Yuxin Chen

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CONTACT INFORMATION

5730 S Ellis Avenue, JCL 317
Chicago, IL 60637

Email: chenyuxin@uchicago.edu
Web: http://yuxinchen.org/

RESEARCH APPOINTMENTS

Assistant Professor, Computer Science, University of Chicago	2019 – present
Postdoctoral Scholar, CMS, California Institute of Technology	2017 – 2019
Visiting Scholar, Xerox Research Center Europe, France	2015
Research Intern, Microsoft Research Cambridge, UK	2014
Doctoral Research Assistant, ETH Zurich, Switzerland	2011-2017
Graduate Research Assistant, The University of Kansas	2009-2011

EDUCATION

ETH Zurich, Switzerland

Ph.D., Computer Science — 09/2011 – 02/2017

- Ph.D. Thesis: *Near-optimal Adaptive Information Acquisition – Theory and Applications*
- Thesis Committee: Andreas Krause (advisor), Joachim Buhmann, Kilian Weinberger
- Supported in part by the *Google Ph.D. Fellowship* (2014 – 2017)

The University of Kansas, Lawrence, KS USA

M.Sc. (with honors), Computer Science — 09/2009 – 07/2011

- Master's Thesis: *Understanding User Intentions in Vertical Image Search*
- Thesis Committee: Bo Luo (advisor), Xue-wen Chen, Brian Potetz
- Area of Study: Information Retrieval, Information Security and Privacy

University of Science and Technology of China, Hefei, Anhui China

B.E., Electrical Engineering — 09/2005 – 07/2009

- Advisor: Nenghai Yu
- Graduated from the Special Class for Gifted Young
- Thesis Topic: *Combining Image and Textural Features for Product Search* (Outstanding Bachelor Thesis Award)

AWARDS & GRANTS

NSF #2040989, *FAI: Towards Adaptive and Interactive Post hoc Explanations*	2021 – 2024
NSF #2041970, *EAGER: SaTC-EDU*	2020 – 2022
NSF #2037026, *FMRG: MADE-PUBLIC*	2021 – 2026
C3.ai DTI, *Detection and Containment of Emerging Diseases Using AI Techniques*	2020 – 2021
LLNS, *Machine Learning-Guided Optimization for Large-Scale Biochemistry Optimization*	2020 – 2021
CDAC Discovery Grant, *Towards a Data-driven Trigger System for the Large Hadron Collider*	2020
JTFI AI + Science research grants, *Automated Experimental Design for Cosmic Discovery*	2019
PIMCO Postdoctoral Fellowship in Computing and Mathematical Sciences	2018 – 2019
Swiss National Science Foundation Early Mobility Postdoctoral Fellowship	2017 – 2018
Best Paper Award, Constructive ML Workshop at ICML	2015
Google Europe Fellowship in Interactive Machine Learning	2014 – 2017
Outstanding Bachelor Thesis Award, USTC	2009

PROFESSIONAL SERVICE

Area Chair / Senior Program Committee

- International Conference on Learning Representations (ICLR), 2020
- AAAI Conference on Artificial Intelligence (AAAI), 2020 (SPC)
- International Joint Conference on Artificial Intelligence (IJCAI), 2021 (SPC)
- Neural Information Processing Systems (NeurIPS), 2020 (AC)

Journal Reviewing

- IEEE Transactions on Signal Processing (TSP), 2019
- Operations Research, 2018
- IEEE Transactions on Control of Network Systems (TCNS), 2018
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2017
- Journal of Machine Learning Research (JMLR), 2016, 2017
- IEEE Transactions on Robotics, 2017
- Journal of Artificial Intelligence Research (JAIR), 2016, 2019
- Machine Learning (MLJ), 2016
- Artificial Intelligence (AIJ), 2016
- IEEE Transactions on Multimedia (TMM), 2015
- Statistics and Computing (STCO), 2015
- Algorithmica, 2015, 2016

