

Alex Beutel

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INDUSTRY	Google, Research	
EXPERIENCE	Leading projects from basic research to product impact, with > 50 product launches.	
	Senior Staff Research Scientist, Tech Lead, Manager	April 2021–Present
	Staff Research Scientist, Tech Lead, Manager	April 2019–April 2021
	Research lead and team co-lead (> 10 researchers and engineers), driving research across recommender systems, machine learning fairness, and robustness, and applying that research to Google’s products.	
	Senior Research Scientist	Oct. 2017–April 2019
	(1) Led research for fairness in classifiers and recommender systems, driving both research and application in multiple products. (2) Co-led research on reinforcement learning for recommendation. (3) ML lead for learned indexes—using machine learning to improve data structures and databases.	
	Research Scientist	Aug. 2016–Oct. 2017
	Contributed to (co-research lead) developing the first sequential neural recommender system for YouTube.	
	Research Intern , hosted by Ed H. Chi and Derek Cheng	May 2015–Aug. 2015
	Research on improving sub-group accuracy in recommender systems.	
	Microsoft, Cloud and Information Service Lab	
	Research Intern , hosted by Markus Weimer	June 2014–Aug. 2014
	Researched distributed training of recommender systems using probabilistic programming.	
	Facebook, Software Engineering Intern	
	<i>Site Integrity</i> , hosted by Wanhong Xu, Chris Palow	May 2012–Aug. 2013
	Detected synchronized attacks on the social network (fake Page Likes) with a novel temporal graph clustering approach.	
	<i>News Feed Ranking</i> , hosted by Wanhong Xu, Lars Backstrom	May 2013–Aug. 2013
	Researched information quality and content spread.	
EDUCATION	Carnegie Mellon University	August 2011–May 2016
	<i>Ph.D., Computer Science</i>	May 2016
	<i>Masters of Science, Computer Science</i>	December 2013
	Thesis title: “Understanding User Behavior through Large-Scale Graph Analysis”	
	Committee: Christos Faloutsos, Alex Smola, Geoff Gordon, Phillip Yu	
	Duke University	August 2007–May 2011
	<i>Bachelor of Science, Quantitative Studies in Computer Science and Physics</i>	
	GPA: 3.858/4.0; Dean’s List (FA08, FA09) with Distinction (FA07, SP08, SP10)	
	Graduated <i>Magna cum Laude</i> and with <i>Highest Distinction</i> in Computer Science	
HONORS	SIGKDD Doctoral Dissertation Award Runner-up , 2017	
	Best Paper Award , <i>ACM KDD</i> 2016	
	Best Paper Finalist , <i>ACM KDD</i> 2014	
	Facebook Graduate Fellowship , 2013	
	Phi Beta Kappa Honor Society , 2012	
	NSF Graduate Research Fellowship , 2011	
	Alex Vasilos Memorial Award , Duke University Computer Science, 2011	
	Best Paper Award , <i>ACM GIS</i> 2010	
	Computer Science Undergraduate Research Fellow , Duke University 2010	

