Qi (Rose) Yu

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RESEARCH

Spatiotemporal Machine Learning, Deep Learning, Tensor Methods, and their applications.

CURRENT APPOINTMENT

University of California, San Diego, La Jolla, California
Assistant Professor, Department of Computer Science and Engineering, July 2020 - Present
Halıcıoğlu Data Science Institute

PREVIOUS APPOINTMENT

Northeastern University, Boston, Massachusetts
Assistant Professor, Khoury College of Computer Sciences Aug 2018 - June 2020
Network Science Institute, College of Engineering, Physics (By Courtesy)

California Institute of Technology, Pasadena, California
Postdoctoral Scholar, Computing + Mathematical Sciences Aug 2017 - Aug 2018
- Advisors: Anima Anandkumar, Yisong Yue

Stanford University, Palo Alto, California
Visiting Researcher, Computer Science Department Aug 2016 - Oct 2016
- Host: Christopher Ré

IBM Research, Yorktown Heights, New York
Research Intern June 2015 - Aug 2015

Yahoo! Labs, Sunnyvale, California
Research Intern June 2014 - Aug 2014

Intel Lab, Santa Clara, California
Research Intern May 2013 - Aug 2013

Microsoft R&D, Minghang, Shanghai
Program Manager Intern June 2011 - June 2012

EDUCATION

University of Southern California, Los Angeles, California
Ph.D., Computer Science, Computer Science Department Aug 2012 - Aug 2017
Thesis: Tensor Learning for Large-Scale Spatiotemporal Analysis
Finalist in William F. Ballhaus, Jr. Prize for Excellence in Graduate Engineering Research
- Advisors: Yan Liu, Cyrus Shahabi

Zhejiang University, Hangzhou, Zhejiang, PRC
B.S in Computer Science, Chu Kochen Honors College Aug 2008 - June 2012
- Advisor: Zhihua Zhang

SELECTED AWARDS AND HONORS

Outstanding Faculty Researcher Award, JPMorgan, July 2021

Facebook Data Science Research Awards, Facebook Research, June 2021

Google Cloud Research Innovators, Google Cloud, March 2021

AWS Machine Learning Research Awards, Amazon Science, Feb 2021

Best Paper Award, NeurIPS Machine Learning for Public Health, Dec 2020

Adobe Data Science Research Awards, Adobe Research, March 2020

Google Faculty Research Award, Google Research, Feb 2020

Best Dissertation Award, University of Southern California, 2018

Best Paper Award, NIPS Time Series Workshop, 2017

SIGKDD Scholarship, ACM 50th Celebration of the Turing Award, San Francisco, 2017

Rising Stars in EECS, 40 Awardees in North America, MIT, 2015

Annenberg Graduate Fellowship, University of Southern California, 2012

Selected in ACM Heidelberg Laureate Forum , University of Heidelberg, 2013

Microsoft 2011 Young Fellowship, Microsoft Research Asia, 2011

International Forum (iF) Design Hanover Global Concept Award, iF, 2010

First prize in Undergraduate Research and Innovation, Zhejiang University, 2010

Conference Publications

[C1] Zihao Zhou, Xingyi Yang, Ryan Rossi, Handong Zhao, Rose Yu. "Neural Point Process for Learning Spatiotemporal Event Dynamics" To Appear in *Annual Conference on Learning for Dynamics and Control* (L4DC), 2022

[C2] Alejandro Rodriguez Pascual, Ishan Mehta, Muhammad Khan, Frank Rodriz, Rose Yu. "Understanding why shooters shoot - An AI-powered engine for basketball performance profiling" MIT Sloan Sports Analytics Conference (SSAC), 2022

[C3] Nima Dehmamy, Robin Walters, Yanchen Liu, Dashun Wang, Rose Yu. "Automatic Symmetry Discovery with Lie Algebra Convolutional Network" In Proceedings of *Advances in Neural Information Processing Systems* (NeurIPS), 2021

[C4] Dongxia Wu, Liyao Gao, Xinyue Xiong, Matteo Chinazzi, Alessandro Vespignani, Yi-An Ma, Rose Yu. "Quantifying Uncertainty in Deep Spatiotemporal Forecasting" In Proceedings of *ACM SIGKDD Conference on Knowledge Discovery and Data Mining* (KDD), 2021

[C5] Rui Wang, Danielle Maddix, Christos Faloutsos, Yuyang Wang, Rose Yu. "Bridging Physics-based and Data-driven modeling for Learning Dynamical Systems", In Proceeding of *Annual Conference on Learning for Dynamics and Control* (L4DC), 2021

[C6] Steven Wong, Lejun Jiang, Robin Walters, Tamás G. Molnár, Gábor Orosz, Rose Yu. "Physics-Guided Deep Learning for Traffic Forecasting using Vehicle-to-Vehicle Communication" In Proceeding of *Annual Conference on Learning for Dynamics and Control* (L4DC), 2021

[C7] Robin Walters, Jinxi (Leo) Li, Rose Yu. "Trajectory Prediction using Equivariant Continuous Convolution", In Proceeding of *International Conference on Learning Representations* (ICLR), 2021

