Anqi (Angie) Liu

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RESEARCH INTEREST

My research interest lies in machine learning and applying it in the real world. I am particularly interested in solving problems concerning data-limited regimes, safety-critical applications, and the social impact of AI. I aim to design principled robust learning methods for building more human-compatible systems in the real world.

EDUCATION

Ph.D. in Computer Science 2018
University of Illinois at Chicago (UIC)
Advisor: Prof. Brian Ziebart
Thesis: Robust Prediction Methods for Covariate Shift and Active Learning
GPA: 3.92/4.0

B.E. in Software Engineering 2012
B.A. in Finance 2012
Tianjin University of Finance and Economics (TUFE)
GPA: 3.85/4.0

EMPLOYMENT

Postdoctoral Scholar at Caltech 2018.7-present

- Host: Prof. Yisong Yue and Prof. Anima Anandkumar
- Collaboration with: Prof. Soon-Jo Chung and Prof. Mike Alvarez
- *Lead Projects: Safe Exploration and Learning in Control Systems,*
  Distributionally Robust Learning for Unsupervised Domain Adaptation,
  Domain Adaptation and Active Learning under Label Shift,
  Distributionally Robust Off-Policy Evaluation and Learning,
  Causal Discovery using Method of Moments,
  Trolling Detection and Topic Evolution Modeling with Large-Scale Social Media Data.

Research Assistant at UIC 2013.6-2018.5

- Advisor: Prof. Brian Ziebart
- Collaboration with: Prof. Lev Reyzin and Prof. Xinhua Zhang
- *Projects: Towards Safer Inductive Learning, Shift-Pessimistic Active Learning*

Summer Research Assistant Intern at NEC Labs 2017.5-2017.8

- Mentor: Dr. Paul Vernaza, Dr. Kihyuk Sohn
- *Project: Learning invertible warped analytic models of deep Gibbs densities for image generation.* Implemented a new deep generative adversarial model, analyzed its learning properties on generating realistic looking images and obtaining good test set likelihood.

Summer Data Scientist Intern at Microsoft 2015.5-2015.8

- *Project: Predictive maintenance for equipment status in the energy industry.*

PREPRINTS

[P1] Haoxuan Wang, **Anqi Liu**, Zhiding Yu, Yisong Yue, and Anima Anandkumar. **Distributionally Robust Learning for Unsupervised Domain Adaptation**, 2020.

[P2] Eric Zhao, **Anqi Liu**, Anima Anandkumar, and Yisong Yue. **Active Learning under Label Shift**, 2020.

[P3] **Anqi Liu**, Hao Liu, Tongxin Li, Saeed Karimi Bidhendi, Yisong Yue, and Anima Anandkumar. **Disentangling Causal Effects from Latent Confounders using**

Method of Moments, 2020.

[P4] **Anqi Liu**, Hao Liu, Anima Anandkumar, and Yisong Yue. **Distributionally Robust Off-Policy Evaluation**, 2019.

[P5] Rizal Fathony, Kaiser Asif, **Anqi Liu**, Mohammad Ali Bashiri, Wei Xing, Sima Behpour, Xinhua Zhang, and Brian D. Ziebart. **Consistent Robust Adversarial Prediction for General Multiclass Classification**, 2018.

[P6] **Anqi Liu** and Brian D. Ziebart. **Robust Covariate Shift Prediction with General Losses and Feature Views,** 2018.

[P7] **Anqi Liu**, Rizal Fathony, and Brian D. Ziebart. **Consistent and Robust Classification under Covariate Shift,** 2017.

JOURNAL PUBLICATIONS

[J1] Yashwanth Kumar Nakka, **Anqi Liu**, Guanya Shi, Anima Anandkumar, Yisong Yue, and Soon-Jo Chung. **Chance-Constrained Trajectory Optimization for Safe Exploration and Learning of Nonlinear Systems**, RA-L 2020.

CONFERENCE PUBLICATIONS

[C1] Ashkan Rezaei, **Anqi Liu**, Omid Memarrast, and Brian D. Ziebart. **Robust Fairness Under Covariate Shift**. *In proceedings of AAAI conference on Artificial Intelligence (AAAI)*, 2021 .

[C2] **Anqi Liu**, Guanya Shi, Soon-Jo Chung, Anima Anandkumar, and Yisong Yue. **Robust Regression for Safe Exploration in Control**. *Learning for Dynamics and Control (L4DC)*, 2020.

[C3] Sima Behpour, **Anqi Liu**, Brian D. Ziebart. **Active Learning for Probabilistic Structured Prediction of Cuts and Matching.** *International Conference on Machine Learning (ICML)*, 2019.