- C42. **Understanding and Improving Robustness of Vision Transformers through Patch-based Negative Augmentation**
Yao Qin, Chiyuan Zhang, Ting Chen, Balaji Lakshminarayanan, Alex Beutel, Xuezhi Wang. *Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2022.
- C41. **Improving Calibration through the Relationship with Adversarial Robustness**
Yao Qin, Xuezhi Wang, Alex Beutel, Ed H. Chi. *Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2021.
- C40. **Can We Improve Model Robustness through Secondary Attribute Counterfactuals?**
Ananth Balashankar, Xuezhi Wang, Ben Packer, Nithum Thain, Ed H. Chi, Alex Beutel. *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2021.
- C39. **Understanding and Improving Fairness-Accuracy Trade-offs in Multi-task Learning**
Yuyan Wang, Xuezhi Wang, Alex Beutel, Flavien Prost, Jilin Chen, Ed H. Chi. *Proceedings of the 27th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2021.
- C38. **Measuring Model Fairness under Noisy Covariates: A Theoretical Perspective**
Flavien Prost, Pranjal Awasthi, Nick Blumm, Aditee Kumthekar, Trevor Potter, Li Wei, Xuezhi Wang, Ed H. Chi, Jilin Chen, Alex Beutel. *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*, 2021.
- C37. **Towards Content Provider Aware Recommender Systems: A Simulation Study on the Interplay between User and Provider Utilities**
Ruohan Zhan, Konstantina Christakopoulou, Elaine Le, Jayden Ooi, Martin Mladenov, Alex Beutel, Craig Boutilier, Ed H. Chi, Minmin Chen. *TheWebConf*, 2021.
- C36. **Evaluating Fairness of Machine Learning Models Under Uncertain and Incomplete Information**
Pranjal Awasthi, Alex Beutel, Matthaus Kleindessner, Jamie Morganstern, Xuezhi Wang. *FACCT '21: 2021 ACM Conference on Fairness, Accountability, and Transparency*, 2021.
- C35. **Practical Compositional Fairness: Understanding Fairness in Multi-Component Recommender Systems**
Xuezhi Wang, Nithum Thain, Anu Sinha, Flavien Prost, Ed H. Chi, Jilin Chen, Alex Beutel. *Fourteenth ACM International Conference Web Search and Data Mining (WSDM)*, 2021.
- C34. **Enhancing Neural Recommender Models through Domain-Specific Concordance**
Ananth Balashankar, Alex Beutel, Lakshminarayanan Subramanian. *Fourteenth ACM International Conference Web Search and Data Mining (WSDM)*, 2021.
- C33. **Fairness without Demographics through Adversarially Reweighted Learning**
Preethi Lahoti, Alex Beutel, Jilin Chen, Kang Lee, Flavien Prost, Nithum Thain, Xuezhi Wang, Ed H. Chi. *Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2020.
- C32. **CAT-Gen: Improving Robustness in NLP Models via Controlled Adversarial Text Generation**
Tianlu Wang, Xuezhi Wang, Yao Qin, Ben Packer, Kang Li, Jilin Chen, Alex Beutel, Ed H. Chi. *Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2020.
- C31. **Fairness in Recommendation Ranking through Pairwise Comparisons**
Alex Beutel, Jilin Chen, Tulsee Doshi, Hai Qian, Li Wei, Yi Wu, Lukasz Heldt, Zhe Zhao, Lichan Hong, Ed H. Chi, Cristos Goodrow. *Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD Applied Data Science)*, 2019.

- C30. **Towards Neural Mixture Recommender for Long Range Dependent User Sequences**
Jiaxi Tang, Francois Belletti, Sagar Jain, Minmin Chen, Alex Beutel, Can Xu, Ed H. Chi. *WWW 2019: The 2019 Web Conference*, 2019.
- C29. **Top-K Off-Policy Correction for a REINFORCE Recommender System**
Minmin Chen*, Alex Beutel*, Paul Covington*, Sagar Jain, Francois Belletti, Ed H. Chi. *Twelfth ACM International Conference Web Search and Data Mining (WSDM)*, 2019.
- C28. **Putting Fairness Principles into Practice: Challenges, Metrics, and Improvements**
Alex Beutel, Jilin Chen, Tulsee Doshi, Hai Qian, Allison Woodruff, Christine Luu, Pierre Kreitmann, Jonathan Bischof, Ed H. Chi. *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*, 2019.
- C27. **Counterfactual Fairness in Text Classification through Robustness**
Sahaj Garg, Vincent Perot, Nicole Limtiaco, Ankur Taly, Ed H. Chi, Alex Beutel. *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*, 2019.
- C26. **SageDB: A Learned Database System**
Tim Kraska, Mohammad Alizadeh, Alex Beutel, Ed H. Chi, Jialin Ding, Ani Kristo, Guillaume Leclerc, Samuel Madden, Hongzi Mao, Vikram Nathan. *Ninth Biennial Conference on Innovative Data Systems Research (CIDR)*, 2019.
- C25. **Categorical-Attributes-Based Item Classification for Recommender Systems**
Qian Zhao, Jilin Chen, Minmin Chen, Sagar Jain, Alex Beutel, Francois Belletti, Ed H. Chi. *Proceedings of the 12th ACM Conference on Recommender Systems (RecSys)*, 2018.
- C24. **Q&R: A Two-Stage Approach Toward Interactive Recommendation**
Konstantina Christakopoulou, Alex Beutel, Rui Li, Sagar Jain, Ed H. Chi. *Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD Applied Data Science)*, 2018.
- C23. **The Case for Learned Index Structures**
Tim Kraska, Alex Beutel, Ed H. Chi, Jeffrey Dean, Neoklis Polyzotis. *ACM SIGMOD International Conference on Management of Data (SIGMOD)*, 2018.
- C22. **Factorized Recurrent Neural Architectures for Longer Range Dependence**
Francois Belletti, Alex Beutel, Sagar Jain, Ed H. Chi. *21st International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018.
- C21. **Latent Cross: Making Use of Context in Recurrent Recommender Systems**
Alex Beutel, Paul Covington, Sagar Jain, Can Xu, Jia Li, Vince Gatto, Ed H. Chi. *Eleventh ACM International Conference Web Search and Data Mining (WSDM)*, 2018.
- C20. **The Many Faces of Link Fraud**
Neil Shah, Hemank Lamba, Alex Beutel, Christos Faloutsos. *IEEE International Conference on Data Mining (ICDM)*, 2017.
- C19. **Beyond Globally Optimal: Focused Learning for Improved Recommendations**
Alex Beutel, Ed H. Chi, Derek Zhiyuan Cheng, Hubert Pham, John Anderson. *Proceedings of the 26th International Conference on World Wide Web (WWW)*, 2017.
- C18. **Recurrent Recommender Networks**
Chao-Yuan Wu, Amr Ahmed, Alex Beutel, Alex Smola, How Jing. *Tenth ACM International Conference Web Search and Data Mining (WSDM)*, 2017.
- C17. **FRAUDAR: Bounding Graph Fraud in the Face of Camouflage**
Bryan Hooi, Hyun Ah Song, Alex Beutel, Neil Shah, Kijung Shin, Christos Faloutsos. *Proceedings of the 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2016.

