Rosanne Liu *mimosavvy@gmail.com*

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Bio (more versions at rosanneliu.com/bio)

Rosanne is a research scientist and manager at Google DeepMind (previously Brain), and co-founder and executive director of ML Collective, a non-profit organization providing research training for all. She was also a founding member of Uber AI. She obtained her PhD in Computer Science at Northwestern University, published research at NeurIPS, ICLR, ICML, Science and other top venues, and had her work featured by WIRED, MIT Tech Review and Fortune. She builds communities for underrepresented and unprivileged researchers, organizes symposiums, workshops, and a weekly reading group "Deep Learning: Classics and Trends" since 2018. She serves as the Diversity, Equity & Inclusion chair of ICLR 2022-2024, and NeurIPS 2023.

Work Experience

Google DeepMind — San Francisco, CA, USA

Senior Research Scientist and Manager *Apr '21 – present*

Working on understanding deep learning on the path to AGI.

ML Collective

Co-founder & Executive Director *Jun '20 – present*

ML Collective is an independent nonprofit organization that facilitates open collaboration and free mentorship for machine learning research. More: mlcollective.org

Uber AI — San Francisco, CA, USA

Senior Research Scientist *Dec '16 – Jun '20*

Founding member of Uber AI. We conduct fundamental research in deep learning, as well as collaborate with partner teams on perception, prediction, self-driving, etc.

Geometric Intelligence — New York, NY, USA

Machine Learning Researcher *Apr '16 – Dec '16*

Key member in a research startup developing general-purpose, novel artificial intelligence solutions. Acquired by Uber.

Northwestern University — Evanston, IL, USA

Research Assistant, CUCIS *Sep '12 – Apr '16*

Led 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; well received lectures include "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.

Media, Awards and Fellowships

- Mozilla MIECO award, 2022-2023 cohort
- Named as **30 under 30 Rising Stars in AI**.
- Named as **30 Influential Women Advancing AI in San Francisco**.
- PPLM featured in VentureBeat, MIT Tech Review, NewsDio, MarkeTechPost, Jambon-Burst, QQ Weixin, InfoQ, AIM, and others.
- Blog article on plug and play language models, December 2019. https://eng.uber.com/pplm/
- Blog article on loss change allocation, September 2019. https://eng.uber.com/loss-change-allocation/
- Blog article on deconstructing lottery tickets, May 2019. https://eng.uber.com/deconstructing-lottery-tickets/
- Media coverage: "How Uber AI Labs used filters to fix a ConvNets deficiency"
- Blog article on organizing 1st Uber Science Symposium, February 2019. http://eng.uber.com/uber-science-symposium-2018
- Blog article on Atari Zoo of reinforcement learning algorithms, January 2019. https://eng.uber.com/atari-zoo-deep-reinforcement-learning
- Blog article on invited talk at Moving the World With Data, December 2018. https://eng.uber.com/women-in-data-science
- Blog article on Fast Neural Networks Straight from JPEG, December 2018. https://eng.uber.com/neural-networks-jpeg
- Blog article on research improving Convolutional Neural Networks, July 2018. https://eng.uber.com/coordconv
- Featured article on measuring the intrinsic dimensions of neural networks, April 2018. https://eng.uber.com/intrinsic-dimension
- Invited speaker, ReWork Women in AI Dinner, June 2018. https://www.re-work.co/events/women-in-ai-dinner-san-francisco-june-2018
- 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.

Publications

(Google Scholar; DBLP)

