

Qing Wang

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RESEARCH INTERESTS

Large-Scale Data Mining; Machine Learning; Recommender System; Bandits; Large Language Models

EXPERIENCE

Industry Experience

- 2021.12-present **Sr. Data Scientist, *AI Acceleration Enterprises Data***, San Jose, CA, USA.
- Led the development of AI-based techniques for personal identification information (PII) detection on unstructured data, delivering support to IBM's M&A team.
 - Led in patenting and publishing research papers related on privacy AI and GenAI.
 - Collaborated with research teams to integrate their latest technologies in PII detection.
 - Maintained and optimized automated pipelines using BERT and spaCy to detect and remove PII from unstructured data.
 - Published two patents.
- 2019.3-2021.12 **Postdoctoral Researcher, *IBM T.J Watson Research Center***, New York, NY, USA.
- Designed and implemented AI models for Watson AIOps product, including event grouping model and fault localization model.
 - Facilitated problem diagnosis and determination, outage prediction, auto-resolution in complex IT environment by understanding the text description of IT ticket, identifying the temporal pattern from system events, and mining causality among system monitoring time series data.
 - Published eight top conference paper and 12 patents.
 - Received IBM Research Accomplishment Awards.
- 2018.5-2018.7 **Research Intern, *IBM T.J Watson Research Center***, New York, NY, USA.
- Proposed and implemented an interactive framework using bandit models for AI skill Orchestration.
 - Implemented a deep learning framework for text2SQL and published a related work "Learning Logical Representations from Natural Languages with Weak Supervision and Back Translation" on NeurIPS workshop, 2019.
 - Published a patent about Assessing technical risk in information technology service management.
- 2017.5-2017.7 **Research Intern, *IBM T.J Watson Research Center***, New York, NY, USA.
- Proposed a new online learning algorithm, a hierarchical multi-armed bandit algorithm for the IT automation recommendation;
 - Implemented these online algorithms and conducted comparative experiments on a large-scale real ticket dataset collected from IBM Global Services.
 - Published the related work in the proceedings of SIAM International Conference on Data Mining, 2018.
- 2016.6-2016.8 **Research Intern, *IBM T.J Watson Research Center***, New York, NY, USA.
- Proposed an integrated framework for the ticket resolution recommendation.
 - Constructed a domain knowledge base using ontology modeling techniques.
 - Published the related work in the proceedings of IEEE International Conference on Services Computing, 2017 (**Best Student Paper**)

Academic Experience

- 2015.8-2018.12 **Research Assistant, *Knowledge Discovery Research Group***, FIU, USA.
- **Multi-Armed Bandit.** Designed and implemented multi-armed bandit algorithms to address online interactive recommendation problem, where the interaction between users and items can be better tracked.
 - **Event Mining.** Designed and implemented a **frequent-itemset mining module** of the online Event Mining system. This module is able to discover some interesting frequent patterns from event data.

PROGRAMMING SKILLS

Languages: Python, Java

Frameworks: Pytorch

DB: DB2, MySQL, Redis

Tools: Git, SVN

SELECTED PUBLICATIONS

Selected Articles in Refereed Journals

1. **Qing Wang**, Chunqiu Zeng, Wubai Zhou, Tao Li, S. S. Iyengar, Larisa Shwartz, Genady Ya. Graharnik, “Online Interactive Collaborative Filtering Using Multi-armed Bandit with Dependent Arms”, IEEE Transactions on Knowledge and Data Engineering (IEEE TKDE), 2018.