Conference Reviewing

- International Conference on Artificial Intelligence and Statistics (AISTATS) 2019, 2020
- AAAI Conference on Artificial Intelligence (AAAI) 2018, 2019, 2020
- International Conference on Machine Learning (ICML) 2015, 2016, 2017, 2018 (outstanding reviewer)
- Neural Information Processing Systems (NeurIPS) 2013, 2014, 2015, 2016, 2019
- International Joint Conference on Artificial Intelligence (IJCAI) 2016
- Latin American Theoretical Informatics (LATIN) 2014
- Medical Image Computing and Computer Assisted Intervention (MICCAI) 2014
- Knowledge Discovery and Data Mining (KDD) 2014

Other Services

Summer School/Workshop Organization and Coordination

- "AI + measurements" joint webinar/workshop: Partnering to Advance AI Research & Development, Joint with UChicago, Fermilab & Argonne 2020-2021
- Caltech AI4Science Inaugural Workshop 2018, 2019
- Inaugural Summer School of the joint ETH/MPI Research Network on Learning Systems 2014

Teaching

Instructor at UChicago

- STAT 37710 / CAAM 37710 / CMSC 35400, *Machine Learning* Winter 2021
- STAT 37710 / CMSC 35400, Co-taught with Prof. Rebecca Willett, *Machine Learning* Spring 2020
- CMSC 35401-2, *Topics in Machine Learning: Interactive Learning Systems* Winter 2020

Advising

PhD Students

- Chaoqi Wang, *active*
- Yibo Jiang, *active*

Master Students

- Fengxue Zhang, *active*
- Jiaona Ma (UChicago *MPCS practicum*, Spring 2020)
- Hank Zhang (UChicago *MPCS practicum*, Winter 2020)
- Zifeng Kang (UChicago *MPCS practicum*, Winter 2020)
- Kaustubh Vinchure (UChicago *MPCS practicum*, Winter 2020)
- Shihan Su (Caltech *M.Sc. semester project*, 2017)
- Siddhartha (ETHZ *M.Sc thesis / semester project*, 09/2015 – 05/2016)
- Johannes Kirschner (ETHZ *semester project & M.Sc thesis*, Spring & Fall 2015)
- Victor Carbune (ETHZ *M.Sc thesis*, 04/2013 – 10/2013)
- Hiroaki Shioi (ETHZ *M.Sc thesis*, 09/2012 – 02/2013)
- César Antonio Fuentes Montesinos (ETHZ *M.Sc thesis*, 04/2012 – 10/2012)
- Nan Zhong (ETHZ *M.Sc thesis*, Spring 2012)

Undergraduate & High-school Students

- Chinmaya Mahesh (UIUC; UChicago *CDAC summer lab*), *active*
- Jiaqi Han (Tsinghua University; UChicago *student summer research fellowship program*, 2020)

- Dongwei Xiao (Zhejiang University; UChicago *student summer research fellowship program*, 2020)
- Yair Atlas (UChicago *CDAC summer lab*, 2020)
- Louise Fan (UChicago *undergraduate project*, Winter 2020)
- Emily Jin (Caltech *high-school student volunteer*, Summer 2018, 2019)
- Nikhil Gohsh (Caltech *summer undergraduate research program*, Summer & Fall 2018)
- Ayya Alieva (Caltech *undergraduate semester project*, Spring 2018, 2019)

THESIS COMMITTEES

Current Internal Students at UChicago (excluding own students)

- Ziyu Ye (PhD student)
- Xuefeng Liu (PhD student)
- Renyu Zhang (PhD student; *MS thesis defense*, 2020)
- Horace Pan (PhD student; *MS thesis defense*, 2020)
- Emily Wilson (PhD student; *MS thesis defense*, 2020)
- Lang Yu (PhD student; *PhD candidacy exam*, 2020)

External Students

- Jack Humphreys, *Recent Progress in Appearance-based Action Recognition.* MPhil thesis, University of Sydney, 2020.
- Jingwei Zhang, *Generalization in Deep Learning: Two Theoretical View Points*, MPhil thesis, University of Sydney, 2019

INVITED TALKS

Optimizing Decision Making via Submodular Surrogates

- *Microsoft Research, New England* (12/2020)
- *University of California, Los Angeles* (11/2020)

Algorithmic Aspects of Machine Teaching: Tractability, Interpretability, and Robustness

