Qing Wang CS, Ph.D.

"Success is the ability to go from failure to failure without losing your enthusiasm." – Winston Churchill

RESEARCH INTERESTS

Large-Scale Data Mining; Machine Learning; Multi-armed Bandits; Causality Inference; Large Language Models

EDUCATION

2014.08- **Ph.D. in Computer Science**, *Florida International University*, Miami, FL, 2018.12 U.S.A..

Dissertation: Intelligent Data Mining Techniques for Automatic Service Management.

- 2010.08- M.E. in Computer Science, Xidian University, Xi'an, Shaan'xi, China. 2013.05 Cybersecurity
- 2005.08- B.S. in Computer Science, Zhengzhou University, Zhengzhou, Henan, China.
 2009.06 Computer Science

EXPERIENCE

ACADEMIC EXPERIENCE

- 2025.05- **Research Associate**, School of Computing and Data Sciences, The University present of Hong Kong, Hong Kong, China.
 - Reward Modeling for Large Language Modelings Pretraining.
- 2014.08- Teaching Assistant, School of Computing and Information Sciences, Florida
- 2016.05 International University, Miami, USA.
 - 2014.8-2014.12 COP 4772 Principle of Database.
 - $\circ~2015.2\mathchar`-2015.5$ TCN 5010 Telecommunications Technology and Applications.
 - $\circ~2015.8\mathchar`-2015.12$ COP 2210 Java Programming I.
 - 2016.2-2016.5 CAP 4770 Introduction to Data Mining.
- 2015.08- **Research Assistant**, *Knowledge Discovery Research Group*, Florida Internati-2018.12 onal University, Miami, 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.

INDUSTRY EXPERIENCE

2024.04- Senior Data Scientist, IBM Silicon Valley Lab, San Jose, CA, USA.

- 2025.04 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 Generative AI.
 - 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.

2019.03- Postdoctoral Researcher, IBM T.J Watson Research Center, Yorktown

- 2024.04 Heights, 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.
 - collaborated with MIT-IBM Watson AI Lab on circuit generation based on graph neural network.
 - Published eight top conference paper and 15 patents.
 - Received IBM Research Accomplishment Awards (IBM Watson AIOps Launch).
 - Received IBM Outstanding Technical Achievement Award.

2018.05- Research Intern, *IBM T.J Watson Research Center*, Yorktown Heights, 2018.07 NY, USA.

- Collaborated with two AI Science teams on two AI challenges including 1) Building learning Models for AI Skill Orchestration: aiming to utilize bandit algorithms for interactive skills planning. 2) Learning Logical Representations of Natural Languages with Little Supervision: aiming to learn the logic forms from natural language using deep learning and reinforcement learning techniques.
- 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.

2017.05- Research Intern, *IBM T.J Watson Research Center*, Yorktown Heights, 2017.07 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.

2016.06- Research Intern, *IBM T.J Watson Research Center*, Yorktown Heights, 2016.08 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)
- 2011.08- Software Engineer Intern, Collaboration And Deployment Services 2012.05 Team(CADS), IBM SPSS, Xi'an, Shaan'xi, China.
 - Designed and implemented an automatic testing framework for CADS platform using IBM Rational Functional Tester. This framework can help customize test cases with a XML configuration file, and execute them automatically.
 - Implemented a control locating component, an action verifying component, and the XML parser component.

SELECTED PUBLICATIONS

PAPER AWARDS

1. Best student paper award at the 2017 IEEE International Conference on Services Computing (IEEE SCC 2017); Conf paper: Q. Wang, W. Zhou, C. Zeng, T. Li, L. Shwartz and G. Y. Graharnik. "Constructing the Knowledge Base for Cognitive IT Service Management."

