Miles Chan, PhD

Thermal/Fluid System Modeling & Simulation · High Performance Computing · Rapid Prototyping · US Citizen

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Skills

Fluids/Thermal Modeling Theory, low- and high-fidelity CFD (RANS, DNS, LES, WMLES), meshing, roughness modeling, immersed boundary method (IBM), pre- and post-processing, XFOIL, AVL

Data Analysis MATLAB, Python, ParaView, digital signal processing (DSP), statistical testing

System Modeling Simulink, flight vehicle dynamics/performance, control theory/algorithms, linear systems theory, linear algebra, differential equations

Software Development/HPC Linux, C++, SLURM, parallel computing (MPI), Git, object-oriented programming

Mechanical Design/CAD SolidWorks, Inventor, Fusion 360, CATIA, NX, hand calcs, FEA (ANSYS, COMSOL, FEMAP, NASTRAN)

Rapid Prototyping waterjet, laser cutter, mill, lathe, FDM & resin 3D printing, CNC router, soldering, hand tools, Arduino

Work Experience

Turbulence Modeling Research Lead, Caltech and Stanford *Pasadena & Palo Alto, CA* *06/2020 - 03/2025*

- Developed multifidelity data-driven and physics-based modeling approaches for predicting the turbulent flow response (drag) to engineering-relevant roughness geometries while reducing computational cost in MATLAB.
- Implemented high-performance computing algorithms (MPI, C++, CUDA, pre- and post-processing techniques) to study parameter sensitivity, parallelize workflows, and improve performance.
- Synthesized and communicated key research results in written thesis, oral presentations at conferences, and submitted papers.

Stress Analyst, Honda Aircraft Company *Greensboro, NC* *08/2017 - 12/2017*

- Developed and automated workflows for structures team tasks, including modeling structural allowables and point loads using Python, FEMAP, and NASTRAN.

Flight Sciences Analyst, Honda Aircraft Company *Greensboro, NC* *01/2015 - 05/2017*

- Developed physics-based analytical/empirical models for flight vehicle dynamics and aerodynamic quantities depending on deployment of control surface/landing gear/configuration to determine limits used by flight test engineers.
- Analyzed wind tunnel data for model validation and parameter identification using MATLAB.

Flight Controls Engineer, Honda Aircraft Company *Greensboro, NC* *05/2016 - 08/2016*

- Automated and streamlined existing fault isolation methods by creating decision trees, written procedures, and avionics readouts for flap actuation diagnostics for usage by customer-facing engineering.
- Investigated and categorized production defects to determine target areas for root cause analysis and redesign by the mechanical systems team.

Robotics Alliance Project Intern, NASA Ames Research Center *Mountain View, CA* *05/2015 - 08/2015*

- Responsible for the design and rapid prototyping of scoring system for drone racing competition. Used CAD, proximity sensors, Arduinos, and 3D printing to build sensor mounts, electronics packaging, and structural elements.

Education

California Institute of Technology *Pasadena, CA, USA*

PhD in Aerospace Engineering *05/2025*

Thesis: Reduced Order Modeling of Near-wall and Roughness Sublayer Turbulence Using Resolvent Analysis

Advisor: Dr. Beverley McKeon

MS in Aeronautics *06/2020*

Georgia Institute of Technology *Atlanta, GA, USA*

BS in Mechanical Engineering *with highest honor* *05/2019*

Community/Extracurricular Activities

Graduate Student Council Representative, Graduate Aerospace Laboratories at Caltech

- Organized student research seminars / Charles Babcock Award for outstanding contributions to teaching efforts / Peer mentor

Prototyping Instructor, Invention Studio Maker Space at Georgia Tech

- Taught students to use machine shop tools and prepare CAD with GD&T for manufacturing / Responsible for waterjet maintenance

Caltech Triathlon, Caltech Alpine Club, Stanford Cycling, Caltech Music, Stanford Music

- Organized team workouts / 2:57 marathon, Ironman 70.3 finisher / Violinist active in orchestra, chamber music & private studies