- *Chalmers University of Technology* (10/2020)
- *Statistics Colloquium, UChicago* (05/2020)

Teaching Multiple Concepts to Forgetful Learners

- *Optimizing Human Learning (Workshop eliciting Adaptive Sequences for Learning (WASL))* (07/2020)

Bayesian Experimental Design in the Physical Sciences

- *Argonne National Laboratory* (01/2020)
- *MLPWS4: Using Physical Insights for Machine Learning, IPAM, UCLA* (11/2019)
- *Toyota Technological Institute at Chicago (TTIC) Colloquium* (11/2019)

Interactive Learning and Decision Making with Machines and People

- *Pacific Investment Management Company, LLC (PIMCO)* (04/2019)
- *Purdue University* (04/2019)
- *New York University, Tandon School of Engineering (NYU Tandon)* (03/2019)
- *Institute of Science and Technology Austria (IST Austria)* (03/2019)
- *University of Waterloo* (02/2019)
- *Duke University* (02/2019)
- *University of North Carolina, Chapel Hill* (02/2019)
- *University of Chicago* (02/2019)
- *Rensselaer Polytechnic Institute* (02/2019)
- *University of California, Santa Barbara* (01/2019)
- *Nanyang Technological University* (01/2019)
- *Delft University of Technology (TU Delft)* (01/2019)
- *Chalmers University of Technology* (11/2018)
- *National University of Singapore* (11/2018)

Near-optimal Adaptive Information Acquisition: Theory and Applications

- *California Institute of Technology* (04/2017)
- *Allen Institute for Artificial Intelligence* (07/2016)
- *Microsoft Research Lab, Redmond* (07/2016)

Sequential Information Gathering With Correlated Tests

- *XRCE seminar, Xerox Research Centre Europe* (06/2016)

Active Detection via Adaptive Submodularity

- *SLI group seminar, Massachusetts Institute of Technology* (02/2014)

Software & Tools

Machine Teaching for Forgetful Human Learners.

- Teaching biodiversity https://www.teaching-biodiversity.cc/
- Teaching German vocabulary https://www.teaching-german.cc/

Conference Publications

(1) Zhe Xu, **Yuxin Chen**, Ufuk Topcu. Adaptive Teaching of Temporal Logic Formulas to Learners with Preferences. In the *35th AAAI Conference on Artificial Intelligence (AAAI)*, 2021 (virtual).

(2) Rati Devidze, Farnam Mansouri, Luis Haug, **Yuxin Chen**, Adish Singla. Understanding the Power and Limitations of Teaching with Imperfect Knowledge. *International Joint Conference on Artificial Intelligence (IJCAI)*, Yokohama, Japan, July 2020 (virtual).

(3) Niklas Akerblom, **Yuxin Chen**, Morteza Haghir Chehreghani. An Online Learning Framework for Energy-Efficient Navigation of Electric Vehicles. In the *International Joint Conference on Artificial Intelligence (IJCAI)*, Yokohama, Japan, July 2020 (virtual).

(4) Jialin Song, Yury S Tokpanov, **Yuxin Chen**, Dagny Fleischman, Katherine T Fountaine, Yisong Yue, Harry A Atwater. Mirrored Plasmonic Filter Design via Active Learning of Multi-Fidelity Physical Models. In the *IEEE Conference on Lasers and Electro-Optics (CLEO)*, May 2020.

(5) Farnam Mansouri, **Yuxin Chen**, Ara Vartanian, Xiaojin Zhu, Adish Singla. Preference-Based Batch and Sequential Teaching: Towards a Unified View of Models. In the *33nd Conference on Neural Information Processing Systems (NeurIPS)*, December 2019.

(6) Nikhil Ghosh, **Yuxin Chen**, Yisong Yue. Landmark Ordinal Embedding. In the *33nd Conference on Neural Information Processing Systems (NeurIPS)*, December 2019.

(7) Anette Hunziker, **Yuxin Chen**, Oisin Mac Aodha, Manuel Gomez Rodriguez, Andreas Krause, Pietro Perona, Yisong Yue, Adish Singla. Teaching Multiple Concepts to Forgetful Learners. In the *33nd Conference on Neural Information Processing Systems (NeurIPS)*, December 2019.

