Chenghao Ding

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EDUCATION

University of Illinois at Urbana-Champaign August 16-Present
Ph.D Student in Nuclear Engineering GPA: 3.50/4.00

- Relevant coursework: Advanced Risk Analysis, Radiological Imaging, Interact of Radiation with Matter, Radiation Protection, Fundamental Plasma Materials Interactions, Materials in Nuclear Engineering, Fundamentals of Nuclear Engineering

Master student in Statistics January 19-Present

- Relevant coursework: Statistics and Probability II, Applied Regression and Design, Sampling and Categorical Data, Time Series Analysis, Statistical Data Management, Statistical Learning, Multivariate Analysis, Statistical Learning in Data Science

Master in Nuclear Engineering (Completed) August 16-December 18
Thesis Title: Global Heat Balance Without and With Solar Radiation Management
Advisor: Professor Clifford Singer

Wuhan University September 13–June 15
Master of Science in Power Engineering GPA: 3.62/4.00
Thesis Title: Study of Thermal Properties of Metastable Lennard-Jones Fluid

Hubei University of Science and Technology September 09–June 13
Bachelor of Science in Nuclear Power Engineering GPA: 3.75/4.00

WORK EXPERIENCE

Program in Arm Control & Domestic and International Security Urbana, IL
Graduate Research Assistant May 18-Present

- Involved in the Climate Action Policies and International Policy Negotiations Focal Point Project.
- Performed simulation of Climate Action Gaming Experiment
- Evaluated global heat balance without and with solar radiation management
- Calibrate natural variabilities in global heat balance model such as volcanoes, ENSO, and solar radiation
- Calibrate the global cooling effects resulted from nuclear winter

Energy Systems Program Urbana, IL
Graduate Teaching Assistant August 17-May 18

- Involved in the development of new material for department courses
- Organized and facilitated classroom lessons, activities, and presentations
- Evaluated homework, tests, and field work and held office hours to ensure students understood course concepts

Socio-Technical Risk Analysis (SoTeRiA) Laboratory Urbana, IL
Graduate Research Assistant August 16-July 17

- Optimized Global Importance Measures to perform sensitivity analysis for LOCA scenarios caused by Stress Corrosion Cracking in as part of the GSI-191 project
- Researched on Sensitivity Analysis and Uncertainty Quantification for Integrated PRA techniques
- Researched on the integration of Risk-Informed Decision Making with Importance Measure Achievements
- Devised convergence study of Latin hypercube sampling (LHS) and Crude Monte-Carlo sampling

China Energy Engineering Corporation Limited Changsha, China
Assistant Engineer July 15-October 15

- On-the-Job Training: System, Operation and Field Apparatus Maintenance
- Reviewed on long-term planning and management of Hunan Province's Power Industry, including fossil fuel power, nuclear power, and wind power
- Conducted draft design of the Power Plant of Changde II

Multi-scale Simulation Center Wuhan, China
Graduate Research Assistant September 14-June 15

- Studied Thermal Properties of the Metastable Lennard-Jones Fluid
- Researched in meso-scale dispersion process of radionuclides

State Nuclear Power Engineering Company (Internship) Haiyang, China
Participant April 14

- Attended nuclear power plant safety seminar
- Observed construction site of Haiyang nuclear reactor, and learned about the advanced passive system of AP1000

Institute of Nuclear Power Operation (Internship) Wuhan, China
Research Intern October 12-January 13

- Developed modules under the RINSIM environment, integrated with RELAP5 and MELCOR
- Developed a simplified heat exchanger module for a full scope simulator

PUBLICATION

W.C. Cheng, C. Ding, N. O'shea, T. Sakurahara, G. Schumock, Z. Mohaghegh, S. Reihani, E. Kee, "SPATIO-TEMPORAL PROBABILISTIC METHODOLOGY TO ESTIMATE LOCATION- SPECIFIC LOSS OF COOLANT ACCIDENT FREQUENCIES: GLOBAL SENSITIVITY ANALYSIS TO RANK PARAMETERS OF STRESS CORROSION CRACKING", A Full Paper Submitted to 2017 International Topical Meeting on Probabilistic Safety Assessment and Analysis (PSA 2017), September 2017, Pittsburgh, PA.

ACADEMIC PROJECTS

Movie Reviews Sentiment Analysis and Topic Modeling May 19

- Keras is used to build a convolutional neural networks (CNN) to analyze the sentiment score of Kaggle large movie review datasets
- Compared with the naive bayse model and stochastic gradient descent model, a higher prediction accuracy was achieved
- Analyze bias and variance trade off in the CNN model, and tune the hyperparameters by cross validation to improve the CNN model's prediction accuracy
- Latent Dirichlet allocation (LDA) method is used to extract the three most correlated topics and the 25 most frequent key words in each topic are found

CNN for Object Recognition in Images (case study on Fashion MNIST dataset) March 19

- 60,000 images are loaded and split into training and testing datasets
- One-hot coding is used for category labels, and a two-layer CNN model is built by Keras and 97.99% test accuracy is achieved
- Tuning hyperparameters with skopt, the best learning rate, filter size of the convolutional layer and the number of dense layer are found
- Test accuracy was improved to 98.36% and loss function converged quickly

Build a recommendation system on MovieLens 100K Dataset April 19

- Singular Value decomposition (SVD) method is used to build the recommend system
- 5 fold cross-validation for training and testing are computed, and the average root mean square error (RMSE) are reported
- The prediction scores for test users are given, and missing rating pattern are inspected

Thermal Properties of Metastable Lennard-Jones Fluid December 13-June 15

- Programmed using LAMMPS codes, and computed via the high-performance computing cluster
- Studied thermal properties of metastable fluid by MATLAB and VMD
- Improved the equation of state of Lennard-Jones fluid in the metastable region, and calculated nucleation rate of Lennard-Jones fluid

Building a Linux-Based High-performance Compute Cluster Wuhan, China
Leader September 13-November 13

- Directed install scheme of the cluster computer and hardware setup
- Administered the high-performance computing cluster

SKILLS

- Programing Language: Python(Proficient), Keras(Proficient), R(Proficient), Matlab, SQL, SAS
- Operating System: Linux (LinuxMint), Windows, MacOS
- Software: R, Matlab, Mathematica, AutoCAD, LaTeX, ArcGIS, RISKMAN, LAMMPS, RELAP5
- Language: Mandarin (Native), English (Fluent)
- Other: Hardware Architecting, Cluster Architecting

HONORS

- Outstanding Student, Hubei University of Science and Technology (TOP 5%) May 13
- Outstanding Student Cadre, Wuhan University (TOP 15%) January 1