1. *Gemini 1.5: Unlocking multimodal understanding across millions of tokens of context.* arXiv 2024.
2. *Beyond human data: Scaling self-training for problem-solving with language models.* arXiv 2023.
3. **R. Liu***, D. Garrette*, C. Saharia, W. Chan, A. Roberts, S. Narang, I. Blok, RJ Mical, M. Norouzi, N. Constant*. *Character-Aware Models Improve Visual Text Rendering.* arXiv 2022.
4. A. Djurisic, N. Bozanic, A. Ashok, **R. Liu**. *Extremely Simple Activation Shaping for Out-of-Distribution Detection.* arXiv 2022.
5. S. Pratt, **R. Liu**, A. Farhadi. *What does a platypus look like? Generating customized prompts for zero-shot image classification.* arXiv 2022.
6. (author list too large to display but **R. Liu** is somewhere) *Beyond the Imitation Game: Quantifying and extrapolating the capabilities of language models.* arXiv 2022.
7. R. Schirrmeister, **R. Liu**, S. Hooker, T. Ball. *When less is more: Simplifying inputs aids neural network understanding.* arXiv 2022.
8. F. Lau, N., S. Harrison, A. Kim, E. Branson, **R. Liu**. *Natural Adversarial Objects*. arXiv 2021.
9. G. Winata, A. Madotto, Z. Lin, **R. Liu**, J. Yosinski, P. Fung. *Language Models are Few-shot Multilingual Learners.* Workshop on Multilingual Representation Learning, EMNLP 2021.
10. S. Singh, **R. Liu**. *Why is Pruning at Initialization Immune to Reinitializing and Shuffling?* Sparsity in Neural Networks Workshop 2021.
11. N. Hu, X. Hu, **R. Liu**, S. Hooker, J. Yosinski. *When does loss-based prioritization fail?* Workshop on SubSetML, ICML 2021.
12. M. Wortsman, V. Ramanujan, **R. Liu**, A. Kembhavi, M. Rastegari, J. Yosinski, A. Farhadi. *Supermasks in Superposition*. Advances in Neural Information Processing Systems (**NeurIPS 2020**).
13. A. Edwards, H. Sahni, **R. Liu**, J. Hung, A. Jain, R. Wang, A. Ecoffet, T. Miconi, C. Isbell, and J. Yosinski. *Estimating Q(s,s') with Deep Deterministic Dynamics Gradients*. International Conference on Machine Learning (**ICML 2020**).
14. S. Dathathri, A. Madotto, J. Lan, J. Hung, E. Frank, P. Molino, J. Yosinski, and **R. Liu**. *Plug and play language models: a simple approach to controlled text generation*. In Proceedings of the International Conference on Learning Representations (**ICLR 2020**).
15. J. Lan, **R. Liu**, H. Zhou, and J. Yosinski. *LCA: Loss change allocation for neural network training*. Advances in Neural Information Processing Systems (**NeurIPS 2019**), 3614-3624, 2019.

16. H. Zhou, J. Lan, **R. Liu**, and J. Yosinski. *Deconstructing lottery tickets: Zeros, signs, and the supermask*. Advances in Neural Information Processing Systems (**NeurIPS 2019**), 3592-3602, 2019.
17. F. Such, V. Madhavan, **R. Liu**, R. Wang, P. Castro, Y. Li, J. Zhi, L. Schubert, M. G. Bellemare, J. Clune, and J. Lehman, 2019.*An Atari model zoo for analyzing, visualizing, and comparing deep reinforcement learning agents*. The 28th International Joint Conference on Artificial Intelligence (**IJCAI 2019**).
18. **R Liu**, J. Lehman, P. Molino, F. P. Such, E. Frank, A. Sergeev, and J. Yosinski, 2018. *An intriguing failing of convolutional neural networks and the CoordConv solution*. Advances in Neural Information Processing Systems (**NeurIPS 2018**).
19. L. Gueguen, A. Sergeev, B. Kadlec, **R. Liu**, J. Yosinski. *Faster neural networks straight from JPEG*. Advances in Neural Information Processing Systems (**NeurIPS 2018**).
20. C. Li, H. Farkhoor, **R. Liu**, and J. Yosinski, 2018. *Measuring the intrinsic dimension of objective landscapes*. In Proceedings of the International Conference on Learning Representations (**ICLR 2018**).
21. **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 2016**), December 2016.
22. **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 2016**), December 2016.
23. **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 2016**), August 2016.
24. **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.
25. **R. Liu**, A. Agrawal, Z. Chen, W. Liao, and A. Choudhary. *Pruned Search: A Machine Learning Based Meta-Heuristic Approach for Constrained Continuous Optimization*. International Conference on Contemporary Computing (IC3), August 2015.
26. **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.
27. 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.
28. 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.
29. **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 (**BigData 2014**), October 2014.

