

KRITTIN KULRATTANARUKS

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Education

University of Washington

September 2022 – March 2024 (Expected)

Master of Science in Mechanical Engineering (Data Science)

Seattle, Washington, United States

GPAX = 3.86, Awarded a scholarship from the Royal Thai Government for full tuition and monthly allowance

Relevant Coursework

- Fluid Turbulence
- Data-driven modeling & control
- Parallel Computing
- Computational techniques
- Continuum Mechanics
- Database System

Chulalongkorn University

August 2017 – May 2021

Bachelor of Engineering in Mechanical Engineering

Bangkok, Thailand

GPAX = 3.77 (1st class honors), Rank 5th in the department, Awarded a scholarship from Bank of Thailand

- Finite Element Method
- Compressible Fluid Dynamics
- Turbulent Shear Flows
- Intelligent System
- Power Plant Engineering
- Internet of Things

Experience

University of Washington

March 2023 – June 2023

Grader, ME426 Renewable Energy II

Seattle, Washington

- Grading students' submission according to the given solution using Gradescope
- Report summary and feedback of students' work

University of Washington

January 2023 – March 2023

Grader, ME525 Applied Acoustics I

Seattle, Washington

- Grading students' homework according to the given rubric and brief
- Report overall performance of student and common mistake in homework

National Metal and Material Technology center

May 2020 – July 2020

Intern

Pathum Thani, Thailand

- Conducted research project focused on laser welding simulation using COMSOL Multiphysics®
- Assisted with experiments conducted by the advanced engineering systems research team

Chulalongkorn University

October 2019 – December 2021

Laser cut specialist, MI Workspace

Bangkok, Thailand

- Provided laser cutting service
- Supervised usage of laser cutter
- Managed borrowing and returning of basic mechanic equipment in the workshop
- Taught how to use laser cutter to new user

Projects

Reynolds stress discrepancy prediction using physics-informed machine learning | *Python, COMSOL* June 2023

- Simulated channel flows in RANS simulation with COMSOL Multiphysics® using the v2-f turbulence model
- Developed Python code in *VS Code* to download Direct Numerical Simulation (DNS) result from Johns Hopkins Turbulence database
- Normalized physics-justified properties and used it as input parameters for machine learning model
- Differentiate Reynolds stress between RANS simulation and DNS simulation and used it as output parameter for models
- Split, trained, and evaluated performance of the model that use random forest regression
- Repeat the training and testing process using multi-layer perceptron regression and compare the performance between each algorithm

Numerical simulation of melt pool shape in laser welding | *COMSOL Multiphysics®*

May 2021

- Explored the possibility of multiphase simulation in laser welding process
- Compared the simulation result with relevant laser welding research result
- Simulated the flow in the melt pool of SS316L stainless steel using 2D multiphase simulation in COMSOL Multiphysics®

Face tracking & recognition robot | *Python*

December 2020

- Developed Python code for Raspberry Pi to detect human face
- Controlled robot using STM32 to keep the face in the middle of the camera
- Trained machine learning model to recognize owner's face and accelerated machine learning inference speed with Google Edge TPU coprocessor.
- Sent notification to owner's phones when detect stranger's face

Chula Prana Emergency Ventilator | *AutoDesk: Fusion360, Laser Cutter*

May 2020

- Developed device attached bag valve mask to automatically squeeze the self-inflating bag
- The device can be mass produced by laser cutter and other components can be locally purchased
- Designed the contact surface between the device and the bag valve mask
- Tested and improved the reliability of the emergency ventilator

Technical Skills

Programming Languages: Python, MATLAB & Simulink, SQL, \LaTeX

Engineering Simulation Software: ANSYS, COMSOL Multiphysics[®]

CAD: Fusion 360, SolidWorks, CATIA, AutoCAD

Microcontroller: Arduino, Raspberry Pi, STM32

Manufacturing: 3D printing, Laser cutter, Water jet cutter, Okuma CNC lathe, Mazak CNC

Certification: American Academy of Underwater Sciences (AAUS) scientific diver

Extracurricular

UW Human Powered Submarine

Autumn 2022 – Present

Dive Team

University of Washington

- Awarded 2nd place for overall performance in 17th International Submarine Races at Carderock, Maryland (June 2023)
- Achieved 2nd place for speed in the college division in 17th International Submarine Races
- Provided support for the pilot and technical teams during underwater tests and at the competition

CU-RoboCovid Development Team

March 2020 – May 2020

Prana Emergency Ventilator team

Chulalongkorn University

- Designed and developed emergency ventilator for mass production in case of ventilator shortage due to COVID-19 outbreak
- Helped manufacturing 'Pinto' robot a delivery robot with Tele-presence system for inpatient with mild COVID-19

CU Mechanical Engineering student committee

December 2018 – February 2020

Student Engagement team and Event organizer

Chulalongkorn University

- Feb 2020: Organizer (PR team) in 'ME night' 1st Homecoming for ME CU alumni
- Dec 2019: Chief Coordinator of Location and Logistic for 2nd Joint Voluntary Camp with Srisavarindhira Thai Red Cross Institute of Nursing
- Aug 2019: Organizer (Survey and planning team) in Industry site visit and orientation camp in Rayong, Thailand
- Aug 2019: Chief Organizer of mechanical engineering student orientation
- Dec 2018: Participant in 1st Joint Voluntary Camp with Srisavarindhira Thai Red Cross Institute of Nursing

Annual Voluntary Engineering Student Camp

June 2018 – July 2020

Participant

Chulalongkorn University

- Constructing infrastructure in Thai rural area
- Jul 2020: Constructing a restroom for elementary school in Koh Mak, Thailand
- Jun 2019: Constructing a large plumbing system in Surin, Thailand
- Jun 2018: Constructing a large plumbing system in Prachuap Khiri Khan, Thailand