

Qi (Rose) Yu

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RESEARCH INTERESTS Large-Scale Spatiotemporal Learning, Deep learning, Tensor Methods, and their applications.

APPOINTMENT **Northeastern University**, Boston, Massachusetts
Khoury College of Computer Sciences
Assistant Professor, Aug 2018 - Present

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

EDUCATION **University of Southern California**, Los Angeles, California
Ph.D., Computer Science, 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
Chu Kochen Honors College
B.S in Computer Science, Aug 2008 - June 2012
• Advisor: Zhihua Zhang

SELECTED AWARDS AND HONORS **Best Dissertation Award**, Computer Science Department, University of Southern California, 2018

Best Paper Award at *Advances in Neural Information Processing Systems* (NIPS), time series workshop, 2017

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

Selected in MIT Rising Stars in EECS: An Academic Career Workshop for Women, MIT, 2015

Annenberg Graduate Fellowship, University of Southern California, 2012-present

Selected in ACM Heidelberg Laureate Forum - Abel, Fields, Turing laureates meet next generation, 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

Outstanding Undergraduate Award, Zhejiang University, 2009, 2008.

PREPRINTS

- [P1] Rose Yu, Sung-En Chang, Xun Zheng, Ian E.H. Yen ,Pradeep Ravikumar "Efficient Tensor Decomposition with Boolean Factors" Preprint *arXiv:1810.04754*
- [P2] Stephan Zheng, Rose Yu, Yisong Yue "Multi-resolution Tensor Learning for Large-Scale Spatial Data" Preprint *arXiv:1802.06825*
- [P3] Rose Yu, Stephan Zheng, Anima Anandkumar, Yisong Yue "Long-term Forecasting using Tensor-Train RNNs" Preprint *arXiv:1711.00073*
- [P4] Paroma Varma, Bryan He, Dan Iter, Peng Xu, Rose Yu, Christopher De Sa, Christopher Ré, "Socratic Learning", Preprint *arXiv:1610.08123*

CONFERENCE
PUBLICATIONS

- [C1] Nima Dehmamy, Albert-László Barabási, Rose Yu. "Understanding the Representation Power of Graph Neural Networks in Learning Graph Topology" To appear in *Proceeding of Advances in Neural Information Processing Systems* (NeurIPS), 2019
- [C2] Yukai Liu, Rose Yu, Stephan Zheng, Eric Zhan, Yisong Yue. "NAOMI: Non-Autoregressive Multiresolution Sequence Imputation" To appear in *Proceeding of Advances in Neural Information Processing Systems* (NeurIPS), 2019
- [C3] 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
- [C4] 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
- [C5] Rose Yu, Guangyu Li, Yan Liu. "Tensor regression meets Gaussian Processes." In *Proceedings of International Conference on Artificial Intelligence and Statistics* (AISTATS), 2018
- [C6] 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
- [C7] Rose Yu, Yan Liu. "Learning from Multiway Data: Simple and Efficient Tensor Regression." In *Proceedings of the 33th International Conference on Machine Learning* (ICML), 2016
- [C8] 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
- [C9] 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
- [C10] Rose Yu, Dehua Cheng, Yan Liu. "Accelerated Online Low Rank Tensor Learning for Multivariate Spatiotemporal Streams." In *Proceedings of the 32th International Conference on Machine Learning* (ICML), 2015
- [C11] 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**
- [C12] 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
- [C13] 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

- [C14] Qi Yu, Zhihao Ding, Rong Rong, Wang Donghui, Zhengyue Zhang. "Dark Pixel Detection: A Novel Single Image Dehaze Approach". In *Proceeding of 27th Image and Vision Computing New Zealand (IVCNZ)*, 2011

