MIU LUN (ANDY) LAU

Highly motivated Computational Scientist with extensive experience in multiscale modeling. Extensive experience in FEM, Phasefield, and Molecular Dynamics. Skilled in numerous optimization methods using Machine Learning pipeline. Efficient and confident while working individually or in a team environment.

CONTACT

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SKILLS

Programming

Python
Bash
C++/C
CUDA
LaTeX
Matlab

Operating Systems

Linux
MacOS
Windows

Software & Tools

Visualisation
(e.g. matplotlib, gnuplot, ...)
Data handling/analysis
(e.g. numpy, scipy, pandas, ...)
Machine Learning
(e.g. tensorflow, scikit learn, ..)
Distributed System
(e.g. Sawtooth, Falcon)
Cads Software
(e.g. Solidworks, Fusion 360)

Languages

English
Cantonese

EDUCATION & EMPLOYMENT

08/2018 - 07/2023 (expected)
Boise State University, Boise
Computational Science and Engineering
Doctor of Philosophy

05-2017 - 09-2017
Idaho Fall, Idaho
Undergraduate Internship
Idaho National Laboratory

08/2014 - 05/2018
Boise State University, Boise
Mechanical Engineering
Bachelor of Science

RESEARCH EXPERIENCE

Analysis of extended X-ray absorption fine structure using AI techniques

- Developed machine learning algorithms and data query pipeline for analyzing EXAFS Spectra using Genetic Algorithms
- Developed automated analysis of *in-situ* and operando measurement of EXAFS spectra such as batteries and irradiation
- Conducted rapid analysis of large scale data (>10 Gb) from third generation synchrotron and accelerators
- Developed algorithms have extended to other spectrum technique such as XPS and Nano-indentation

In situ ion irradiation of amorphous TiO2 nanotubes

- Conducted large scale molecular dynamics modeling of TiO_2 (Anatase, Rutile, Amorphous) using LAMMPS
- Performed ion-irradiation modelling and analysis of surface morphology defects of TiO_2
- Constructed customize empirical hybrid functionals using Machine Learning fitting
- Analyzed irradiation-induced volume and crystallization transformation

Topology optimized studies for additive manufacturing heat exchanger

- Performed molecular dynamics studies of Zeolite 13X with Kaolin and Bentonite binder for use in additive manufacturing
- Developed custom machine learning algorithms for topology optimized geometry using GA with supplement from Finite Element Analysis (FEM) and Computational Fluid Dynamics (CFD)

Tetrahedral Mesh Generation with Nodal Attributes from a Point Cloud

- Developed python based workflow to generate a tetrahedral mesh with nodal attributes from a point cloud
- Applied to reservoir engineering point cloud dataset with over 10 million points
- Performed dynamics and steady state fluid modeling of reservoir flow through CFD

ACHIEVEMENTS, HONOURS AND AWARDS

- Jefferson Lab AI Hackathon 1st Place, 2021
- Dean's Honor List, 2014 - 2018
- National Honors Society, 2014- 2018