- C16. **BIRDNEST: Bayesian Inference for Ratings-Fraud Detection**
Bryan Hooi, Neil Shah, Alex Beutel, Stephan Gunnemann, Leman Akoglu, Mohit Kumar, Disha Makhija, Christos Faloutsos. *2016 SIAM International Conference on Data Mining (SDM)*, 2016.
- C15. **A General Suspiciousness Metric for Dense Blocks in Multimodal Data**
Meng Jiang, Alex Beutel, Peng Cui, Bryan Hooi, Shiqiang Yang, Christos Faloutsos. *IEEE International Conference on Data Mining (ICDM)*, 2015.
- C14. **ACCAMS: Additive Co-Clustering to Approximate Matrices Succinctly**
Alex Beutel, Amr Ahmed, Alexander J. Smola. *Proceedings of the 24th International Conference on World Wide Web (WWW)*, 2015.
- C13. **ND-SYNC: Detecting Synchronized Fraud Activities**
Maria Giatsoglou, Despoina Chatzakou, Neil Shah, Alex Beutel, Christos Faloutsos, Athena Vakali. *19th Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*, 2015.
- C12. **Spotting Suspicious Link Behavior with fBox: An Adversarial Perspective**
Neil Shah, Alex Beutel, Brian Gallagher, Christos Faloutsos. *IEEE International Conference on Data Mining (ICDM)*, 2014.
- C11. **CatchSync: Catching Synchronized Behavior in Large Directed Graphs**
Meng Jiang, Peng Cui, Alex Beutel, Christos Faloutsos, Shiqiang Yang. *Proceedings of the 20th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2014.
- C10. **Inferring Strange Behavior from Connectivity Pattern in Social Networks**
Meng Jiang, Peng Cui, Alex Beutel, Christos Faloutsos, Shiqiang Yang. *18th Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*, 2014.
- C9. **Fugue: Slow-Worker-Agnostic Distributed Learning for Big Models**
Abhimanu Kumar, Alex Beutel, Qirong Ho, Eric P. Xing. *17th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2014.
- C8. **FlexiFaCT: Scalable Flexible Factorization of Coupled Tensors on Hadoop**
Alex Beutel, Abhimanu Kumar, Evangelos E. Papalexakis, Partha Pratim Talukdar, Christos Faloutsos, Eric P. Xing. *2014 SIAM International Conference on Data Mining (SDM)*, 2014.
- C7. **CoBaFi: Collaborative Bayesian Filtering**
Alex Beutel, Kenton Murray, Christos Faloutsos, Alexander J. Smola. *Proceedings of the 23rd International Conference on World Wide Web (WWW)*, 2014.
- C6. **CopyCatch: Stopping Group Attacks by Spotting Lockstep Behavior in Social Networks**
Alex Beutel, Wanhong Xu, Venkatesan Guruswami, Christopher Palow, Christos Faloutsos. *Proceedings of the 22nd International Conference on World Wide Web (WWW)*, 2013.
- C5. **Network Anomaly Detection using Co-clustering**
Evangelos E. Papalexakis, Alex Beutel, Peter Steenkiste. *Proceedings of the 2012 International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 2012.
- C4. **Interacting Viruses on a Network: Can both survive?**
Alex Beutel, B. Aditya Prakash, Roni Rosenfeld, Christos Faloutsos. *Proceedings of the 18th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2012.
- C3. **Winner-takes-all: Competing Viruses on fair-play networks**
B. Aditya Prakash, Alex Beutel, Roni Rosenfeld, Christos Faloutsos. *Proceedings of the 21st International Conference on World Wide Web (WWW)*, 2012.