JOURNAL
PUBLICATIONS

- [J1] Rose Yu, Yan Liu. "Spatio-Temporal Analysis of Social Media Data" In *Encyclopedia of GIS*, 2016
- [J2] Rose Yu, Huida Qiu, Zhen Wen, Ching-Yung Liu, Yan Liu. "A Survey on Social Media Analysis Anomaly Detection" In *ACM KDD Exploration*, 2016
- [J3] 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

SELECTED
WORKSHOP PAPERS
(UNREFEREED)

- [W1] Rui Wang, Adrian Albert, Karthik Kashinath, Mustafa Mustafa, Rose Yu. "Towards physics informed deep learning for spatiotemporal modeling of turbulence flow". **Oral Presentation** at *Advances in Neural Information Processing Systems (NeurIPS)*, Machine Learning for Physical Sciences workshop, 2019
- [W2] Clara De Paolis, Saeed Amizadeh, Rose Yu. "A Neural Framework for Learning DAG to DAG Translation ". In *Advances in Neural Information Processing Systems (NeurIPS)*, relational representation learning workshop, 2018
- [W3] Rose Yu, Stephan Zheng, Anima Anandkumar, Yisong Yue. "Long-term forecasting using Tensor-Train RNN". **Best Paper Award** in *Advances in Neural Information Processing Systems (NIPS)*, time series workshop, 2017
- [W4] Yaguang Li, Rose Yu, Cyrus Shahabi, Yan Liu. "Diffusion Convolutional Recurrent Neural Network: Data-Driven Traffic Forecasting". **Oral Presentation** at *Advances in Neural Information Processing Systems (NIPS)*, time series workshop, 2017
- [W5] Rose Yu, Stephan Zheng. "Learning Chaotic Dynamics with Tensor RNN". In *International Conference on Machine Learning (ICML)*, Deep structured prediction workshop, 2017
- [W6] Rose Yu, Paroma Varma, Dan Iter, Chris De Sa, Christopher Re, "Socratic Learning". In *Advances in Neural Information Processing Systems (NIPS)* future of interactive machine learning workshop, 2016

RESEARCH GRANTS

- [G1] NSF CRII, *IIS-1850349: Multiresolution Tensor Learning for Scalable and Interpretable Spatiotemporal Analysis*, \$174,998, Aug, 2019 - July, 2021
- [G2] Abiomed Research Grant, *Anticipating Patient Outcome via Machine Learning*, \$50,000, July, 2019 - Sep, 2020
- [G3] ONR ECP, *Subcontract: Learning and Prediction of Dynamic Processes on Evolving Networks*, \$71,784, June, 2019 - Dec, 2019
- [G4] Mathworks Microgrant, *Battery State of Health Machine Learning Prognostics*, \$17,400, Sep, 2019 - Dec, 2019
- [G5] Navy STTR, *Subcontract: Predictive Graph Convolutional Networks*, \$28,840, March, 2019 - Oct, 2019
- [G6] Northeastern Tier 1, *Physics-informed Deep Learning for High-Resolution Climate Extremes Modeling*, \$50,000, July, 2019 - Sep, 2020
- [G7] Northeastern Khory Seed Grant, *Learning Bimanual Robotic Manipulation Via Deep Graph Sequence*, \$50,000, Aug, 2019 - Aug, 2020

EMPLOYMENT

IBM Thomas J. Watson Research Center, Yorktown Heights, New York, USA*Research Intern*

June 2015 - August 2015

Work with Hongfei Li, Anshul Sheopuri in Customer Analytic team on IBM Xtify push intelligence platform. Developed deep learning models for GPS data from Xtify to predict users' click behavior and build customer profiles.

Yahoo! Labs, Sunnyvale, California, USA*Research Intern*

June 2014 - August 2014

Work with Andrew Gelfand, Suju Rajan in Personalization team on Yahoo! Aviate location-aware app recommendation. Developed a hierarchical Bayesian model for geographical segmentation problem in App usage. Continue academic collaboration through November on "Geographic Segmentation via Latent Poisson Factor Model".

