

# Nolan Ryan Chu

116 Cox Street Apt 10 | Auburn, AL 36830 | nrc0011@auburn.edu | (334-663-0228)

## Objective

To exercise analytical skills in a challenging environment such as but not limited to research and development

---

## Qualifications

- Multifunctional problem solving ability
- Proficiency in high volume data analysis

---

## Education

Auburn University | Auburn, AL

*Doctorate of Philosophy, Mechanical Engineering* | May 2023 (GPA: 4.00/4.00)

*Dissertation Title – “A Rough Surface Mixed Lubrication Model of Machine Component Interfaces with an Experimental Evaluation”*

*Master of Science, Mechanical Engineering* | May 2018 (GPA: 4.00/4.00)

*Bachelor of Sciences in Applied Mathematics-Actuarial Science* | May 2016 (GPA: 3.94/4.00)

*Bachelor of Mechanical Engineering* | May 2016

---

## Work Experience

Auburn University

Teaching Assistant, January 2020 – May 2023

- Created answer keys for and graded quizzes for machine design and fluid dynamics
- Held office hours to answer students' questions
- Proctored exams and taught lectures when professor travels

Dr. Robert Jackson, Auburn University

Graduate Research Assistant, May 2016 – May 2023

2023

- Created numerical models of rough surface contact for Ford and combine them with a lubricant pressure model to ultimately predict frictional losses in a piston ring system
- Established a method that allows MATLAB output to be used by Abaqus and vice versa
- Incorporated the effects of frictional heating in the combined rough surface contact-lubrication model and determined whether it they improved the model prediction relative to experimental measurements
- Performed a finite element analysis of elastic cylindrical contact in ANSYS that either neglects or incorporates friction to determine whether a plane stress or a plane strain assumption is more appropriate
- Analyzed measured data, namely friction coefficients, to calculate an average that can be compared to theoretical models

Ford Motor Company

College Intern, May-August 2019

- Enhanced combined rough surface contact and lubrication model by including deformations calculated in Abaqus to predict the Stribeck behavior more accurately
- Conducted friction tests of a piston ring oscillating against a cylinder liner under various load, speed, and temperature conditions to validate the combined model

Dr. Jay Khodadadi, Auburn University      Research Assistant, June 2015-May 2016

- Solved computational fluid dynamics problems using ANSYS Icepak
- Analyzed steady and transient fluid flow and heat transfer to model high temperature phase change materials, which could be used for energy storage

Dr. David Bevely, Auburn University Research Assistant, October 2013-April 2014

- Determined for my group to not use Kapsch Dedicated Short Range Communications radios for a project
- Wrote MATLAB code that determines a vehicle's lane position relative to the road edge for safety purposes

---

## Honors

Dean's List – Fall 2012, Spring 2013, Fall 2013, Spring 2014,  
Spring 2015, Fall 2015, Spring 2016 semesters

Phi Kappa Phi Honor Society

---

## Presentations and Publications

*A Mixed Lubrication Model of Piston-on-Ring Contacts Considering Temperature Dependent Shear Thinning and Elastic-Plastic Contact*, STLE Annual Meeting and Exhibition, Long Beach, CA, 21-25 May 2023

*A Mixed Lubrication Model of Piston on Ring Contacts Considering Temperature Dependent Shear Thinning and Elastic-Plastic Contact*, *Lubricants* 2023, 11(5), 208.

*Evaluating Elastic-Plastic Wavy and Spherical Asperity-Based Statistical and Multi-Scale Rough Surface Contact Models with Deterministic Results*, *Materials* (Basel). 2021 Jul 10;14(14):3864.

*An Investigation of the Elastic Cylindrical Line Contact Equations for Plane Strain and Stress Considering Friction*

- Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology, 236(9), 1889–1897.
- Best Oral Presentation, International Tribology Research Symposium 2020

*The Effects of Asperity Geometry on Elastic-Plastic Statistical & Multi-Scale Rough Surface Contact*, Tribology Frontiers Conference, Chicago, IL, 27-31 October 2018

---

## Software Proficiencies

MATLAB, SolidWorks, ANSYS, Abaqus

---

## References

Available upon request.