- C2. **TerraNNI: Natural Neighbor Interpolation on a 3D Grid Using a GPU**
Alex Beutel, Thomas Moelhave, Pankaj K. Agarwal, Arnold P. Boedihardjo, James A. Shine. *Proceedings of the 19th International Symposium on Advances in Geographic Information Systems (ACM GIS)*, 2011.
- C1. **Natural Neighbor Interpolation Based Grid DEM Construction Using a GPU**
Alex Beutel, Thomas Moelhave, Pankaj K. Agarwal. *Proceedings of the 18th International Symposium on Advances in Geographic Information Systems (ACM GIS)*, 2010.
- W17. **Flexible text generation for counterfactual fairness probing**
Zee Fryer, Vera Axelrod, Ben Packer, Alex Beutel, Jilin Chen, Kellie Webster. *Workshop on Online Abuse and Harms (WOAH) at ACL*, 2022.
- W16. **What are effective labels for augmented data? Improving robustness with AutoLabel**
Yao Qin, Xuezhi Wang, Balaji Lakshminarayanan, Ed H. Chi, Alex Beutel. *ICML workshop on Uncertainty and Robustness in Deep Learning*, 2021.
- W15. **Learned Indexes for a Google-scale Disk-based Database**
Hussam Abu-Libdeh, Deniz Altinbukan, Alex Beutel, Ed H. Chi, Lyric Doshi, Tim Kraska, Xiaozhou, Li, Andy Ly, Christopher Olston. *ML for Systems workshop at NeurIPS*, 2020.
- W14. **Building Healthy Recommendation Sequences for Everyone: A Safe Reinforcement Learning Approach**
Ashudeep Singh, Yoni Halpern, Nithum Thain, Konstantina Christakopoulou, Ed H. Chi, Jilin Chen, Alex Beutel. *FACCTRec*, 2020.
- W13. **Learning to Diversify from Human Judgments: Research Directions and Open Challenges**
Emily Denton, Hansa Srinivasan, Dylan Baker, Jilin Chen, Alex Beutel, Tulsee Doshi, Ed H. Chi. *Fair and Responsible AI Workshop at CHI*, 2020.
- W12. **Measuring Recommender System Effects with Simulated Users**
Sirui Yao, Yoni Halpern, Nithum Thain, Xuezhi Wang, Kang Lee, Flavien Prost, Ed H. Chi, Jilin Chen, Alex Beutel. *FATES at WWW*, 2020.
- W11. **Toward a better trade-off between performance and fairness with kernel-based distribution matching**
Flavien Prost, Hai Qian, Qiuwen Chen, Ed H. Chi, Jilin Chen, Alex Beutel. *ML with Guarantees workshop at NeurIPS*, 2019.
- W10. **Transfer of Machine Learning Fairness across Domains**
Candice Schumann, Xuezhi Wang, Alex Beutel, Jilin Chen, Hai Qian, Ed H. Chi. *AI for Social Good workshop at NeurIPS*, 2019.
- W9. **Lifting the Curse of Multidimensional Data with Learned Existence Indexes**
Stephen Macke, Alex Beutel, Tim Kraska, Maheswaran Sathiamoorthy, Derek Zhiyuan Cheng, Ed H. Chi. *ML for Systems workshop at NeurIPS*, 2018.
- W8. **Data Decisions and Theoretical Implications when Adversarially Learning Fair Representations**
Alex Beutel, Jilin Chen, Zhe Zhao, Ed H. Chi. *Workshop on Fairness, Accountability, and Transparency in Machine Learning*, 2017.
- W7. **Joint Training of Ratings and Reviews with Recurrent Recommender Networks**
Chao-Yuan Wu, Amr Ahmed, Alex Beutel, Alex Smola. *Workshop track at 5th International Conference on Learning Representations (ICLR)*, 2017.
- W6. **EdgeCentric: Anomaly Detection in Edge-Attributed Networks**
Neil Shah, Alex Beutel, Bryan Hooi, Leman Akoglu, Stephan Gunnemann, Disha

