# Ke Yang

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## Professional Experience

**Postdoctoral Research Associate**, College of Information and Computer Sciences, University of Massachusetts, Amherst 2021.09-
Supervisor: Alexandra Meliou
- Project: Interpretable Machine Learning with data-focused explanations.

**Research Assistant**, Tandon School of Engineering, New York University 2019-2021
Supervisor: Julia Stoyanovich
- Details of the projects can be found at dataresponsibly.github.io.

**Research Intern**, AT&T Research, New York Summer 2019
Supervisors: Emily Dodwell, Ritwik Mitra, and Balachander Krishnamurthy
- Worked on a project to ensure fairness and transparency for internal AT&T machine learning projects. Developed a diagnostic tool for bias-related issues that can be used by project managers and data scientists at AT&T.

**Research Assistant**, College of Computing & Informatics, Drexel University, 2015-2018
Supervisor: Julia Stoyanovich
- Worked on a project to quantify fairness in rankings through equalized representation across groups, and proposed a mitigation framework to ensure a fair ranking outcome.

**Research engineer**, Elite & Resource (start-up company) 2014-2015
Supervisor: Peng Sun
- Worked on a project to model historical data of flood disaster and develop techniques to help with flood prevention. Proposed a model to estimate the probability of future floods using water flow rate of small watershed torrents, which is recognized as a significant signal of potential flood. Our model is integrated as a core component of a national watershed data management system.

## Education

**Ph.D. in Computer Science**, New York University 2021
- Advisor: Julia Stoyanovich, GPA 3.9
- Thesis: Fairness, diversity, and interpretability in ranking
- Committee: Julia Stoyanovich (chair), Sebastian Schelter, Daniel Neill, and Oded Nov

**Ph.D. candidate in Computer Science**, Drexel University (transferred) 2015-2018
- Advisor: Julia Stoyanovich, GPA 3.98

**M.S.E in Computer Science**, Beijing Technology and Business University, 2015
- Advisors: Qian Mo and Zhongming Han, GPA 3.51
- Thesis: Detecting web spammers in online shopping websites
- Graduated summa cum laude

**B.Eng. in Software Engineering**, Beijing Technology and Business University 2012
- Advisor: Qian Mo, GPA 3.45
- Graduated summa cum laude

## Research Interest

My primary area of research centers around data management, especially about the ethical concerns including fairness, transparency, explainability, and the social impact of the algorithms in such systems. I am interested in designing algorithms for mitigating unwanted outcomes from algorithmic decision-making processes and developing tools to apply these algorithms under different scenarios.

## Peer-Reviewed Publications

1. Meike Zehlike, **Ke Yang**, Julia Stoyanovich, "Mapping Normative Frameworks to Fair Ranking", ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO 2021), presented as a poster.
2. **Ke Yang**, Joshua R. Loftus, and Julia Stoyanovich, "Causal Intersectionality and Fair Ranking", in *Proceedings of the 2nd Symposium on Foundations of Responsible Computing* (FORC 2021), arxiv.org/abs/2006.08688.
3. **Ke Yang**, Biao Huang, Julia Stoyanovich, and Sebastian Schelter, "Fairness-Aware Instrumentation of Preprocessing Pipelines for Machine Learning", in *Proceedings of the 4th Workshop on Human-In-the-Loop Data Analytics, in conjunction with the 2020 ACM SIGMOD/PODS Conference* (HILDA@SIGMOD 2020), Portland, OR, USA.
4. **Ke Yang**, Vasilis Gkatzelis, and Julia Stoyanovich, "Balanced ranking with diversity constraints", in *Proceedings of the 28th International Joint Conference on Artificial Intelligence* (IJCAI 2019), Macao, China.
5. **Ke Yang**, Julia Stoyanovich, Abolfazl Asudeh, Bill Howe, H.V. Jagadish, and Gerome Miklau, "A Nutritional Label for Rankings" demo in *Proceedings of the 2018 ACM International Conference on Management of Data* (SIGMOD 2018), Houston, USA.
6. Julia Stoyanovich, **Ke Yang**, H.V. Jagadish, "Online Set Selection with Fairness and Diversity Constraints" in *Proceedings of the 21th International Conference on Extending Database Technology* (EDBT 2018), Vienna, Austria.
7. **Ke Yang**, Julia Stoyanovich, "Measuring Fairness in Ranked Outputs" in *Proceedings of the 29th International Conference on Scientific and Statistical Database Management* (SSDBM 2017), Chicago, USA.
8. Zhongming Han, **Ke Yang**, Xusheng Tan, "Analyzing Spectrum Features of Weight User Relation Graph to Identify Large Spammer Groups in Online Shopping Websites" in *Chinese Journal of Computers*, 40(4): 939-954 (2017) (in Chinese).
9. Zhongming Han, **Ke Yang**, Fengmin Xu, Dagao Duan, "Probabilistic Graphical Model for Detecting Spammers in Microblog Websites" in *Journal of Embedded System*, 8(1): 12-23 (2016).
10. Kai Wang, **Ke Yang**, "A method and application system of detecting web spammers" in *China Invention Patent*, (2015) (in Chinese), No. CN201510012860.
11. Qian Mo, **Ke Yang**, "Overview of Web spammer detection" in *Journal of Software*, 25(7): 1505-1526 (2014) (in Chinese).

## Working Papers

12. **Ke Yang**, Sebastian Schelter, Julia Stoyanovich, "FairImpact: On the Impact of Data Errors in Model Deployment - Experimental Analysis and Evaluation", in progress.
13. Meike Zehlike, **Ke Yang**, Julia Stoyanovich, "Fairness in Ranking: A Survey ", in submission, arXiv version.

## Teaching & Advising Experience

**Teaching assistant** at Drexel University

- Fundamentals of Databases (graduate level), Winter 2017
- Database Systems (undergraduate level), Spring 2017

**Research advisor** at New York University

- Jensine Raihan (BS in Computer Science), Fall 2020, "Ranking Facts in real datasets"
- Biao Huang (MS in Data Science), Spring 2020, "Fairness-aware instrumentation of preprocessing pipelines for machine learning"
- Samasth Norway Ananda (MS in Computer Science), Spring and Summer 2020, "FairPrep: promoting data to a first-class citizen in studies on fairness enhancing interventions"

## Academic Service

**Conference Organization**

- Technical chair: 4th Workshop on Data Management for End-to-End Machine Learning (DEEM) at SIGMOD 2020

**Program Committee Member**

- Extending Database Technology (EDBT) 2022
- ACM Conference on Fairness, Accountability, and Transparency (ACM FAccT) 2021
- Workshop on Responsible Recommendation (FAccTRec) 2021
- Workshop on Data Management for End-to-End Machine Learning (DEEM) at SIGMOD 2020, 2021

**External Reviewer**

- Ethics reviewer, NeurIPS 2021
- ACM Conference on Human Factors in Computing Systems (CHI) 2021
- Information Systems 2019

**Student volunteer**

- ACM Conference on Fairness, Accountability, and Transparency (ACM FAT*) 2019

## Awards, Fellowship, & Honors

- Pearl Brownstein Doctoral Research Award, Tandon School of Engineering, New York University, 2021
- Selected participant, ACM FAccT Ph.D. consortium, 2019
- Student scholarship, FAT* (previous ACM FAccT) 2018
- Fellowship for Doctoral Study, Beijing Technology and Business University, 2015
- Distinguished Master's Thesis Award, Graduate School, Beijing Technology and Business University, 2015