[C8] Rui Wang, Robin Walters, Rose Yu. "Incorporating Symmetry into Deep Dynamics Models for Improved Generalization", In Proceeding of *International Conference on Learning Representations* (ICLR), 2021

[C9] Fan Xie, Alex Chowdhury, Clara De Paolis, Linfeng Zhao, Lawson Wong, Rose Yu. "Deep Imitation Learning for Bimanual Robotic Manipulation" In Proceeding of *Advances in Neural Information Processing Systems* (NeurIPS), 2020

[C10] Armand Comas Massague, Chi Zhang, Zlatan Feric, Octavia Camps, Rose Yu. "Learning Disentangled Representations of Video with Missing Data" In Proceeding of *Advances in Neural Information Processing Systems* (NeurIPS), 2020

[C11] Jung Yeon Park, Kenneth Theo Carr, Stephan Zheng, Yisong Yue, Rose Yu "Multiresolution Tensor Learning for Efficient and Interpretable Spatial Analysis" In Proceedings of *the 32th International Conference on Machine Learning* (ICML), 2020

[C12] Chintan Shah, Nima Dehmamy, Nicola Perra, Matteo Chinazzi, Albert-László Barabási, Alessandro Vespignani, Rose Yu. "Finding Patient Zero: Learning Contagion Source with Graph Neural Networks" In *International Conference on Network Science* (NetSci), 2020.

[C13] Csaba Both, Nima Dehmamy, Albert-László Barabási, Rose Yu. "Network Layout using Graph Neural Networks" In *International Conference on Network Science* (NetSci), 2020.

[C14] Rui Wang, Adrian Albert, Karthik, Kashinath, Mustafa, Mustafa, Rose Yu. "Towards Physics-informed Deep Learning for Spatiotemporal Modeling of Turbulent Flows", In Proceeding of *ACM SIGKDD Conference on Knowledge Discovery and Data Mining* (KDD), 2020

[C15] Eliza Huang, Rui Wang, Uma Chandrasekaran, Rose Yu. "Aortic Pressure Forecasting with Deep Sequence Learning", In Proceeding of *Computing in Cardiology* (CinC), 2020

[C16] Nima Dehmamy, Albert-László Barabási, Rose Yu. "Understanding the Representation Power of Graph Neural Networks in Learning Graph Topology" In Proceeding of *Advances in Neural Information Processing Systems* (NeurIPS), 2019

[C17] Yukai Liu, Rose Yu, Stephan Zheng, Eric Zhan, Yisong Yue. "NAOMI: Non-Autoregressive Multiresolution Sequence Imputation" In Proceeding of *Advances in Neural Information Processing Systems* (NeurIPS), 2019

[C18] Guanya Shi, Xichen Shi, Michael O'Connell, Rose Yu, Kamyar Azizzadenesheli, Anima Anandkumar, Yisong Yue, Soon-Jo Chung. "Neural Lander: Stable Drone Landing Control using Learned Dynamics" In Proceedings of *International Conference on Robotics and Automation* (ICRA), 2019

[C19] Yaguang Li, Rose Yu, Cyrus Shahabi, Yan Liu. "Diffusion Convolutional Recurrent Neural Network: Data-Driven Traffic Forecasting" In Proceedings of *International Conference on Learning Representations*(ICLR), 2018

[C20] Rose Yu, Guangyu Li, Yan Liu. "Tensor regression meets Gaussian Processes." In Proceedings of *International Conference on Artificial Intelligence and Statistics* (AISTATS), 2018

[C21] Rose Yu, Yaguang Li, Ugur Demiryurek, Cyrus Shahabi, Yan Liu. "Deep Learning: A Generic Approach for Extreme Condition Traffic Forecasting." In Proceedings of *the Seventeenth SIAM International Conference on Data Mining* (SDM), 2017

[C22] Rose Yu, Yan Liu. "Learning from Multiway Data: Simple and Efficient Tensor Regression." In Proceedings of *International Conference on Machine Learning* (ICML), 2016

[C23] Dingxiong Deng, Cyrus Shahabi, Ugur Demiryurek, Linhong Zhu, Rose Yu, Yan Liu, "Latent Space Model for Road Networks to Predict Time-Varying Traffic", In Proceeding of *ACM SIGKDD Conference on Knowledge Discovery and Data Mining* (KDD), 2016

[C24] Rose Yu, Andrew Gelfand, Suju Rajan, Cyrus Shahabi, Yan Liu. "Geographic Segmentation via Latent Poisson Factor Model." In *ACM International Conference on Web Search and Data Mining* (WSDM), 2016

[C25] Rose Yu, Dehua Cheng, Yan Liu. "Accelerated Online Low Rank Tensor Learning for Multivariate Spatiotemporal Streams." In Proceedings of *International Conference on Machine Learning* (ICML), 2015

[C26] Rose Yu, Mohammad Taha Bahadori, Yan Liu. "Fast Multivariate Spatio-temporal Analysis via Low Rank Tensor Learning." In Proceeding of *Advances in Neural Information Processing Systems* (NIPS), 2014 **Spotlight**