(8) Baihong Jin, Yingshui Tan, Alexander Nettekoven, **Yuxin Chen**, Ufuk Topcu, Yisong Yue, Alberto Sangiovanni-Vincentelli, An Encoder-Decoder Based Approach for Anomaly Detection with Application in Additive Manufacturing. In the *IEEE International Conference on Machine Learning and Applications (ICMLA)*, December 2019.

(9) Baihong Jin, **Yuxin Chen**, Dan Li, Kameshwar Poolla, Alberto Sangiovanni-Vincentelli. An SVM-based Change Point Detection Approach Using Temporal Information. In the *IEEE International Conference on Prognostics and Health Management (PHM)*, San Francisco, CA, June 2019.

(10) Mohamadreza Ahmadi, Bo Wu, **Yuxin Chen**, Yisong Yue, Ufuk Topcu. Barrier Certificates for Assured Machine Teaching. In the *American Control Conference (ACC)*, July 2019.

(11) Jialin Song, **Yuxin Chen**, Yisong Yue. A General Framework for Multi-fidelity Bayesian Optimization with Gaussian Processes. In the *22nd International Conference on Artificial Intelligence and Statistics (AISTATS)* (acceptance rate 32.4%), Naha, Okinawa, Japan, April 2019.

(12) Kevin Yang, **Yuxin Chen**, Alycia Lee, Yisong Yue. Batched Stochastic Bayesian Optimization via Combinatorial Constraints Design. In the *22nd International Conference on Artificial Intelligence and Statistics (AISTATS)* (acceptance rate 32.4%), Naha, Okinawa, Japan, April 2019.

(13) **Yuxin Chen**, Adish Singla, Oisin Mac Aodha, Pietro Perona, Yisong Yue. Understanding the Role of Adaptivity in Machine Teaching: The Case of Version Space Learners. In the *32nd Conference on Neural Information Processing Systems (NeurIPS)* (acceptance rate 20.8%), Montral, Canada, December 2018.

(14) Oisin Mac Aodha, Shihan Su, **Yuxin Chen**, Pietro Perona, and Yisong Yue. Teaching Categories to Human Learners with Visual Explanations. In the *Conference on Computer Vision and Pattern Recognition (CVPR)* (acceptance rate 29.6%), Salt Lake City, UT, June 2018 (**Spotlight Presentation**).

(15) **Yuxin Chen**, Oisin Mac Aodha, Shihan Su, Pietro Perona, Yisong Yue. Near-Optimal Machine Teaching via Explanatory Teaching Sets. In the *21st International Conference on Artificial Intelligence and Statistics (AISTATS)* (acceptance rate 33.2%), Playa Blanca, Lanzarote, Canary Islands, April 2018.

(16) Marc Brockschmidt, **Yuxin Chen**, Pushmeet Kohli, Siddharth Krishna, Daniel Tarlow. Learning Shape Analysis. In the *24th Static Analysis Symposium (SAS)*, New York City, NY, August 2017.

(17) **Yuxin Chen**, Jean-Michel Renders, Morteza Haghir Chehreghani, and Andreas Krause. Near-optimal Value of Information via Dynamic Hypothesis Enumeration. In the *33rd Conference on Uncertainty in Artificial Intelligence (UAI)* (acceptance rate 30.8%), Sydney, Australia, August 2017.

(18) **Yuxin Chen**, S. Hamed Hassani, and Andreas Krause. Near-optimal Bayesian Active Learning with Correlated Noisy Tests. In the *20th International Conference on Artificial Intelligence and Statistics (AISTATS)* (acceptance rate 31.7%), Fort Lauderdale, FL USA, April 2017.

(19) **Yuxin Chen**, S. Hamed Hassani, Amin Karbasi, Andreas Krause. Sequential Information Maximization: When is Greedy Near-optimal?. In the *28th Annual Conference on Learning Theory (COLT)* (acceptance rate 39.77%), Paris, France, July 2015.

