

## Qi (Rose) Yu

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

CURRENT  
APPOINTMENT      **Northeastern University**, Boston, Massachusetts  
*Assistant Professor, Khoury College of Computer Sciences*      Aug 2018 - Present  
*Network Science Institute, College of Engineering (By Courtesy)*

PREVIOUS  
APPOINTMENT      **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      **Adobe Data Science Research Awards**, Adobe Research, 2020

**Google Faculty Research Award**, Google Research, 2019-2020

**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

PREPRINTS

- [P1] Rui Wang, Robin Walters, Rose Yu "Incorporating Symmetry into Deep Dynamics Models for Improved Generalization" Preprint *arXiv:2002.03061*
- [P2] Jung Yeon Park, Kenneth Theo Carr, Stephan Zheng, Yisong Yue, Rose Yu "Multiresolution Tensor Learning for Efficient and Interpretable Spatial Analysis" Preprint *2002.05578*
- [P3] Rose Yu, Sung-En Chang, Xun Zheng, Ian E.H. Yen ,Pradeep Ravikumar "Efficient Tensor Decomposition with Boolean Factors" Preprint *arXiv:1810.04754*
- [P4] Rose Yu, Stephan Zheng, Anima Anandkumar, Yisong Yue "Long-term Forecasting using Tensor-Train RNNs" Preprint *arXiv:1711.00073*
- [P5] Paroma Varma, Bryan He, Dan Iter, Peng Xu, Rose Yu, Christopher De Sa, Christopher Ré, "Socratic Learning", Preprint *arXiv:1610.08123*

CONFERENCE  
PUBLICATIONS

- [C1] 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
- [C2] 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
- [C3] 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
- [C4] 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
- [C5] 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
- [C6] Rose Yu, Guangyu Li, Yan Liu. "Tensor regression meets Gaussian Processes." In *Proceedings of International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018
- [C7] 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
- [C8] 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
- [C9] 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

- [C10] 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
- [C11] 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
- [C12] 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**
- [C13] 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
- [C14] 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
- [C15] 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]	NERSC AY 2020 Exploratory Allocation Award <i>Physics Informed Deep Learning for Predicting Turbulence Flow</i> , 45,000 (NERSC MPP Hours) , Jan 2020 - Jan, 2021.
	[G2]	PI, NSF CRII, <i>IIS-1850349: Multiresolution Tensor Learning for Scalable and Interpretable Spatiotemporal Analysis</i> , \$174,998, Aug, 2019 - July, 2021
	[G3]	PI, Abiomed Research Grant, <i>Anticipating Patient Outcome via Machine Learning</i> , \$50,000, July, 2019 - Sep, 2020
	[G4]	PI, ONR STTR, <i>N68335-19-C-0310: Subcontract: Predictive Graph Convolutional Networks</i> , \$71,784, June, 2019 - Dec, 2019
	[G5]	Co-PI, Mathworks Microgrant, <i>Battery State of Health Machine Learning Prognostics</i> , \$17,400, Sep, 2019 - Dec, 2019
	[G6]	Co-PI, ONR ECP, <i>Subcontract: Learning and Prediction of Dynamic Processes on Evolving Networks</i> , \$28,840, March, 2019 - Oct, 2019
	[G7]	PI, Northeastern Tier 1, <i>Physics-Informed Deep Learning for High-Resolution Climate Extremes Modeling</i> , \$50,000, July, 2019 - Sep, 2020
	[G8]	PI, Northeastern Khory Seed Grant, <i>Learning Bimanual Robotic Manipulation Via Deep Graph Sequence</i> , \$50,000, Aug, 2019 - Aug, 2020
	[G9]	NVIDIA GPU Grant Oct 2018, 1 Titan Xp, Amazon AWS Research Credits, Oct 2018, \$20,000 Cloud Credits, Google Cloud Research Credits, Oct, 2018, \$10,000 Cloud Credits

TEACHING	<b>Advanced Machine Learning (CS 7140)</b>	Spring 2020
	<b>Machine Learning Seminar (CS 4950)</b>	Fall 2019
	<b>Introduction to Computer Science Research (CS 3950)</b>	Fall 2019
	<b>Special Topics in AI: Deep Learning (CS 7180)</b>	Spring 2019
	<b>Machine Learning (CS 6140)</b>	Fall 2018

INVITED TALK	<b>Year 2020</b>	
	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
	<b>Year 2019</b>	
	Mitsubishi Electric Research Laboratories (MERL), Cambridge	Oct, 2020
	<b>Plenary Speaker</b> , 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
<b>Keynote Speaker</b> , 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)**

NeurIPS (2020), ICML(2020), 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**

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)