Makhija, Mohit Kumar, Christos Faloutsos. *IEEE International Conference on Data Mining (ICDM) Workshop on Data Mining for Cyber Security*, 2016.

W5. Additive Co-Clustering of Gaussians and Poissons for Joint Modeling of Ratings and Reviews

Chao-Yuan Wu, Alex Beutel, Amr Ahmed, Alexander J. Smola. *NeurIPS workshop on Nonparametric Methods for Large Scale Representation Learning*, 2015.

W4. Collaborative Bayesian Filtering: Patterns and Methods

Alex Beutel, Kenton Murray, Christos Faloutsos, Alexander J. Smola. *Workshop on Information Networks (WIN)*, 2015.

W3. Elastic Distributed Bayesian Collaborative Filtering

Alex Beutel, Markus Weimer, Tom Minka, Yordan Zaykov, Vijay Narayanan. *NeurIPS Distributed Machine Learning and Matrix Computations workshop*, 2014.

W2. FlexiFaCT: Scalable Flexible Factorization of Coupled Tensors on Hadoop

Alex Beutel, Abhimanu Kumar, Evangelos E. Papalexakis, Partha Pratim Talukdar, Christos Faloutsos, Eric P. Xing. *NeurIPS Big Learning Workshop*, 2013.

W1. Volumetric Grid Construction using 3D Natural Neighbor Interpolation on the GPU

Alex Beutel, Thomas Moelhave, Pankaj K. Agarwal. *MASSIVE '11: Proceedings of the Workshop on Massive Data Algorithmics*, 2011.

REFEREED
JOURNAL
PAPERS

J6. Underspecification Presents Challenges for Credibility in Modern Machine Learning

Alexander D'Amour, Katherine Heller, Dan Moldovan, Ben Adlam, Babak Alipanahi, Alex Beutel, Christina Chen, Jonathan Deaton, Jacob Eisenstein, Matthew D. Hoffman, Farhad Hormozdiari, Neil Houlsby, Shaobo Hou, Ghassen Jerfel, Alan Karthikesalingam, Mario Lucic, Yian Ma, Cory McLean, Diana Mincu, Akinori Mitani, Andrea Montanari, Zachary Nado, Vivek Natarajan, Christopher Nielson, Thomas F. Osborne, Rajiv Raman, Kim Ramasamy, Rory Sayres, Jessica Schrouff, Martin Seneviratne, Shannon Sequeira, Harini Suresh, Victor Veitch, Max Vladymyrov, Xuezhi Wang, Kellie Webster, Steve Yadlowsky, Taedong Yun, Xiaohua Zhai, D. Sculley. *Journal of Machine Learning Research (JMLR)*, 2021.

J5. Graph-Based Fraud Detection in the Face of Camouflage

Bryan Hooi, Kijung Shin, Hyun Ah Song, Alex Beutel, Neil Shah, Christos Faloutsos. *ACM Transactions on Knowledge Discovery from Data (TKDD)*, 2017.

J4. Spotting Suspicious Behaviors in Multimodal Data: A General Metric and Algorithms

Meng Jiang, Alex Beutel, Peng Cui, Bryan Hooi, Shiqiang Yang, Christos Faloutsos. *Transactions on Knowledge and Data Engineering (TKDE)*, 2016.

J3. Catching Synchronized Behaviors in Large Networks: A Graph Mining Approach

Meng Jiang, Peng Cui, Alex Beutel, Christos Faloutsos, Shiqiang Yang. *ACM Transactions on Knowledge Discovery from Data (TKDD)*, 2016.