[C4] Kamyar Azizzadenesheli, **Anqi Liu**, Fanny Yang, and Anima Anandkumar. **Regularized Learning for Domain Adaptation under Label Shifts**. *International Conference on Learning Representations (ICLR)*, 2019

[C5] Nicholas Rhinehart, **Anqi Liu**, Kihyuk Sohn, and Paul Vernaza. **Learning Gibbs-Regularized Pushforward Density Estimators with a Symmetric KL Objective**. *BayLearn Symposium*, 2018

[C6] Rizal Fathony, **Anqi Liu**, Kaiser Asif, and Brian D. Ziebart. **Adversarial Multiclass Classification: A Risk Minimization Perspective**. *In proceedings of Neural Information Processing Systems (NeurIPS)*, 2016.

[C7] Xiangli Chen, Mathew Monfort, **Anqi Liu**, and Brian D. Ziebart. **Robust Covariate Shift Regression**. *In Proceedings of International Conference on Artificial Intelligence and Statistics (AISTAT)*, 2016.

[C8] Hong Wang, **Anqi Liu**, Jing Wang, Brian D. Ziebart, Clement T. Yu, and Warren Shen. **Context Retrieval for Web Tables**. *In ACM International Conference on the Theory of Information Retrieval (ICTIR)*, 2015.

[C9] Mathew Monfort, **Anqi Liu**, and Brian D. Ziebart. **Trajectory Forecasting and Intent Recognition via Predictive Inverse Linear-Quadratic Regulation**. *In proceedings of AAAI conference on Artificial Intelligence (AAAI)*, 2015.

[C10] **Anqi Liu**, Lev Reyzin, and Brian D. Ziebart. **Shift-Pessimistic Active Learning using Robust Bias-Aware Prediction**. *In proceedings of AAAI conference on Artificial Intelligence (AAAI)*, 2015.

[C11] **Anqi Liu** and Brian D. Ziebart. **Robust Classification under Sample Selection Bias**. *In proceedings of Neural Information Processing Systems (NeurIPS)*, 2014. **Spotlight**

SELECTED WORKSHOP CONTRIBUTIONS

[W1] Qixuan (Alice) Jin, Guanya Shi, Anqi Liu, Hao Liu, Haosheng Zou, Yisong Yue. **Active Domain Randomization for Robust Control.** *In ICML WIML Un-Workshop, 2020.*

[W2] Sara Kangaslahti, Anqi Liu, Jean Kossaifi, R. Michael Alvarez, and Anima Anandkumar. **Understanding the Evolution of the #MeToo Movement Over Time Using Topic Models.** *In ICML WIML Un-Workshop, 2020.*

[W3] Haoxuan Wang, Anqi Liu, Anima Anandkumar, and Yisong Yue. **Deep Robust Classification under Domain Shift with Differentiable Density Ratio Estimation.** *In ICML Workshop on Uncertainty and Robustness in Deep Learning, 2020*.

[W4] Hao Liu, Anqi Liu, Tongxin Li, and Anima Anandkumar. **Disentangling Causal Effects from Latent Confounders using Interventions**. *In NeurIPS Workshop on Causal Machine Learning, 2019*.

[W5] Anqi Liu, Maya Srikanth, Nicholas Adams-Cohen, R. Michael Alvarez, and Anima Anandkumar. **Finding Social Media Trolls: Dynamic Keyword Selection Methods for Rapidly-Evolving Online Debates**. *In NeurIPS Joint Workshop on AI for Social Good, 2019*.

[W6] Quanying Liu, Haiyan Wu, and Anqi Liu. **Modeling and Interpreting Human Risk Decision Making using Inverse Reinforcement Learning**. *In ICML workshop: Real-World Sequential Decision Making, 2019*.

SOCIAL SCIENCES CONFERENCES

[S1] Maya Srikanth, Nicholas Adams-Cohen, Betty Wang, Anqi Liu, Anima Anandkumar, and R. Michael Alvarez. **Artificial Intelligence Chatbot to Combat Trolling on Social Media Platforms**. *In American Political Science Association Annal Meeting and Exhibition, 2020*.

[S2] Maya Srikanth, Nicholas Adams-Cohen, Anqi Liu, Jian Cao, Anima Anandkumar, R. Michael Alvarez. **Tracking Social Media Movements with Dynamic Keyword Algorithm**. *In Annual Meeting of the Society for Political Methodology, 2020*.

OTHER TALKS

Machine Learning for the Real World: Distributionally Robust Extrapolation. *In MLconf, 2020.*

Machine Learning for the Real World: Conservative Extrapolation under Domain Shift. *In PNNL MARS Seminar Series, 2020.*

Machine Learning for the Real World: Conservative Extrapolation under Domain Shift. *In PIMCO Seminar Series, 2020.*

Active Learning under Label Shift. *In Caltech RSRG Seminar, 2020.*

Machine Learning for the Real World: Provable Robust Extrapolation. *In Caltech DOLCIT Seminar Series, 2019.*

Machine Learning for the Real World: Provable Robust Extrapolation. *University of Michigan, AI Symposium, 2019.*

Machine Learning for the Real World: Provable Robust Extrapolation. *Emory University, Department of Computer Science, 2019.*

Robust Prediction under Distribution Shifts. *In University of California, San Diego, Statistics and Data Science Symposium, 2019.*

Avoiding Pitfall of Active Learning using Robust Covariate Shift Classification. *In Caltech DOLCIT Seminar Series, 2018*

Avoiding Pitfall of Active Learning using Robust Covariate Shift Classification. *Microsoft Research New York City, 2018.*

Avoiding Pitfall of Active Learning using Robust Covariate Shift Classification. *University of Chicago, Booth School of Business, 2018.*

Robust Covariate Shift Classification with Exact Loss Functions. *In NeurIPS workshop: Aligned Artificial Intelligence, 2017.*

Robust Classification under Covariate Shift with Application to Active Learning. *In AAAI Doctoral Consortium, 2016*.

