Ke Yang

PhD Candidate, Computer Science, New York University

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Education

Ph.D. in Computer Science, New York University 05.2021
- Advisor: Julia Stoyanovich, GPA 3.89
- Dissertation: Fairness, diversity, and interpretability of set-wise algorithmic outcomes
- Committee: Julia Stoyanovich (chair), Sebastian Schelter, Daniel Neill, and Oded Nov

Ph.D. in Computer Science, Drexel University 2015-2018
- Advisor: Julia Stoyanovich, GPA 3.98

M.S.E in Computer Science, Beijing Technology and Business University, 06.2015
- 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 06.2012
- Advisor: Qian Mo, GPA 3.45
- Graduated summa cum laude

Research Interests

human-centered data science,
data equity in Artificial Intelligence (AI) and Machine Learning (ML),
accountable data and model management system

- Design AI approaches for social good, with a particular focus on fairness, accountability, transparency, explainability, and the social impact of algorithms
- Build human-centered systems and techniques at the intersection of data management and machine learning (ML)
- Develop techniques to improve interpretation of automated systems' outputs without undue cognitive load, to calibrate trust in data, and to transform data into knowledge

Publications

Under submission

1. **Ke Yang**, Joshua R. Loftus, and Julia Stoyanovich, "Causal intersectionality for fair ranking"

Journals

1. 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), DOI:10.11897/SP.J.1016.2017.00939

2. 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), DOI:10.1504/IJES.2016.073747

3. Qian Mo, **Ke Yang**, "Overview of Web spammer detection" in *Journal of Software*, 25(7): 1505-1526 (2014) (in Chinese), DOI:10.13328/j.cnki.jos.004617

Peer-Reviewed Conference Proceedings

1. **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, DOI:10.24963/ijcai.2019/836

2. Julia Stoyanovich, **Ke Yang**, HV Jagadish, "Online Set Selection with Fairness and Diversity Constraints" in *Proceedings of the 21th International Conference on Extending Database Technology* (EDBT 2018), Vienna, Austria, DOI:10.5441/002/edbt.2018.22

3. **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, DOI:10.1145/3085504.3085526

Workshop Papers

1. **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

2. **Ke Yang**, Julia Stoyanovich, Abolfazl Asudeh, Bill Howe, HV Jagadish, and Gerome Miklau, "A Nutritional Label for Rankings" (demo) to appear in *Proceedings of the 2018 ACM International Conference on Management of Data* (SIGMOD 2018), Houston, USA

Patents

1. Kai Wang, **Ke Yang**, "A method and application system of detecting web spammers" in *China Invention Patent*, (2015) (in Chinese), No. CN201510012860

Professional Experience

Research Assistant, Tandon School of Engineering, New York University 2019-2021
Supervisor: Julia Stoyanovich
- Worked in Data, Responsibly to study the foundations of responsible data science and build tools that translate insights into data science practice. More details in `dataresponsibly.github.io`.

Research intern, AT&T Lab Research, New York 2019 Summer
Supervisors: Emily Dodwell, Ritwik Mitra, and Balachander Krishnamurthy
- Worked on a project to insure fairness and transparency for internal AT&T machine learning projects. This project aims to ensure that the projects' outcome meets reasonable guidelines for fairness without illegal bias and discrimination. We developed a diagnostic tool for bias-related issues that can be used by project managers and data scientists in AT&T.

Research Assistant, College of Computing & Informatics, Drexel University, 2015-2018
Supervisor: Julia Stoyanovich
- Worked in a project to model fair and diverse representation of individuals in subset selection and ranking process, and develop algorithms to ensure it with intersectional concerns in different applications.

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. In this project, we proposed a model to predict the probability of future flood 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 national watershed data management system.

Teaching & Advising Experience

Lab section leader at New York University
- Special Topics in Data Science: Responsible Data Science, 2019 Spring

Teaching assistant at Drexel University
- Fundamentals of Databases (graduate level), 2017 Winter
- Database Systems (undergraduate level), 2017 Spring

Research advisor at New York University
Independent Studies:
- Jensine Raihan, 2020 Fall, "Ranking Facts in real datasets"
- Biao Huang, 2020 Spring, "Fairness-aware instrumentation of preprocessing pipelines for machine learning"

Research assistant:
- Samasth Norway Ananda, 2020 Spring and Summer, "FairPrep: promoting data to a first-class citizen in studies on fairness enhancing interventions"

Academic Service

Conference Organizing Committee:
- Technical chair: Workshop on Data Management for End-to-End Machine Learning (DEEM) at SIGMOD 2020

Journal Review:
- Information Systems 2019

Conference Proceedings Review:
- ACM Conference on Fairness, Accountability, and Transparency (ACM FAccT) 2020
- Workshop on Data Management for End-to-End Machine Learning (DEEM) at SIGMOD 2020
- ACM Conference on Human Factors in Computing Systems (CHI) 2020

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

Talks

- Diversity in Set-wise Outcomes, 2019, AT&T Lab Research Weekly Symposium

- Fairness In Ranked Outputs, 2018, AT&T Research Graduate Student Symposium

Fellowships, Awards, & Honors

- A selected participant at ACM FAT* PhD consortium, 2019
- A selected participant at AT&T graduate student symposium, 2018
- Invited participant at Fairness in ML Workshop at Google, 2018
- Student Scholarship at ACM Conference on Fairness, Accountability, and Transparency (ACM FAT*) 2018
- Fellowship for Doctoral Study, Graduate School, Beijing Technology and Business University, 2015
- Dissertation Award, Graduate School, Beijing Technology and Business University, 2015