(20) **Yuxin Chen**, Shervin Javdani, Amin Karbasi, Drew Bagnell, Siddhartha Srinivasa, Andreas Krause. Submodular Surrogates for Value of Information. In the *29th AAAI Conference on Artificial Intelligence (AAAI)* (acceptance rate 26.67%), Austin, TX, January 2015.

(21) Shervin Javdani, **Yuxin Chen**, Amin Karbasi, Andreas Krause, Drew Bagnell, Siddhartha Srinivasa. Near-optimal Bayesian Active Learning for Decision Making. In the *17th International Conference on Artificial Intelligence and Statistics (AISTATS)* (acceptance rate 35.8%), Reykjavik, Iceland, April 2014.

(22) **Yuxin Chen**, Hiroaki Shioi, Cesar Antonio Fuentes Montesinos, Lian Pin Koh, Serge Wich, Andreas Krause. Active Detection via Adaptive Submodularity. In the *31th International Conference on Machine Learning (ICML)* (acceptance rate 25%), Beijing, China, June 2014.

(23) **Yuxin Chen**, Andreas Krause. Near-optimal Batch Mode Active Learning and Adaptive Submodular Optimization. In Proceedings of the *30th International Conference on Machine Learning (ICML)* (acceptance rate 24%), Atlanta, GA, June 2013.

(24) Yuanliang Meng, Junyan Li, Patrick Denton, **Yuxin Chen**, Bo Luo, Paul Selden, Xue-wen Chen. IPKB: A Digital Library for Invertebrate Paleontology. In *ACM/IEEE - CS Joint Conference on Digital Libraries (JCDL)* (acceptance rate 28%), Washington DC, June 2012

(25) **Yuxin Chen**, Bo Luo. S2A: Secure Smart Household Appliances. Full paper (acceptance rate: 18.58%) at the *2nd ACM Conference on Data and Application Security and Privacy (CODASPY)*, San Antonio, TX, February 2012

(26) **Yuxin Chen**, Brian Potetz, Bo Luo and Xue-wen Chen. Cephalometric Landmark Tracing Using Deformable Templates. In Proceedings of the *1st IEEE Conference on Healthcare Informatics, Imaging, and Systems Biology (HISB)*, San Jose, CA, July 2011.

(27) Fengjun Li, **Yuxin Chen**, Bo Luo, Dongwon Lee and Peng Liu. Privacy-Preserving Group Linkage. Full paper in Proceedings of the *23rd Scientific and Statistical Database Management Conference (SSDBM)*, Portland, OR, July 2011.

(28) **Yuxin Chen**, Nenghai Yu, Bo Luo, and Xue-wen Chen. iLike: Integrating Visual and Textual Features for Vertical Search. Full paper (acceptance rate: 17.48%) at *ACM Multimedia Conference (ACMMM)*, Firenze, Italy, October 2010.

JOURNAL ARTICLES

(29) **Yuxin Chen**, S. Hamed Hassani, and Andreas Krause. Near-optimal Bayesian Active Learning with Correlated Noisy Tests. In *Electronic Journal of Statistics (EJS)*, 2017.

(30) **Yuxin Chen**, Hariprasad Sampathkumar, Bo Luo, and Xue-wen Chen. iLike: Bridging the semantic gap in vertical image search by integrating text and visual features. In *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, Vol. 25 (10) pp. 2257-2270, October 2013.

THESIS

(31) **Yuxin Chen**. Near-optimal Adaptive Information Acquisition: Theory and Applications. *PhD Thesis, ETH Zurich*, December 2016.

(32) **Yuxin Chen**. Understanding User Intentions in Vertical Image Search. *Master Thesis, The University of Kansas*, August 2011.

PATENTS

(33) Jean-Michel Renders, **Yuxin Chen**. Dynamic Resampling for Sequential Diagnosis and Decision Making. *Patent App. US20180218264A1*, August 2018.

(34) Morteza Haghir Chehreghani, **Yuxin Chen**. Method of Trip Prediction by Leveraging Trip Histories from Neighboring Users. *Patent App. US20180012141*, Jan 2018.

