Ruoqian (Rosanne) Liu *rosanne@geometric.ai*

+1 (734) 709-0985 • http://users.eecs.northwestern.edu/~rll943/

1250 S Michigan Ave • Chicago, IL 60605

Education

Northwestern University   EVANSTON, IL, USA
    Ph.D. in Computer Engineering   *2012 – 2016*
        Advisor: Prof. Alok Choudhary, GPA: 3.88

    Thesis title: Multi-Contextual Representation and Learning with Applications in Materials Knowledge Discovery

University of Michigan   DEARBORN, MI, USA
    Ph.D Candidate in Electrical Engineering (discontinued)   *2009 – 2012*
        Advisor: Prof. Yi Lu Murphey, GPA: 3.97

University of Michigan   DEARBORN, MI, USA
    Master of Science in Electrical Engineering   *2007 – 2009*
        Advisor: Prof. Yi Lu Murphey, GPA: 3.92

    Thesis title: Neural Ensemble Learning with Application to Vehicle Fault Diagnostics

Fudan University   SHANGHAI, CHINA
    Bachelor of Science in Electrical Engineering   *2003 – 2007*

Awards and Fellowships

- Best presentation, Deep Learning Workshop, KDD, August 2016.
- Second place, Student Poster Fair Award, McCormick Engineering School, Northwestern University, 2015.
- Northwestern Graduate School Conference Travel Grant (KDD 2015, KDD 2016)
- Second place, poster competition at the Symposium of Multidisciplinary Computer-Aided Design and Simulation-Based Optimization - Recent Applications & Future, Evanston IL, December 2014.
- Best paper, ASME 2014 International Design Engineering Technical Conferences, Computers and Information in Engineering Conference, IDETC2014-34570, August 2014.
- ATPESC (Argonne Training Program on Extreme-Scale Computing) Award, Argonne National Laboratory, 2014.
- Predictive Science and Engineering Design (PS&ED) Fellowship, 2013-2014.
- Broadening Participation in Data Mining (BPDM) Scholarship, 2013.
- PhD research grants from "MURI: MANAGING THE MOSAIC OF MICROSTRUCTURE: Image analysis, data structures, mathematical theory of microstructure, and hardware for the structure-property relationship", Air Force Office of Scientific Research (AFOSR), Department of Defense (DOD), 2012-2017; also from "Advanced Materials Center for Excellence: Center for Hierarchical Materials Design (CHiMaD)", National Institute of Standards and Technology (NIST), 2014-2019.
- First place, Kaggle Competition on Driving Alertness Detection, 2011.
- People's college scholarship, 2004, 2005, 2006.

Work Experience

Geometric Intelligence   NEW YORK, NY, USA

Machine Learning Researcher   *Jul '16 – present*

Work in a research startup developing general-purpose, novel artificial intelligence solutions on natural images and languages.

Northwestern University   EVANSTON, IL, USA

Research Assistant, CUCIS   *Sep '12 – present*

A series of projects that involve building predictive models for descriptive and explanatory purposes in scientific applications, in various scopes as materials science, social science, finance, and meteorology.

Teaching Assistant   *Fall '14, Spring '15*

Worked as the only teaching assistant for undergraduate discrete math course containing 80+ students. Also as co-instructor for graduate-level social media mining seminar course, giving lectures as "data mining essentials" and "introduction to deep learning".

Ford Motor Company   DEARBORN, MI, USA

Research Intern   *May '11 – Sep '11, May '12 – Sep '12*

Worked at the Hybrid Electric Vehicle Intelligent Control research center for two consecutive summers; developed prediction systems for optimal torque distribution for vehicle handling maneuvers. Published research papers and filed patents.

University of Michigan-Dearborn   DEARBORN, MI, USA

Research Assistant   *Sep '07 – Apr '12*

Deployed learning algorithms in vehicle simulation systems, mostly involving the use of neural networks and ensemble learning for the purposes of vehicle dynamic control, power management, driver awareness detection, and trip modeling.

Teaching Assistant   *Fall '11, Spring '12*

Lab instructor for undergraduate *Control Theories* class for two semesters.

Publications

1. **R. Liu**, A. Agrawal, W. Liao, M. De Graef, and A. Choudhary, "Materials Discovery: Understanding Polycrystals from Large-Scale Electron Patterns", In 3rd Workshop on Advances in Software and Hardware for Big Data to Knowledge Discovery (ASH), held in conjunction with 2016 IEEE Conference on Big Data (BigData), December 2016.

2. **R. Liu**, D. Palsetia, A. Paul, R. Al-Bahrani, D. Jha, W. Liao, A. Agrawal, and A. Choudhary, "PinterNet: A Thematic Label Curation Tool for Large Image Datasets", In 1st Workshop on Open Science in Big Data (OSBD), held in conjunction with 2016 IEEE Conference on Big Data (BigData), December 2016.

3. **R. Liu**, L. Ward, A. Agrawal, W. Liao, C. Wolverton, and A. Choudhary. "Deep Learning for Chemical Compound Stability Prediction," In Proceedings of the Workshop on Large-scale Deep Learning for Data Mining, held in conjunction with the SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), August 2016.