SELECTED ARTICLES IN REFEREED JOURNALS

- 1. Qifeng Zhou, Xiang Liu, **Qing Wang**. "Interpretable Duplicate Question Detection Models based on Attention Mechanism", Information Sciences, 2020.
- 2. Qing Wang, "Intelligent Data Mining Techniques for Automatic Service Management" (2018), FIU Electronic Theses and Dissertations. 3883.
- 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.
- 4. Tao Li, Chunqiu Zeng, Wubai Zhou, Wei Xue, Yue Huang, Zheng Liu, Qifeng Zhou, Bin Xia, **Qing Wang**, Wentao Wang, Xiaolong Zhu. "FIU-Miner (a fast, integrated, and user-friendly system for data mining) and its applications", Knowledge and Information Systems (KIAS), 2016.

SELECTED CONFERENCES PROCEEDINGS PAPERS

- Xinxi Jiang, Xiang Li, Qifeng Zhou, Qing Wang. "GRACE: Generating Cause and Effect of Disaster Sub-Events from Social Media Text", The 2024 ACM Web Conference (WWW-24), Singapore, Singapore, 2024
- Shen Yang, Qifeng Zhou, Qing Wang. "Clustering of Bandit with Frequence-Dependent Information Sharing", 45th European Conference on Information Retrieval (ECIR-23), Dublin, Ireland, 2023
- 3. 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), Washington, DC, USA, 2023.
- 4. Qing Wang. "The Use of Banidt Algorithms in Intelligent Interactive Recommender Systems", arXiv:2107.00161, 2021.
- 5. 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).

- Jinho Hwang, Larisa Shwartz, Qing Wang, Raghav Batta, Harshit Kumar, Michael Nidd. "Fixme: Enhance software reliability with hybrid approaches in cloud", IEEE/ACM 43rd International Conference on Software Engineering: Software Engineering in Practice (ICSE-SEIP 2021).
- 7. Pooja Aggarwal, Seema Nagar, Ajay Gupta, Larisa Shwartz, Prateeti Mohapatra, Amit Paradkar, **Qing Wang**, Atri Mandal. "Causal Modeling based Fault Localization in Cloud Systems using Golden Signals", 14th International Conference on Cloud Computing (IEEE CLOUD 2021).
- 8. Vijay Arya, Karthikeyan Shanmugam, Pooja Aggarwal, **Qing Wang**, Prateeti Mohapatra and Seema Nagar. "Evaluation of Causal Inference Techniques for AIOps", 8th ACM IKDD CODS and 26th COMAD (CODS-COMAD 2021).
- 9. Pooja Aggarwal, Ajay Gupta, Prateeti Mohapatra, Seema Nagar, Atri Mandal, **Qing Wang**, Amit Paradkar. "Localization of Operational Faults in Cloud Applications by Mining Causal Dependencies in Logs using Golden Signals", AIOPs of the 18th International Conference on Service-Oriented Computing (ICSOC 2020).
- 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.
- 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.
- 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.
- 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.
- 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]
- 15. Wubai Zhou, Wei Xue, Ramesh Baral, Qing Wang, Chunqiu Zeng, Tao Li, Jian Xu, Zhen Liu, Larisa Shwartz, Genady Ya. Graharnik. "STAR: A System for Ticket Analysis and Resolution", ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (ACM SIGKDD 2017), Halifax, Nova Scotia, Canada, 2017.
- Wei Xue, Wubai Zhou, Tao Li, Qing Wang. "MTNA: A Neural Multi-Task Model for Aspect Category Classification and Aspect Term Extraction on Restaurant Reviews", International Joint Conference on Natural Language Processing (IJCNLP 2017), Taipei, Taiwan, 2017.
- 17. 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.

