highly irregular hours, while maintaining the safety of other operators in addition to the equipment

**Volvo Group Truck Technology** Greensboro, NC

*Powertrain Simulation Intern*  *January 2022 – May 2022*

* Designed, investigated, and optimized a swirl air-water separation tank which maintained a separation efficiency of 99% while decreased its mass from the original concept by 40%
* Collaborated with Dassault Systèms, optimized water draining in truck air intake using PowerFLOW multi-phase flow, ensuring the system is up to standards as per SAE J554
* Cleaned 100s of powertrain CAD models and generated for them fine and efficient meshes for thermal simulations using ANSA
* Gained extensive experience working in an Agile team and a large company of 100,000 people

**Project Team Experience**

**MASA (University Rocketry Team)** Ann Arbor, MI

*Rocket Fin Lead* *September 2019 – Present*

* Led a team of 12 in designing, simulating, and manufacturing rocket fins able to take on supersonic flight loads
* Organized design reviews, conducted engineering work sessions, led to team to eventually optimizing the apogee of our rocket by 30%
* Designed the structure to a SF of 1.5 with a loading condition of 2-degree AoA at Mach 2.77, reducing the weight of the overall rocket by 10% while maintaining the same performance at identical loading conditions
* Contacted out-of-house manufacturers; fabricated a 4-ft tall, 3-ft wide rocket fin assembly leveraging advanced sheet metal manufacturing techniques such as bump bending and brake pressing

*CFD Engineer January 2021 – Present*

* Performed high-fidelity 3D full body CFD for a 27-ft rocket traveling at Mach 4.49 and converged the simulation to the 5th order of accuracy
* Conducted aero-thermal-structure interaction studies and optimized thermal-structural SF to 2
* Analyzed both steady and transient rocket aerothermodynamic behavior at Mach 4.49 by performing high-fidelity fluid simulation leveraging K-Omega and K-Epsilon turbulence models using ANSYS Fluent and STAR-CCM+
* Spent 100s of hours after school to generate fine and efficient meshes with Y+ values below 5 and is the first on the team to successfully converge the simulation using the U of M Great Lakes HPC Cluster

*Testing Engineer Lead September 2021 – December 2021*

* Led a team of 6 in testing the largest fin assembly (3-ft wide, 4-ft tall) that MASA has ever built
* Investigated dynamic roll behaviors using a 5’ by 7’ wind tunnel; quantified moment and angular acceleration due to aerodynamic effects and explored the possibility of inertial roll coupling
* Conducted static testing of the fin surface, analyzed data and compared with those given in Finite Element Analysis; confirming that the error range stayed within 20%
* Optimized team design cycles; accelerated design duration by 70%

**Research Experience**

**Active Aeroelasticity and Research Laboratory** Ann Arbor, MI

*Undergraduate Research Assistant September 2020 – May 2021*

* Evaluated BWB type aircraft with NASTRAN using SOL 101, 103, 144, 145 and 400 to study its structural, modal and aeroelastic behaviors under subsonic speed with varying angle of attack and compressibility factor
* Wrote finite element codes with MATLAB, allowing for NASTRAN to iteratively solve for varying loading conditions and automatically provide the most optimized structure for the load case given

**Berlin Institute of Technology** Berlin, Germany

*International Research Intern* *April 2019 – July 2019*

* Verified drag coefficients and forces of experimental vehicles using wind tunnels measurements and compared with ANSYS Fluent results
* Optimized vehicle aerodynamic based on geometry changes guided by wind tunnel experiments and decreased the overall drag coefficient by 0.02

**Personal Projects**

**Custom CFD Solver** Ann Arbor, MI

*Programmer January 2021 – September 2021*

* Single-handedly coded a custom CFD solver utilizing the method of fractional velocity to solve the steady incompressible Navier-Stokes equations
* Verified the above CFD code using the classic lid-driven cavity test case up to a Reynolds number of 5000
* Using the shallow water equation, programmed a transient solver investigating tank sloshing
* Programmed a Finite Volume Solver to investigate the spread of COVID-19 within a classroom leveraging concepts of potential flow
* Optimized channel flows using Finite Element Methods and principles of unstructured mesh

**Remote Controlled Propeller Driven Hovercraft** Ann Arbor, MI

*Aerodynamic and Electrical Engineer (Team of 4) January 2020 – May 2020*

* Performed internal CFDs using STAR-CCM+ to evaluate hovercraft lift force, predicting the amount of propeller power and inlet diameter needed to achieve take-off
* Designed the electrical harnessing for the hovercraft, ensuring enough voltage and current is provided to flight-critical hardware such as the engine controller and the flight computer