Kehang Han

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA
PhD Candidate Aug 2012 - May 2018
Advisor: William Green

- Chemical Engineering and Computer Science
- Overall GPA: 4.9/5.0
- Key Courses: Artificial Intelligence, Computer Vision, Machine Learning, Numerical Methods

Tsinghua University, Beijing, China
Bachelor of Science Sep 2008 - Jul 2012

- Chemical and Biological Engineering
- Rank: 1/120

MACHINE LEARNING

Self-Evolving Molecular Property Estimator
Lead Developer May 2016 - May 2017

- Implemented learnable featurization for molecules via convolutional neural networks
- Designed scalable algorithms for processing data in million entries
- Reduced entralpy prediction error by a factor of 25 compared with traditional models
- Constructed self-evolving pipeline: user feedback, data generation, nightly-build and performance reporting

Amazon Product Review Summarizer (SRS, srs.mit.edu)
Lead Developer Mar 2016 - Sep 2016

- Led a team with 3 people at MIT
- Built an NLP web application (srs.mit.edu) in Python, Flask and MongoDB
- Constructed four-step pipeline:
  review scraping, aspect classification, sentiment scoring and front-end interaction
- Developed product-aspect classifiers using MaxEntropy and Word2Vec

DATA SCIENCE

Supply Chain Planner in Shell Oil, Hamburg, Germany
Data Science Intern Jun 2015 - Sep 2015
Supervisor: Marc Thomas

- Streamlined price data processing for supply chain optimization tool
- Created analysis and visualization tools using R for extreme scenario study

SOFTWARE DEVELOPMENT

Reaction Mechanism Generator (RMG, rmg.mit.edu)
Lead Developer   Jan 2013 - Present

- Led a team with 10 people at MIT and Northeastern University
- Applied high performance computing (memory reduction, parallelism) to RMG
- Maintained cross-platform (Linux, OSX, Windows) compatibility
- Constructed Continuous Integration Test Platform (RMG-tests) for RMG

PROtein Design Algorithm (PRODA)
Developer   Sep 2011 - Jul 2012

- Development team member of PRODA, a software for designing protein using C
- Designed and implemented a heuristic optimization algorithm for MILP
- Achieved 20 times speed-up for large enzyme systems

WEB EXPERIENCE

MIT Sidney-Pacific Website (s-p.mit.edu)
Web Chair   Apr 2016 - Present
Sidney-Pacific website is an MIT dorm website that has integrated many residential services, which include automatic campus shuttle tracking, smart laundry reminder, inventory management and analysis system, real-time package notifications, house repairing and dorm events publicizing, etc.

- Major developer for the website written in PHP and SQL
- Developed resident package management system
- Automated inventory check-in-out, usage analysis and reporting system

AWARDS HONORS

Energy Analytics
- MIT Energy Initiative (MITEI) Fellowship in 2016
- 3rd Prize (3/30 teams) of MIT Energy Hackathon in 2015
- 3rd/300+ in Mitsui Chemicals Cup Process Design Contest in 2011

Mathematics
- 2nd Prize in American Mathematical Contest in Modeling in 2011
- 1st Prize in Chinese National Mathematical Contest in Modeling in 2010

Physics & Chemistry
- 1st Prize in Beijing Physics Contest in 2009
- 1st Prize in Chinese National Olympic Chemistry Competition in 2007

SELECTED PUBLICATIONS

- **K. Han**, W.H. Green, and R.H. West, *On-the-fly pruning for rate-based reaction mechanism generation*, Computers & Chemical Engineering
- X. Huang, **K. Han**, and Y. Zhu, *Systematic optimization model and algorithm for binding sequence selection in computational enzyme design*, Protein Science
- Y. Zhang, **K. Han**, D. Lu, and Z. Liu, *Reversible encapsulation of lysozyme within mPEG-b-PMAA: experimental observation and molecular dynamics simulation*, Soft Matter

SKILLS

Languages: Python, C/C++, Java, R, Matlab, PHP
Database: SQL, mongoDB
Design: Illustrator, Lightroom, Photoshop
Others: AWS, server admin