ANDI ZHOU

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Dear Ms. Annie King and the Tesla Recruiting Team,

I hope this letter finds you well! Recently, I had the privilege of advancing to the final round for the Thermal Performance Validation role at Tesla Energy. While I was not chosen, I was deeply impressed by the team's warmth, their willingness to share insights, and the evident pride in their work. These interactions only strengthened my desire to contribute to Tesla's ongoing innovation and the vision of an electrifying future. After reflecting on my discussions with the thermal validation team, and considering my experience in thermal simulation and validation, I believe I would be a potential fit for the Thermal System Aerodynamicist position.

While my timeline might seem shorter, the depth, intensity, and outcomes of my internships and project team experiences have equipped me with a skill set I am confident rivals that of many with more extended periods of exposure.

At Zoox, I revived a powertrain coolant system test stand that was stagnant for 2 years in just 9 weeks. This project sought to validate the 1D simulation previously conducted by our team. My design recommendations, based on my testing data, increased the system flow rate by 7.5%. My manager highlighted my fast-paced work ethic and emphasized that I produced more data in 9 weeks than the project had in the previous 2 years.

Further enriching my experience in CFD software are my internships at Volvo Truck North America, where I designed a swirl air-coolant separation tank using Star CCM+ multiphase flow, achieving a 99% air separation efficiency and reducing its mass by 40% compared to the original concept given.

To further my expertise in simulation, I implemented my own CFD solver for both Euler's equation of compressible flows and the incompressible Navier-Stokes equation. I firmly believe that as a thermo-fluid engineer specializing in simulation, it's crucial to peek into the black box of contemporary CFD software. In this project, I've implemented both the first and second-order finite volume methods, as well as the advanced Discontinuous Galerkin finite element method for both external and internal flows.

Tesla's impact on the modern automotive landscape is revolutionary, and the vision of transitioning the world to sustainable energy is truly inspiring. It's this game-changing innovation, coupled with the passionate and forward-thinking culture, that makes Tesla exceptionally special to me.

Thank you for considering my application, and I am looking forward to hearing back from the team!

Sincerely,

Andi Zhou

ANDI ZHOU

Canadian Citizen
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Education

University of Michigan Ann Arbor **Ann Arbor, MI**
M.S.E Aerospace Engineering – Computation & Aerodynamic **GPA 3.86/4.00**
Master of Science in Engineering Graduating December 2023
B.S.E Aerospace Engineering **GPA 3.7/4.00**
Bachelor of Science in Engineering Graduated May 2022
Clubs/Programs – Michigan Aeronautical and Science Association (MASA), Sigma Gamma Tau, Michigan Active Aeroelasticity and Research Laboratory, AIAA, **Private Pilot License (PPL)**

Skills

Engineering Skills: Thermal System Design, CFD, Numerical Optimization, Heat Transfer, Multi-Phase Flow, Data Inferencing
CAE Software: ANSA, CATIA, IPEMotion, Star CCM+, PowerFLOW, Solidworks, ANSYS, NASTRAN, Linux OS
Coding Language: MATLAB, Python, C++, Simulink
Awards: **Dean's Honor List & University Honors (2018 – 2022)** | **Sigma Gamma Tau –** National Aerospace Honor Society

Work Experience

Zoox Inc. Foster City, CA
Thermal System Intern *May 2023 – August 2023*
- Took charge of a 2-year stagnating cooling system flow test rig; constructed and finished it in 9 weeks, yielding key flow data for the L5 vehicle cooling system.
- Made P&ID design recommendations that increased system flowrate by 7.5%.
- Accelerated testing time from 3 hours to 30 minutes using Python/VBS automation script.
- Designed flow testing instrumentation diagram; worked extensively with thermocouples, pressure sensors and flowmeters.

Solar Ship Inc. Toronto, ON
Mechanical, Test Engineer Intern *May 2022 – August 2022*
- Designed an 11-G crash-resilient extendable yoke mount for an airship cockpit, ensuring safe, reliable and ergonomic control for all pilots.
- Collaborated with 6 engineers to design a gondola for an 11-m solar-electric tsorocopter airship for remote area disaster relief.
- Optimized avionics integration using Solidworks CAD, shrinking avionics bay size by 40% and reducing vehicle weight by 5%.

Volvo Group Truck Technology Greensboro, NC
Powertrain Simulation Intern *January 2022 – May 2022*
- Optimized a swirl air-coolant separation tank using Star CCM+, achieving 99% separation efficiency and reducing its mass by 40%.
- Refined 100s of powertrain CAD models using ANSA, repairing surfaces, and creating efficient meshes for thermal simulations via ANSA.
- Partnered with Dassault Systèms to enhance truck air intake water drainage, meeting SAE J554 standards using PowerFLOW.

Leadership Experience

MASA (University Rocketry Team) Ann Arbor, MI
Aero CFD Lead *January 2021 – June 2021*
- Led high-fidelity 3D CFD for a 27-ft rocket at Mach 4.49 and converged to 6th order of accuracy.
- Achieved a thermal-structural SF of 2 at Max-Q via aero-thermal-structural optimization using ANSYS Suite.
- Used K-Omega and K-Epsilon turbulence models in ANSYS Fluent and STAR-CCM+ to study rocket aerothermodynamics at Mach 4.49, both steady and transient.

Personal Projects

Custom CFD Solver Ann Arbor, MI
Programmer *January 2021 – May 2023*
- Implemented a CFD solver for Euler's Equation using C++ and MATLAB; incorporated 1st and 2nd order Finite Volume Method as well as advanced Discontinuous Galerkin methods.
- Added an adaptive meshing algorithm, refining the computational mesh based on criteria like cell edge length and Mach Number.