J2. TerraNNI: Natural Neighbor Interpolation on 2D and 3D Grids using a GPU

Pankaj K. Agarwal, Alex Beutel, Thomas Moelhave. *ACM Transactions on Spatial Algorithms and Systems (TSAS)*, 2016.

J1. Inferring Lockstep Behavior from Connectivity Pattern in Large Graphs

Meng Jiang, Peng Cui, Alex Beutel, Christos Faloutsos, Shiqiang Yang. *Knowledge and Information Systems (KAIS)*, 2015.

BOOK
CHAPTERS

Network Anomaly Detection using Co-clustering

Evangelos E. Papalexakis, Alex Beutel, Peter Steenkiste. *Springer Encyclopedia of Social Network Analysis and Mining*, 2012.

OTHER
PAPERS

Measuring and Reducing Gendered Correlations in Pre-trained Models

Kellie Webster, Xuezhong Wang, Ian Tenney, Alex Beutel, Emily Pitler, Ellie Pavlick, Jilin Chen, Ed H. Chi, Slav Petrov. *Preprint*, 2020.

User Behavior Modeling with Large-Scale Graph Analysis

Alex Beutel. *Ph.D. Thesis, Carnegie Mellon University*, 2016.

User Behavior Modeling and Fraud Detection

Alex Beutel, Christos Faloutsos. *IEEE Intelligent Systems: Trends and Controversies*, 2016.

Explaining reviews and ratings with PACO: Poisson Additive Co-Clustering

Chao-Yuan Wu, Alex Beutel, Amr Ahmed, Alexander J. Smola. *Companion Proceedings of the 25th International Conference on World Wide Web (WWW)*, 2016.

Detecting Suspicious Following Behavior in Multimillion-Node Social Networks

Meng Jiang, Peng Cui, Alex Beutel, Christos Faloutsos, Shiqiang Yang. *Companion Proceedings of the 23rd International Conference on World Wide Web (WWW)*, 2014.

From Point Cloud to 2D and 3D Grids: A Natural Neighbor Interpolation Algorithm using the GPU

Alex Beutel. *Senior Thesis - Graduation with Highest Distinction, Duke University*, 2011.

TUTORIALS

Responsible Recommendation and Search Systems

Alex Beutel, Ed H. Chi, Fernando Diaz, Robin Burke. *WWW*, 2020

Graph-Based User Behavior Modeling: From Prediction to Fraud Detection

Alex Beutel, Leman Akoglu, Christos Faloutsos. *KDD*, 2015

Fraud Detection through Graph-Based User Behavior Modeling

Alex Beutel, Leman Akoglu, Christos Faloutsos. *ACM CCS*, 2015

KEYNOTES

Understanding and Improving Recommenders for All

KDD 2022 Workshop on Data Science and Artificial Intelligence for Responsible Recommendations (DS4RRS), Washington D.C., August 2022

Building and Understanding Recommenders for Long-Term User Experiences

2nd International Workshop on Online and Adaptive Recommender Systems at KDD, Washington D.C., August 2022

Understanding Recommendations over Time

SIGIR'20 Workshop on Deep Reinforcement Learning for Information Retrieval, Zoom, July 2020

Challenges and Progress in Scaling ML Fairness

AISys at SOSP, Huntsville, Ontario, Canada, October 2019

Dynamics and Context in Neural Recommender Systems

LearnIR Workshop at WSDM, Los Angeles, CA, February 2018

INVITED TALKS

Building and Understanding Recommenders for Long-Term User Experiences

2021 SIGIR Workshop On eCommerce, Zoom, July 2021

Building and Understanding Recommenders for Long-Term User Experiences

Twitter, Zoom, May 2021

Building and Understanding Recommenders for Long-Term User Experiences

Spotify, Zoom, April 2021

Fairness in Recommendation

Netflix, Los Gatos, CA, November 2019

Putting Fairness Principles into Practice

Salesforce Research, Palo Alto, CA, August 2019

Learned Data Systems

QCon, New York, NY, June 2019

Putting Fairness Principles into Practice

University of California at Riverside, Riverside, CA, May 2019

Putting Fairness Principles into Practice

QCon.ai, San Francisco, CA, April 2019

ML for Data Systems

Stanford EE380 Colloquium, Palo Alto, CA, October 2018

Dynamics and Context in Neural Recommender Systems

Pinterest, San Francisco, CA, February 2018

Using Context when Modeling User Behavior: Improving Fraud Detection, Neural Rec-ommenders, and Fairness