- 18. Tao Li, Wubai Zhou, Chunqiu Zeng, Qing Wang, Qifeng Zhou, Dingding Wang, Yue Huang, Jia Xu, Wentao Wang, Minjing Zhang, Steve Luis, Shu-Ching Chen and Naphtali Rishe. "DI-DAP: An Efficient Disaster Information Delivery and Analysis Platform in Disaster Management", ACM International Conference on Information and Knowledge Management (ACM CIKM 2016), Indianapolis, Indiana, USA, 2016.
- 19. Chunqiu Zeng, **Qing Wang**, Wentao Wang, Tao Li, Larisa Shwartz. "Online Inference for Time-varying Temporal Dependency Discovery from Time Series", IEEE International Conference on Big Data (IEEE Big Data 2016), Washington D.C., USA, 2016.

SELECTED PATENTS

- 1. Graph Grammar Learning for Automatic Circuit Generation, 2025.
- 2. Anomaly Detection Using Event Sequence Prediction, 2024.
- 3. Fault localization in a distributed computing system, 2025.
- 4. Shiftleft topology construction and information augmentation using machine learning, 2025. [High Value Patent]
- 5. Just in time assembly of transactions, 2024.
- 6. Learning Causal Relationships, 2023.
- 7. Transformation of data from legacy architecture to updated architecture, 2023.
- 8. Synthetic system fault generation, 2023.
- 9. Automatic mapping of records without configuration information, 2023.
- 10. Computing system event error corrective action recommendation, 2022.
- 11. Linking operational events with system changes, 2022.
- 12. Application topology discovery, 2022. [High Value Patent]
- 13. Cross-Environment Event Correlation Using Domain-Space Exploration and Machine Learning Techniques , 2022. [High Value Patent]
- 14. Assessing technical risk in information technology service management using visual pattern recognition. 2022

TALKS

- 1. "GRACE: Generating Cause and Effect of Disaster Sub-Events from Social Media Text", Demo presentation. WWW 2024, Singapore, Singapore. (May., 2024).
- "Fault-injection based Causal Learning for Cloud Applications", SREconference@IBM 2021. (Nov.,2021).
- 3. "Detecting Causal Structure on Cloud Application Microservices Using Granger Causality Models", IEEE CLOUD 2021. (Sep., 2021).
- "Taking Digital Service by Storm: from Traditional AI to Deep AI", 'Five Minute Madness' presentation, 2019 IBM Northeast Region Academy Affiliates Face-to-Face Meeting. (Jun.,2019).
- 5. "AISTAR: An Intelligent Integrated System for Online IT Ticket Automation Recommenda-

tion", oral presentation, IEEE BigData 2018, Seattle, WA, USA, Dec., 2018.

- "STAR: A System for Ticket Analysis and Resolution," SIGKDD, Halifax, Canada, Aug.13-17, 2017.
- "An Integrated Solution for Ontology-based Ticket Recommendation Using Problem Inference," IBM Intern Workshop, Yorktown Heights, NY, Jun. 20-23, 2016

SERVICE ACTIVITIES

- 1. Served as a session chair of 2018 IEEE Big Data.
- 2. Served as a session chair of 2021 ICSOC.
- 3. Reviewer, SIGKDD, CIKM, ICDM, ECIR, AAAI, IJACAI, EMNLP, 2016-2018.
- 4. PC member 2020, CIKM, DSHealth(SIGKDD Workshop), DLG(SIGKDD Workshop).
- 5. PC member 2021, AAAI, CIKM, DSHealth(KDD Workshop), ICSOC, TNSM.
- 6. PC member 2022, AAAI, CIKM, PKDD, DSHealth(KDD Workshop).
- 7. PC member 2023, CIKM, JAIR.
- 8. PC member 2024, CIKM. JAIR.

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)
- 4. FIU Dissertation Year Fellowship. (Aug. 2018)
- 5. SIAM Student Travel Award. (May. 2018)
- 6. IEEE SCC Best Student Paper Award. (Jun. 2017)
- 7. SIGKDD Student Travel Award. (Jul. 2017)

PROGRAMMING SKILLS

Languages:Python, Java, LatexFrameworks:Pytorch, tensorflowDB:DB2, MySQL, RedisTools:Git