4. **R. Liu**, Y. C. Yabansu, A. Agrawal, S. R. Kalidindi, and A. Choudhary, "Machine learning approaches for elastic localization linkages in high-contrast composite materials," Integrating Materials and Manufacturing Innovation (IMMI), vol. 4, no. 13, pp. 1–17, 2015.

5. **R. Liu**, A. Agrawal, Z. Chen, W. Liao, and A. Choudhary, "Pruned Search: A Machine Learning Based Meta-Heuristic Approach for Constrained Continuous Optimization," 2015 International Conference on Contemporary Computing (IC3), August 2015.

6. **R. Liu**, A. Kumar, Z. Chen, A. Agrawal, V. Sundararaghavan, and A. Choudhary, "A Predictive Machine Learning Approach for Microstructure Optimization and Materials Design," *Nature Scientific Reports*, 5, 11551; doi: 10.1038/srep11551. 2015.

7. H. Xu, **R. Liu**, A. Choudhary, and W. Chen, "A Machine Learning-Based Design Representation Method for Designing Heterogeneous Microstructures," *Journal of Mechanical Design*, 137(5):051403-051403, ASME, May 2015.

8. C. Jin, **R. Liu**, Z. Chen, W. Hendrix, A. Agrawal, and A. Choudhary, "A Scalable Hierarchical Clustering Algorithm Using Spark," In *Proceedings of The IEEE International Conference on Big Data Computing and Applications (BigDataService 2015)*, San Francisco Bay, USA, March 2015.

9. **R. Liu**, and A. Agrawal, W. Liao, and A. Choudhary, "Search Space Preprocessing in Solving Complex Optimization Problems," In *Proceedings of the IEEE International Conference on Big Data*, October 2014.

10. **R. Liu**, and A. Agrawal, W. Liao, and A. Choudhary, "Enhancing Financial Decision-Making Using Social Behavior Modeling," In *Proceedings of the 8th Workshop on Social Network Mining and Analysis*, August 2014.

11. H. Xu, **R. Liu**, A. Choudhary, and W. Chen, "A Machine Learning-Based Design Representation Method for Designing Heterogeneous Microstructures," In *the ASME International Design Engineering Technical Conferences*, August 2014. **Best Paper Award.**

12. **R. Liu**, Z. Chen, T. Fast, S. Kalidindi, A. Agrawal, and A. Choudhary, "Predictive Modeling in Characterizing Localization Relationships," In *the TMS Annual Meeting & Exhibition, Symposium of Data Analytics for Materials Science and Manufacturing*, February 2014.

13. **R. Liu**, A. Kumar, Z. Chen, A. Agrawal, V. Sundararaghavan, and A. Choudhary, "A Data Mining Approach in Structure-Property Optimization," In *the TMS Annual Meeting & Exhibition, Symposium of Data Analytics for Materials Science and Manufacturing*, February 2014.

14. **R. Liu**, S. Xu, C. Fang, Y. Liu, Y. Murphey, and D.S. Kochhar, "Statistical Modeling and Signal Selection in Multivariate Time Series Pattern Classification," In *21st International Conference on Pattern Recognition (ICPR)*, pp.2853–2856, 11–15 November 2012.

15. **R. Liu**, H. Yu, R. McGee, and Y. Murphey, "Driving Course Prediction for Vehicle Handling Maneuvers," In *American Control Conference (ACC)*, pp.2096–2101, 27–29 June 2012.

16. S. Xu, **R. Liu**, D. Li, and Y. Murphey, "A Hybrid System Ensemble Based Time Series Signal Classification on Driver Alertness Detection," In *The 2011 International Joint Conference on Neural Networks (IJCNN)*, pp.2093–2099, July 31 2011–August 5, 2011.

17. **R. Liu**, S. Xu, J. Park, Y. Murphey, J. Kristinsson, R. McGee, M. Kuang, and T. Phillips, "Real Time Vehicle Speed Prediction Using Gas-Kinetic Traffic Modeling," In *2011 IEEE Symposium on Computational Intelligence in Vehicles and Transportation Systems (CIVTS)*. pp.80–86, 11–15 April 2011.

18. **R. Liu**, and Y. Murphey, "Time-series Temporal Classification Using Feature Ensemble Learning," In *the 2010 International Joint Conference on Neural Networks (IJCNN)*. pp.1–5, 18–23 July 2010.

Service

Reviewer for conferences:

- IEEE International Conference on Big Data (BigData) 2016
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2016
- IEEE International Conference on Big Data (BigData) 2015
- IEEE International Conference on Data Mining (ICDM) 2015
- IEEE International Conference on Systems, Man, Cybernetics (SMC) 2015
- IEEE International Conference on Data Mining (ICDM) 2014
- ACM International Conference on Information and Knowledge Management (CIKM) 2013
- International Joint Conference on Neural Networks (IJCNN) 2012
- International Joint Conference on Neural Networks (IJCNN) 2011

Student volunteer:

- NIPS 2015
- KDD 2015
- IEEE Big Data 2015

Interests

Non-exhaustive and in alphabetical order: Art, cooking, dogs, literature, nutrition, open source, piano, swimming, tennis, and typography (e.g. graphic design, LaTeX, Beamer).