M.I.T., Cambridge, MA, November 2017

Using Context when Modeling User Behavior: Improving Fraud Detection, Neural Rec-ommenders, and Fairness

Brown University, Providence, RI, November 2017

Beyond Globally Optimal: Focused Learning for Improved Recommendations

Google Student Research Summit, Mountain View, CA, September 2017

ACCAMS: Additive Co-Clustering to Approximate Matrices Succinctly

University of Pennsylvania, Philadelphia, PA, November 2015

Distributed Machine Learning for User Behavior Modeling

Facebook, New York, NY, May 2015

Distributed Machine Learning for User Behavior Modeling

Google Research, New York, NY, May 2015

SGD on Hadoop for Big Data and Huge Models

Duke University, Durham, NC, 2014

OTHER TALKS **Measuring Recommender System Effects with Simulated Users**

FATES, Zoom, April 2020

Fairness in Recommendation Ranking through Pairwise Comparisons

FACTS-IR, Paris, FR, July 2019

Putting Fairness Principles into Practice: Challenges, Metrics, and Improvements

AIES, Honolulu, HI, January 2019

Q&R: A Two-Stage Approach Toward Interactive Recommendation

KDD, London, UK, August 2018

Latent Cross: Making Use of Context in Recurrent Recommender Systems

WSDM, Los Angeles, CA, February 2018

A Machine Learning Approach to Databases Indexes

ML Systems at NeurIPS, Long Beach, CA, December 2017

Beyond Globally Optimal: Focused Learning for Improved Recommendations

WWW, Perth, Australia, April 2017

Beyond Who and What: Answering How and Why by Modeling Large Graphs

Northeastern University, Boston, MA, March 2016

Beyond Who and What: Answering How and Why by Modeling Large Graphs

Arnhold Institute for Global Health, Mount Sinai School of Medicine, New York, NY, March 2016

Beyond Who and What: Answering How and Why by Modeling Large Graphs

IOMS, Stern School of Business, New York University, New York, NY, March 2016

Beyond Who and What: Answering How and Why by Modeling Large Graphs

Google Research, Mountain View, CA, March 2016

Beyond Who and What: Answering How and Why by Modeling Large Graphs

Microsoft, Redmond, WA, March 2016

Beyond Who and What: Answering How and Why by Modeling Large Graphs
Georgia Institute of Technology, Atlanta, GA, February 2016

Beyond Who and What: Answering How and Why by Modeling Large Graphs
New York University, Courant Institute, New York, NY, February 2016

Collaborative Bayesian Filtering: Patterns and Methods
WIN, New York, NY, October 2015

ACCAMS: Additive Co-Clustering to Approximate Matrices Succinctly
WWW, Florence, Italy, May 2015

CoBaFi: Collaborative Bayesian Filtering
WWW, Seoul, South Korea, April 2014

CopyCatch: Stopping Group Attacks by Spotting Lockstep Behavior in Social Networks
WWW, Rio de Janeiro, Brazil, May 2013

Interacting Viruses on a Network: Can both survive?
KDD, Beijing, China, August 2012

TerraNNI: Natural Neighbor Interpolation on a 3D Grid Using a GPU
ACM GIS, Chicago, IL, November 2011

Natural Neighbor Interpolation Based Grid DEM Construction Using a GPU
ACM GIS, San Jose, CA, November 2010

TEACHING
EXPERIENCE

Guest Lecture: Data Mining (Penn State IST557) **Fall 2019**
"Putting Fairness Principles into Practice"

Guest Lecture: Intro to Data & Computational Science (Brown DATA 1030) **Fall 2017**
"Building Blocks of Neural Networks and Research Applications of RNNs"

Guest Lecture: Machine Learning with Large Datasets (CMU 10-805) **Spring 2015**
"SGD on Hadoop for Big Data and Huge Models"

Guest Lecture: Machine Learning with Large Datasets (CMU 10-805) **Spring 2014**
"SGD on Hadoop for Big Data and Huge Models"

Teaching Assistant: Database Applications (CMU 15-415/615) **Spring 2014**

Teaching Assistant: Multimedia DB & Data Mining (CMU 15-826) **Fall 2013**

PATENTS

Systems and Methods for Performing Automatic Label Smoothing of Augmented Training Data, Yao Qin, Alex Beutel, Ed Huai-Hsin Chi, Xuezhong Wang, Balaji Lakshminarayanan. Patent Application 17/493,228.