WORKSHOP CONTRIBUTIONS

(35) Fengxue Zhang, Yair Altas, Louise Fan, Kaustubh Vinchure, Brian Nord, **Yuxin Chen**. Design of Physical Experiments via Collision-Free Latent Space Optimization. In the *NeurIPS Workshop on Machine Learning and the Physical Sciences*, December 2020.

(36) Chinmaya Mahesh, Kristin Dona, David W. Miller, **Yuxin Chen**. Design of Physical Experiments via Collision-Free Latent Space Optimization. In the *NeurIPS Workshop on Machine Learning and the Physical Sciences*, December 2020.

(37) Kevin Yang, **Yuxin Chen**, Alycia Lee, Yisong Yue. Batched Stochastic Bayesian Optimization via Combinatorial Constraints Design. In the *NeurIPS Workshop on Machine Learning for Molecules and Materials*, Montreal, Canada, December 2018.

(38) Jialin Song, Yury S. Tokpanov, **Yuxin Chen**, Dagny Fleischman, Kate T. Fountaine, Harry A. Atwater, Yisong Yue. Optimizing Photonic Nanostructures via Multi-fidelity Gaussian Processes. In the *NeurIPS Workshop on Machine Learning for Molecules and Materials*, Montreal, Canada, December 2018.

(39) Shihan Su, **Yuxin Chen**, Oisin Mac Aodha, Pietro Perona, Yisong Yue. Interpretable Teaching of Visual Categories to Humans Learner. In the *NIPS Workshop on Teaching Machines, Robots, and Humans*, Long Beach, California, December 2017.

(40) Marc Brockschmidt, **Yuxin Chen**, Byron Cook, Pushmeet Kohli, Daniel Tarlow. Learning to Decipher the Heap for Program Verification. In the *ICML Workshop on Constructive Machine Learning (CML)*, Lille, France, July 2015 (**Winner of the Best Paper Award**).

(41) Shervin Javdani, **Yuxin Chen**, Amin Karbasi, Drew Bagnell, Siddhartha Srinivasa, Andreas Krause. Decision Region Determination for Touch-based Localization. In the *RSS Workshop on Information-based Grasp and Manipulation Planning*, July 2014.

(42) **Yuxin Chen**, Hiroaki Shioi, Cesar Antonio Fuentes Montesinos, Lian Pin Koh, Serge Wich, Andreas Krause. Active Detection for Biodiversity Monitoring via Adaptive Submodularity. In the *NIPS Workshop on Machine Learning for Sustainability (MLSUST)*, Lake Tahoe, NV, December 2013.

(43) **Yuxin Chen**, Andreas Krause. Near-optimal Batch Mode Active Learning and Stochastic Optimization. In the *4th NIPS Workshop on Discrete Optimization in Machine Learning Structure and Scalability (DISCML)*, Lake Tahoe, NV, December 2012.

PREPRINTS

(44) Akash Kumar, Hanqi Zhang, Adish Singla, **Yuxin Chen**. The Teaching Dimension of Kernel Perceptron. *Preprint, arXiv:2010.14043*, 2020.

(45) Farnam Mansouri, **Yuxin Chen**, Ara Vartanian, Xiaojin Zhu, Adish Singla. Preference-Based Batch and Sequential Teaching. *Preprint, arXiv:2010.10012*, 2020.

(46) Yingshui Tan, Baihong Jin, Xiangyu Yue, **Yuxin Chen**, Alberto Sangiovanni Vincentelli. Exploiting Uncertainties from Ensemble Learners to Improve Decision-Making in Healthcare AI. *Preprint, arXiv:2007.06063*, 2020.

(47) Baihong Jin, Yingshui Tan, **Yuxin Chen**, Kameshwar Poolla, Alberto Sangiovanni Vincentelli. Are Ensemble Classifiers Powerful Enough for the Detection and Diagnosis of Intermediate-Severity Faults? *Preprint, arXiv:2007.03167*, 2020.

(48) Akash Kumar, Hanqi Zhang, Adish Singla, **Yuxin Chen**. Average-case Complexity of Teaching Convex Polytopes via Halfspace Queries. *Preprint, arXiv:2006.14677*, 2020.