Selected Conferences Proceedings Papers

2. **Qing Wang**, Jesus Rios Aliaga, Karthikeyan Shanmugam, et. al "Fault Injection based Interventional Causal Learning for Distributed Applications", 37th AAAI Conference on Artificial Intelligence (AAAI-23), 2023.
3. **Qing Wang**, Larisa Shwartz, Genady Ya. Grabarnik, Vijay Arya, Karthikeyan Shanmugam, “Detecting Causal Structure on Cloud Application Microservices Using Granger Causality Models”, IEEE 14th International Conference on Cloud Computing (CLOUD 2021).
4. **Qing Wang**, Larisa Shwartz, Genady Ya. Graharnik, Michael Nidd, Jinho Hwang. “Leveraging AI in Service Automation Modeling: from Classical AI Through Deep Learning to Combination Models”, International Conference on Service-Oriented Computing (ICSOC 2019). Springer, Toulouse, France, 2019.
5. Kaylin Hagopian, **Qing Wang**, Yupeng Gao, Tengfei Ma, Lingfei Wu. “Learning Logical Representations from Natural Languages with Weak Supervision and Back Translation”, Knowledge Representation & Reasoning Meets Machine Learning Workshop at NeurIPS, Vancouver, Canada, 2019.
6. **Qing Wang**, Chunqiu Zeng, S. S. Iyengar, Tao Li, Larisa Shwartz, Genady Ya. Graharnik, “AISTAR: An Intelligent System for Online IT Ticket Automation Recommendation”, IEEE International Conference on Big Data (IEEE BigData 2018), Seattle, Washington, USA, 2018.
7. **Qing Wang**, Tao Li, S. S. Iyengar, Larisa Shwartz, Genady Ya. Graharnik, “Online IT automation recommendation Using Hierarchical Multi-armed Bandit Algorithms”, SIAM International Conference on Data Mining (SDM 2018), San Diego, California, USA, 2018.
8. **Qing Wang**, Wubai Zhou, Chunqiu Zeng, Tao Li, Larisa Shwartz, Genady Ya. Graharnik, “Constructing the Knowledge Base for Cognitive IT Service Management”, IEEE International Conference on Services Computing (IEEE SCC 2017), Honolulu, Hawaii, USA, 2017. [**Best Student Paper Award**]
9. Chunqiu Zeng, **Qing Wang**, Shekoofeh Mokhtari, Tao Li, “Online Context-Aware Recommendation with Time Varying Multi-Armed Bandit”, ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (ACM SIGKDD 2016), San Francisco, California, USA, 2016.

Selected Patents

1. ANOMALY DETECTION USING EVENT SEQUENCE PREDICTION, 2024.
2. Learning Causal Relationships, 2023.
3. Fault localization in a distributed computing system, 2023.
4. Transformation of data from legacy architecture to updated architecture, 2023.
5. Synthetic system fault generation, 2023.
6. Automatic mapping of records without configuration information, 2023.
7. Shiftright topology construction and information augmentation using machine learning, 2022. [High Value Patent]
8. Computing system event error corrective action recommendation, 2022.
9. Linking operational events with system changes, 2022.
10. Just in time assembly of transactions, 2022.
11. Application topology discovery, 2022. [High Value Patent]
12. Cross-Environment Event Correlation Using Domain-Space Exploration and Machine Learning Techniques, 2022. [High Value Patent]
13. Assessing technical risk in information technology service management using visual pattern recognition, 2022.

SERVICE ACTIVITIES

Served as a Program Committee (PC) member for conferences and journals like SIGKDD, AAAI, CIKM, ICDM, PKDD, and JMLR from 2016.

Honors & Awards

1. IBM Research Accomplishment Awards. (Nov. 2021)

2. IBM Outstanding Technical Achievement Awards. (May. 2021)
3. FIU SCIS Overall Outstanding Graduate Student Award. (Nov. 2018)

Education

- 2014.8-2018.12 **Ph.D. in Computer Science**, *Florida International University*, Miami, FL, U.S.A..
Dissertation: Intelligent Data Mining Techniques for Automatic Service Management.
- 2010.8-2013.5 **M.E. in Computer Science**, *Xidian University*, Xi'an, Shaan'xi, China.
Information Security
- 2005.8-2009.6 **B.S. in Computer Science**, *Zhengzhou University*, Zhengzhou, Henan, China.
GPA: 3.6/4.0