Intel Lab, Santa Clara, California, USA*Research Intern*

May 2013 - August 2013

Work with Context-Aware Technology team of Intel Immersive Experience Research (IXR) division. Analyze smart phone usage data and propose a graphical model based algorithm to predict the potential contacts and applications on smart phones. Analyze NBC Universal movie data and fit regression models to predict future DVD/CD sales.

Microsoft R&D, Minghang, Shanghai, USA*Program Manager Intern*

June 2011 - June 2012

Work with Commerce team in Microsoft's Server & Tools Business. Build SDK Wiki for Commerce platform partners. Design API prototype for guest purchase without Window Live ID authentication feature. Adapt platform working flow of payment instruments risk check and fraud detection for Microsoft Office 360 and Azure.

TEACHING

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 2018

Machine Learning (CS 6140)

Fall 2018

INVITED TALK

Year 2020

Functional Data over Multidimensional Domain, EPFL, Switzerland,

April 2020

AI for Robust Engineering and Science workshop, Oak Ridge National Lab

Jan, 2020

Physics Informed Machine Learning workshop, Los Alamos National Lab

Jan, 2020

Year 2019

Mitsubishi Electric Research Laboratories (MERL), Cambridge

Oct, 2020

Plenary Speaker, European Research Network on System Identification

Sep, 2019

Hazy Research Group Seminar, Stanford University

August, 2019

KDD 2019 Tensor Methods Workshop, Anchorage

August, 2019

University of Connecticut, Connecticut	July, 2019
Google Research, Mountain View	July, 2019
Machine Learning Theory Workshop, Peking University, China	June, 2019
Auto Lab, University of Michigan, Ann Arbor	May, 2019
ICLR 2019 Workshop on Deep Generative Models, New Orleans	May, 2019
Tensor Working Group on Simons Foundation, New York	May 2019
Workshop Low-rank Optimization and Applications, Leipzig, Germany	April, 2019
Young European Probablists XV workshop, Eindhoven, Netherland	March, 2019
Lawrence Berkeley National Laboratory (LBNL)	March, 2019
Year 2018	
Amazon Research, Palo Alto	Dec, 2018
Salesforce Research, Palo Alto,	Dec, 2018
Machine Learning Group Seminar, Harvard,	Nov 28, 2018
Clinical Machine Learning Group Seminar, MIT,	Nov 13, 2018
Keynote Speaker , Climate Informatics 2018 (CI 2018),	Sep 2018
Henry L. Pierce Laboratory Seminar Series, MIT,	Sep 12, 2018
Japan RIKEN Center for Advanced Intelligence Project (AIP), Tokyo,	July 3, 2018
Disney Research, Burbank,	May 22, 2018
Year 2017	
Department of Management Science, University of Miami	Nov 18, 2017
Department of Computing and Mathematically Sciences, Caltech	Oct 6, 2017
Center of Data Science, New York University	March 30, 2017
Department of Computer Science, Brown University	March 13, 2017
School of Industrial and Systems Engineering, Georgia Institute of Technology	March 6, 2017
College of Computer and Information Science, Northeastern University	March 3, 2017
AI with The Best, Online Conference	Sep 17, 2016
Computer Science Department, Stanford University	May 23, 2016

ACADEMIC SERVICE **Workshop Co-organizer**

ICML Time Series Workshop, 2019
ICML Time Series Workshop, 2017
NIPS Woman in Machine Learning Workshop, 2016
NIPS workshop on Learning with Tensors: Why Now and How? (Tensor-Learn), 2016

Conference Organizing Committee

KITP: At the Crossroad of Physics and Machine Learning, 2018
Poster Chair, KDD (2020)
Proceedings Chair, WSDM (2018)
Short Paper Chair, CIKM (2017)

Grant Reviewer/Panelist

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

Senior Program Committee (or Area Chair)

ICML(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

Proceedings of IEEE, 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)