30. **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, held in conjunction with the SIGKDD Conferenceon Knowledge Discovery and Data Mining (**KDD 2014**), August 2014.
31. 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**.
32. **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.
33. **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.
34. **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 2012**), pp.2853–2856, 11–15 November 2012.
35. **R. Liu**, H. Yu, R. McGee, and Y. Murphey. *Driving Course Prediction for Vehicle Handling Maneuvers*. In American Control Conference (**ACC 2012**), pp.2096–2101, 27–29 June 2012.
36. 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 2011**)*, pp.2093–2099, July 31 2011–August 5, 2011.
37. **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.
38. **R. Liu**, and Y. Murphey. *Time-series Temporal Classification Using Feature Ensemble Learning*. In the 2010 International Joint Conference on Neural Networks (**IJCNN 2010**). pp.1–5, 18–23 July 2010.

Professional Services

Speaking:

- *A self-serving approach to living a good life as a researcher*, Keynote at Deep Learning Indaba, September 2023.
- *Career ~~choice~~ creation for non-standard candidates"*, Cohere For AI, December 2022.
- *I Love Academia and I Want It to Be Better: Efforts Charting New Territory in Science*, University of Michigan-Ann Arbor & University of Wisconsin-Madison, October 2022.
- *Collaborations in ML: Why Do We Even Care*, NewInML Workshop @ ICML 2022, July 2022.
- *AI research: The unreasonably narrow path and how not to be miserable*, Google, October 2020.
- *Bad Assumptions about Neural Networks*, SignalFire, March 2020.

- *How to have fun in AI research*, Women in AI event hosted at South Park Commons, February 2020.
- (**Keynote)** Auto.AI, February 2020.
- *Controlling Text Generation with Plug and Play Language Models*, Primer AI, January 2020.
- (**Keynote)** Machine Learning Summit, co-located with Linux Foundation Open Source Summit, August 2019
- (**Guest lecturer**) Applied Deep Learning, OpenAI and Weights & Biases, June 2019
- ReWork Women in AI Dinner, June 2018

Organizing:

- Broadening Research Collaborations in ML, NeurIPS 2022
- Bay Area Efficient ML Poster Session, 2022
- CoSubmitting Summer (CSS) Workshop, ICLR 2022
- Workshop on Computational Approaches to Mental Health, ICML 2021
- "Open Collaborative in ML Research" Social, ICLR 2021
- "Open Collaborative in ML Research" Social, NeurIPS 2020
- ML Retrospective Workshop, ICML 2020
- 1st Uber Science Symposium, Deep Learning track. `http://eng.uber.com/uber-science-symposium-2018`

Academic services:

- Area Chair, NeurIPS 2023
- DIA Co-Chair, NeurIPS 2023
- Area Chair, ICLR 2023
- DEI Co-Chair, ICLR 2022-2024 (3 consecutive years)
- Reviewer, NeurIPS 2017-2020
- Reviewer, ICML 2018
- Reviewer, IEEE International Conference on Big Data (BigData) 2015-2016
- Reviewer, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2016
- Reviewer, IEEE International Conference on Data Mining (ICDM) 2015
- Reviewer, IEEE International Conference on Systems, Man, Cybernetics (SMC) 2015
- Reviewer, IEEE International Conference on Data Mining (ICDM) 2014
- Reviewer, ACM International Conference on Information and Knowledge Management (CIKM) 2013
- Reviewer, International Joint Conference on Neural Networks (IJCNN) 2012
- Reviewer, International Joint Conference on Neural Networks (IJCNN) 2011

Education

Northwestern University — Evanston, IL, USA

Ph.D. in Computer Science — *2012 – 2016*

Advisor: Prof. Alok Choudhary, GPA: 3.88

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

University of Michigan — Dearborn, MI, USA

Master of Science in Computer Science — *2007 – 2009*

Advisor: Prof. Yi Lu Murphey, GPA: 3.92

Thesis: Neural Ensemble Learning with Application to Vehicle Fault Diagnostics

Fudan University — Shanghai, China

Bachelor of Science in Electrical Engineering — *2003 – 2007*

References

Zoubin Ghahramani — zoubin@gmail.com

Ken Stanley — kennethostanley@gmail.com

Jason Yosinski — jason@yosinski.com