Robust Covariate Shift Classification with Multiple Feature Views. *In NeurIPS workshop: Reliable Machine Learning in the Wild, 2016.*

TEACHING EXPERIENCE

Guest Lecture and Project Mentor at Caltech Winter 2019, Winter 2020

- CS/CNS/EE/IDS 165: Foundations of Machine Learning
- *Topic: Methods for Distribution Shift.*

Teaching Assistant at UIC Fall 2012, Spring 2013

- CS 107: Introduction to Computing and Programming
- *Responsibility: Led lab sessions, guided homework solution discussions, graded assignments, gave quizzes and mentored undergraduate in office hours.*

MENTORING EXPERIENCE

Guanya Shi, Caltech Ph.D. student, collaborate on [J1][C2].	2018-2020
Hao Liu, Caltech Ph.D. student, collaborate on [P3][P4][W4].	2019-2020
Yashwanth Kumar Nakka, Caltech Ph.D. student, collaborate on [J1].	2019-2020
Haoxuan Wang, Shanghai Jiao Tong University, Senior, collaborate on [P1][W3].	2019-2020
Eric Zhao, Caltech Senior, collaborate on [P1].	2019-2020
Maya Srikanth, Caltech Junior, collaborate on [W5][S1][S2].	2019-2020
Sara Kangaslahti, Caltech Junior, collaborate on [W2].	2019-2020
Alice Jin, Caltech Junior, collaborate on [W1].	2019-2020
Alycia Lee, Caltech Junior, working draft: **Adversarial Abstaining for Fine-Grained Classification**.	2019-2020
Albert Zhai, Caltech Junior, working draft: **Latent Stitch Visual Memory: Structured Memory for Spatial Feature Aggregation**.	2019-2020

RESEARCH SERVICES

Project Coordinator, DARPA PAI Project: Physics-Infused Learning for Autonomous Dynamic Robots.	2018-2020
Reviewer, ICLR	2021
Reviewer, ICLR/AAAI/IJCAI/ICML/NeurIPS/PAKDD/ECAI.	2020
Facilitator, Caltech AI4Science Office Hours.	2019-2020
Organizer, Caltech 2nd Workshop on AI4Science.	2019
Reviewer, ICLR DebugML workshop.	2019
Reviewer, PAKDD/ICML/IJCAI/NeurIPS	2019
Reviewer, ICML/NeurIPS/WIML.	2018
Reviewer, NeurIPS/ECML/WIML.	2017
Reviewer, IEEE Transactions on Cybernetics 2016.	

DIVERSITY SERVICES

Diversity Committee, Caltech Postdoctoral Association.	2019-2020
Mentor, Caltech Freshman Summer Research Institute.	2019
Mentor, Caltech Summer Undergraduate Research Program.	2019

	Mentor, Caltech Women Mentor Women Program.	2019
	Mentor, Caltech Summer Research Connection Program.	2019
	Volunteer, Women in Machine Learning Workshop.	2014

SELECTED HONORS AWARDS	EECS RisingStar at UC Berkeley	2020
	PIMCO Postdoctoral Fellowship	2019-2020
	Travel Awards of ICML	2019
	Doctoral Consortium Scholarship, AAAI	2016
	Travel Award of AAAI	2015
	Travel Award of NeurIPS, WIML	2014
	Travel Award of CRA-W Grad Cohort	2013-2015
	Tianjin Municipal Merit Student, top 0.1%	2012
	TUFE Best Graduation Project and Thesis Award	2012
	Second Prize in China Undergraduate Mathematical Contest in Modeling	2011
	Third Prize in National Software Outsourcing Creativity Competition	2011
	The Tianjin Government Scholarship, top 0.5%	2009
	TUFE Merit Student and First Prize Scholarship, granted 5%	2009-2011
	TUFE First Prize Scholarship for Academic Excellence	2009-2011
	First Prize in Municipal Computer Creative Application Competition	2010
	The Wang Kechang Scholarship, top 0.2%	2009

REFERENCES

1. Prof. Yisong Yue
California Institute of Technology
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2. Prof. Anima Anandkumar
California Institute of Technology
Department of Computing and Mathematical Sciences
Email: anima@caltech.edu

3. Prof. Brian Ziebart
University of Illinois at Chicago
Department of Computer Science
Email: bziebart@uic.edu

4. Prof. Lev Reyzin
University of Illinois at Chicago
Department of Mathematics, Statistics, and Computer Science
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