Lawrence Lai

+1 (626)-202-2052
laitcl@gmail.com | http://laitcl.mit.edu/
https://github.com/laitcl | https://www.linkedin.com/in/laitcl/

Skills

Programming Languages	Python, MATLAB, Java Script
Data Engineering Specific Tools	Kafka, PostgresQL
Tools and Packages	Git, AWS, Pandas, Numpy, Jupyter, Matplotlib, Keras, Flask
Environment	Ubuntu, Windows
Languages	Native in English and Cantonese Chinese

Experience

Insight Data Engineering — Boston, MA
Fellow — June 2019 – Present

- Developed a data pipeline to analyze real time chat room traffic and sentiment of over 100 channels, highlighting media content with high audience participation, visualized using Matplotlib and Flask
- Optimized pipeline to process over 2000 messages per second with cloud computing using AWS EC2; data allocation by Kafka, database management by PostGresQL, and storage using AWS S3
- Deployed chat bot written in Java Script to ingest and save messages for data pipeline usage.
- Built classification model for chat room reaction utilizing python packages Pandas, Numpy, and Keras; capable of identifying disappointment, laughter, and questions from chat room messages

Massachusetts Institute of Technology, — Cambridge, MA
PhD Candidate — September 2013 – June 2019

- Characterized chemical details of intricate alkylaromatic pyrolysis system through computational generation of chemical mechanisms containing over 200 species, 4000 reactions
- Developed Reaction Mechanism Generator with peers, open-source freeware to characterize chemical behavior of chemical systems
- Developed methods of rapid and efficient estimation of unknown species thermochemistry and reaction rate coefficients using group additivity methods and decision trees, leveraging computational tools NumPy and Pandas
- Calculated training data for machine learning algorithm in reaction mechanism generator by quantum methods; 154 species thermochemistry and 28 rate constants calculated
- Achieved superior separation of hydrocarbons in alkylaromatic and petroleum related mixtures through development of 2-dimensional gas chromatography method, computationally projecting 1-dimensional gas chromatogram to produce a superior 2-diemsional separation

Massachusetts Institute of Technology, — Cambridge, MA
Teaching Assistant for Chemical Engineering Lab — December 2015 – May 2016

- Developed MATLAB program for students to analyze output of Ultrasonic Pulsed Doppler system, up to 1M datapoints analyzed using Fourier transform per hour in attempt to develop nanoparticle sizing technique
- Organized group of 3 students to conduct efficient data collection in sizing experiments.

University of Michigan — Ann Arbor, MI
Undergraduate Research Assistant — May 2011 – December 2012

- Improved isobutanol tolerance of E.coli to produce potent fuel source
- Introduced over 90 mutations to E.coli in multiplex method through use of mutagens in high transformation
- Designed multiplex screening method to identify mutations in polymerase chain reaction and gel electrophoresis with high efficiency

Education

PhD in Chemical Engineering, Massachusetts Institute of Technology (MIT) — June 2019, Cambridge, MA
BSE in Chemical Engineering, University of Michigan — December 2012, Ann Arbor, MI