[C27] Rose Yu, Xinran He, Yan Liu. "GLAD: Group Anomaly Detection in Social Media Analysis." In Proceeding of *ACM SIGKDD Conference on Knowledge Discovery and Data Mining* (KDD), 2014

[C28] Cuixia Gao, Naiyan Wang,Qi Yu, Zhihua Zhang. "A Feasible Nonconvex Relaxation Approach to Feature Selection." In *Proceeding of 24th AAAI Conference on Artificial Intelligence* (AAAI), 2011

Journal Publications

[J1] Cramer, E.Y., Lopez, V.K., Niemi, J., George, G.E., Cegan, J.C., Dettwiller, I.D., England, W.P., Farthing, M.W., Hunter, R.H., Lafferty, B. and Linkov, I., 2021. Evaluation of individual and ensemble probabilistic forecasts of COVID-19 mortality in the US. In *Proceedings of the National Academy of Sciences* (PNAS), 2022

[J2] K. Kashinath, M. Mustafa, A. Albert,J-L. Wu, C. Jiang, S. Esmaeilzadeh ,K. Azizzadenesheli, R. Wang, A.Singh, A. Manepalli, D. Chirila, R.Yu, R. Walters, B. White, H. Xiao, H. A. Tchelepi, P. Marcus, A. Anandkumar, Prabhat. "Physics-informed machine learning: Case studies for weather and climate modelling" In *Journal of Philosophical Transactions of the Royal Society A*, 2020

[J3] Rose Yu, Stephan Zheng, Anima Anandkumar, Yisong Yue. "Long Term Forecasting with Higher Order Tensor RNN". In *Journal of Machine Learning Research* (JMLR), 2018

[J4] Rose Yu, Yan Liu. "Spatio-Temporal Analysis of Social Media Data" In *Encyclopedia of GIS*, 2016

[J5] Rose Yu, Huida Qiu, Zhen Wen, Ching-Yung Liu, Yan Liu. "A Survey on Social Media Analysis Anomaly Detection" In *ACM KDD Exploration*, 2016

[J6] Rose Yu, Xinran He, Yan Liu. "GLAD: Group Anomaly Detection in Social Media Analysis - Extended Abstract." In ACM Transactions on Knowledge Discovery in Data (TKDD), 2015

Advising

Postdocs Supervised

- Jedrzej (Jacob) Kozerawski, 2021, active
- Robin Walters, 2020 - 2022 Assistant Professor, Northeastern University

Ph.D. Students Advised

- Sophia Sun, 2021, active
- Bo Zhao, 2021, active
- Dongxia (Allen) Wu, 2020, active
- Rui (Ray) Wang, 2019, active
- Jung Yeon (John) Park, 2019 - 2020, advised at Northeastern
- Clara De Paolis, 2018 -2020, advised at Northeastern

Teaching

Deep Reinforcement Learning (CSE 291) Fall 2021

Deep Learning (CSE 151B) Spring 2021

Deep Generative Models (CSE 291(G00)) Fall 2020

Advanced Machine Learning (CS 7140) Spring 2020

Machine Learning Seminar (CS 4950) Fall 2019

Introduction to Computer Science Research (CS 3950) Fall 2019

Special Topics in AI: Deep Learning (CS 7180) Spring 2019

Machine Learning (CS 6140) Fall 2018

Academic Service

Conference Organizing Committee

Industry Expo Co-Chair, ICML (2022)
Poster Chair, KDD (2020)
Proceedings Chair, ACM SIGSPATIAL (2020)
KITP: At the Crossroad of Physics and Machine Learning, 2019
Proceedings Chair, WSDM (2018)
Short Paper Chair, CIKM (2017)

Workshop Co-organizer

ICML Time Series Workshop, (2021, 2019, 2017)
ICCV Simulation Technology for Embodied AI, 2021
ICLR Workshop on Deep Learning for Simulation (2021)
NeurIPS Workshop on Machine Learning for Engineering (2020)
NIPS Woman in Machine Learning Workshop (2016)
NIPS workshop on Learning with Tensors: Why Now and How? (2016)

Grant Reviewer/Panelist

Department of Energy (DOE) Review Panel (2020, 2019)
National Science Foundation (NSF) Review Panel (2022, 2021, 2019, 2018)

Senior Program Committee (or Area Chair)

ICML(2022, 2021, 2020), ICLR (2022, 2021), NeurIPS (2021, 2020), AAAI (2021), IJCAI (2020), SDM (2020)

Program Committee

ICML (2020, 2019, 2018), NeurIPS (2019, 2018), ICLR (2020, 2019), KDD (2019), AISTATS (2020, 2019), SDM (2019), AAAI (2018), IJCAI (2018), CIKM (2017), NIPS Time Series Workshop (2016), ICML Time Series Workshop (2016)

Reviewer AAAI 2021 Spring Symposium on Combining Machine Learning with Physical Sciences, Proceedings of IEEE (2019), Journal of Machine Learning Research (JMLR), Journal of Artificial Intelligence Research (JAIR), Transactions on Knowledge Discovery from Data (TKDD), IEEE Transactions on Knowledge and Data Engineering (TKDE), IEEE Intelligent Transportation Systems Transaction (ITS)