Zachary Wong

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EDUCATION

University of California, Los Angeles (UCLA), Samueli School of Engineering

Master of Science, Mechanical and Aerospace Engineering *(GPA 4.0/4.0)* Expected: March 2022

Bachelor of Science, Mechanical Engineering *(GPA 3.5/4.0)* September 2016 to June 2020

TECHNICAL SKILLS

Design, Modeling, and Fabrication: ANSYS Fluent**,** Solidworks, Autodesk Fusion 360, FDM 3D Printing, Labview
Coding: Python, Julia, MATLAB, LaTeX

RESEARCH/TEACHING EXPERIENCE

UCLA Samueli School of Engineering University of California, Los Angeles

MAE105A Thermodynamics Teaching Assistant January 2022

- Will assist professor in course logistics, formulate problem sets and exams and lead weekly discussion sections

MAE105D Transport Phenomena Teaching Assistant September 2021 to Current

- Assisting professor in course logistics, formulate problem sets, and lead weekly discussion sections

MAE105A Thermodynamics Course Instructor August 2021 to September 2021

- Designed and taught classical thermodynamics course to a group of thirteen students as part of UCLA's CEED initiative

Nano Transport Research Group University of California, Los Angeles

Graduate Researcher June 2020 to Current

- Built high-resolution k-ω SST computational model (ANSYS FLUENT) to quantify maldistribution effects on heat transfer and pressure drop for turbulent flow in shell and tube heat exchangers
- Conducting experimental performance tests to obtain pressure, temperature, and velocity data within subscale heat exchanger in sCO2 flow loop
- Collaborated with graduate researcher (Akshay Krishna) to design Julia-based VAT-based numerical model and used genetic algorithms to optimize results.

Morrin Gier Martinelli Heat Transfer Memorial Laboratory University of California, Los Angeles

Undergraduate Researcher October 2019 to June 2020

- Investigating the stability of couette flow through eccentric rotating cylinders as a model for hydrodynamic bearings
- Performed extensive literature review on hydrodynamic stability

Research Assistant June 2019 to September 2019

- Adapted MATLAB code to enable object tracking and image processing of high speed camera footage
- Performed wind tunnel tests with instruments including a pitot tube, pressure transducers, and anemometers.
- Processed and analyzed data using MATLAB and Excel

Axel Guenther Microfluidics Laboratory University of Toronto

Research Assistant June 2017 to August 2017

- Utilized design, modeling, and analysis software (Adobe Illustrator, Powerpoint, Labview, MATLAB) to
- Synthesized large volumes of research to create condensed summaries and briefings
- Devised and executed wet lab and clean room trials producing and testing hydrophobic biomaterials

ENGINEERING PROJECTS

Finite Volume Compressible Flow over Cylinder

- Developed a MATLAB code to model supersonic flow over an infinite cylinder

Senior Capstone: Autonomous Robot for Block Transport

- Worked with 5 students to design and model a fully autonomous robot in MATLAB/Simulink, which received an award for its control system implementation. Physical testing was unavailable due to COVID19.

sCO2 Geothermal Power Modeling and Analysis

- Analyzed system processes to determine overall power outputs and efficiencies
- Modeled and optimized heat transfer and retention through geothermal pipes using Matlab

3D Printed Quadcopter

- Designed, printed, and tested a fully 3D printed payload drone body using Fusion 360 and Cura in a team of 5 students
- Personally protoyped models for functional drone legs and arms

ADDITIONAL INFORMATION

Publications *(In progress)*

- Jin, K., Krishna A.B., Wong, Z.W., Fisher, T.S. (2021). Experimental Demonstration of Supercritical Carbon Dioxide Heat Exchanger Under Extreme Conditions
- Jin, K., Krishna A.B., Wong, Z.W., Fisher, T.S. (2021). A Critical Review of Heat Exchanger Design and Optimization for Extreme Temperature and Pressure Conditions
- Wong, Z.W., Jin, K., Krishna A.B., Fisher, T.S. (2022). Compact Maldistribution Metrics for Shell and Tube Heat Exchangers

Conference Talks

- ARPA-E Energy Innovation Summit May 2021
  Superalloy Heat Exchangers Optimized for Temperature Extremes and Additive Manufacturability
- International Mechanical Engineering Congress (IMECE) November 2020
  Design Optimization of Compact Superalloy Heat Exchangers for Extreme Temperature and Pressure Conditions

ADDITIONAL INFORMATION

Work Experience

- UCLA Undergraduate Science Journal Editor December 2019 to Current
- UCLA MAE Department Grader (MAE105A/MAE133A) January 2019 to June 2019

Awards

- First Place – Green STEM Summit – For a concept and lab work testing the antimicrobial properties of pure metals for use in hospitals in schools

Professional Associations

- American Society of Mechanical Engineers November 2016 to Current
- National Forensics League March 2016 to Current

Outreach

- UCLA Space Public Outreach Team December 2021 to Current