Elastic multi-resolution model-serving to compute inferences, Christopher Olston, Noah Fiedel, Ed H. Chi, Alexander Beutel. Defensive Publication 668.

Detection of Lockstep Behavior, Alex Beutel and Wanhong Xu. Patent number 9077744; issued July 7, 2015.

STUDENTS
MENTORED AND
ADVISED

9. Ashudeep Singh (2020, Cornell)
8. Ananth Balashankar (2019-2021, NYU)
7. Preethi Lahoti (2019, MPI)
6. Sirui Yao (2019, Virginia Tech)
5. Sahaj Garg (2018, Stanford undergraduate; next position: Luminous Computing)
4. Candice Schumann (2018, UMD; next position: Google Research)
3. Stephen Macke (2018, UIUC; next position: Facebook)
2. Konstantina Christakopoulou (2017, UMN; next position: Google Research)
1. Francois Belletti (2017, UC Berkeley; next position: Google Research)

SERVICE

KDD Cup Co-chair, KDD 2021
Co-organizer: Workshop on Deep Reinforcement Learning for Information Retrieval, SIGIR 2020
Co-organizer: Workshop on Deep Reinforcement Learning, KDD 2019
Co-organizer: Workshop on Machine Learning Systems, NeruIPS 2015
Senior PC: SDM 2022
Senior PC: CIKM 2021
Area Chair: NeurIPS Datasets and Benchmarks track 2021
PC Member: KDD 2017, 2018, 2019, 2020
PC Member: WSDM 2018, 2019, 2020, 2021, 2022
PC Member: WWW 2017, 2018, 2019, 2020, 2021
PC Member: SDM 2017, 2018, 2019
PC Member/Reviewer: FAccT 2019, 2021
SPC Member: IJCAI 2019
PC Member: SIGMOD 2019, 2020
PC Member: ORSUM 2018
PC Member: SocInfo 2016
PC Member: IEEE DSAA Special Session on Big Behavioral Data Analytics 2016
PC Member: ACM/IEEE ASONAM 2016
PhD Forum Committee, ICDM 2015
Mentor at Doctoral Consortium, WSDM 2018
PC Member: Special Session on Big Behavioral Data Analytics, IEEE DSAA 2015
PC Member: Web Information System Engineering (WISE), 2014
PC Member: Diffusion Networks and Cascade Analytics Workshop, WSDM 2014
Reviewer: TKDD, TKDE, NeruIPS, ICML, ICLR, INFORMS Journal on Computing, Neurocomputing, UMUI

FURTHER
ACADEMIC
EXPERIENCE

Carnegie Mellon University, Computer Science Department Sept. 2011–Aug. 2016
 Advised by Professor Christos Faloutsos and Professor Alex Smola.
 My research focused on large-scale user behavior modeling, including fraud detection, recommendation systems, and scalable machine learning.

Duke University, Department of Computer Science Jan. 2010–Aug. 2011
 Research assistant for Prof. Pankaj K. Agarwal in computational geometry.

Duke University, Department of Computer Science Oct. 2009–Dec. 2010
 Research assistant for Prof. Xiaowei Yang in networks and distributed systems.

Duke University, Department of Physics April 2009–Aug. 2009
 Research assistant for Prof. Chris Walter in the high energy physics, neutrino group

ACADEMIC
FUNDING
AWARDS

Facebook Graduate Fellowship, 2013–2014 \$79,202
NSF Graduate Research Fellowship, 2011–2016 \$132,000
Yahoo! Faculty Research and Engagement Program, 2014 \$10,000
 Aided Professor Christos Faloutsos in writing the research proposal
NSF Collaborative Grant (Award No. IIS-1408924), 2014 \$307,908
 Helped multiple professors with the research proposal
ACM GIS Student Travel Grant Award, 2011 \$1,000

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