

XIN ZAN

Ph.D. Candidate, Department of Industrial and Systems Engineering, University of Florida

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EDUCATION

Ph.D. Industrial and Systems Engineering, University of Florida, expected Spring 2024

- Advisor: Dr. Xiaochen Xian.
- Dissertation Title: “Structured Data Analysis with Weak Supervision in Healthcare Applications”.

M.S. Statistics, University of Florida, Spring 2022

B.S. Industrial Engineering, Shanghai Jiao Tong University, China, June 2019

- Honors Degree.

RESEARCH INTERESTS

Statistical and machine learning with weak supervision; Knowledge-enhanced deep learning; Spatial analysis and modeling; Causal inference; Statistical process control; Adaptive sampling and resource allocation; Health informatics and healthcare systems engineering.

PUBLICATIONS

1. **Xin Zan**, Di Wang, and Xiaochen Xian (2023), “Spatial Rank-Based Augmentation for Nonparametric Online Monitoring and Adaptive Sampling of Big Data Streams”, *Technometrics*, 65(2), 243-256. DOI: <https://doi.org/10.1080/00401706.2022.2143903>.
 - Feature Article in *Advances In Engineering (AIE)*.
2. **Xin Zan**, Jaclyn Hall, Tom Hladish, and Xiaochen Xian (2023), “Data-driven Adaptive Testing Resource Allocation Strategies for Real-time Monitoring of Infectious Diseases”, *IISE Transactions*, in press. DOI: <https://doi.org/10.1080/24725854.2023.2266488>.
 - Third Place Winner of the 2022 COVID Information Commons (CIC) Student Paper Challenge. (Invited for presentation in CIC Webinar and NEBDHub Student Research Symposium.)
 - Honorable Mention of the Best Student Poster Competition in Quality, Statistics and Reliability (QSR) Section of 2022 INFORMS Annual Meeting.
 - Finalist of the Best Paper Competition in Quality Control & Reliability Engineering (QCRE) Track of IISE Annual Conference and Expo 2022.

3. **Xin Zan**, Alexander Semenov, Chao Wang, Xiaochen Xian, and Wondi Geremew (2024), “Causality-aware Social Recommender System with Network Homophily Informed Multi-Treatment Confounders”, *Information Sciences*, under revision.
4. **Xin Zan**, Di Wang, Changyue Song, Feng Liu, Xiaochen Xian, and Richard Berry, “Weakly Supervised Deep Learning for Monitoring Sleep Apnea Severity Using Coarse-grained Labels”, *IEEE Journal of Biomedical and Health Informatics*, under review.
 - Invited for oral presentation at the 18th INFORMS Data Mining and Decision Analytics (DMDA) Workshop.
5. **Xin Zan**, Feng Liu, Xiaochen Xian, and Panos Pardalos, “Empowering Sleep Health: Unleashing the Potential of Artificial Intelligence and Data Science in Sleep Disorders”, In *Handbook of AI and Data Sciences for Sleep Disorders*, Springer Optimization and its Applications, under revision.
6. **Xin Zan**, Minhee Kim, Changyue Song, Feng Liu, Xiaochen Xian, and Richard Berry, “A Dual-granularity Bayesian Active Learning Framework with Uncertainty Quantification for Sleep Apnea Severity Estimation”, *IEEE Transactions on Automation Science and Engineering*, to be submitted.
7. **Xin Zan**, Dongmin Li, and Xiaochen Xian, “Layer-wise Spatial Modeling and With-layer In-situ Monitoring for Additive Manufacturing Processes”, *Journal of Quality Technology*, to be submitted.
 - Finalist of the QSR Data Challenge Competition at 2021 INFORMS Annual Meeting.
8. Minhee Kim, **Xin Zan**, and Xiaochen Xian, “A Probabilistic Perspective: Bayesian Neural Network for Sleep Apnea Detection”, In *Handbook of AI and Data Sciences for Sleep Disorders*, Springer Optimization and its Applications, under revision.

MAJOR HONORS AND AWARDS

- **Certificate of Outstanding Merit**, UF International Center, University of Florida, 2023
- **Feature Article** in Advances In Engineering (AIE), “Spatial Rank-Based Augmentation for Nonparametric Online Monitoring and Adaptive Sampling of Big Data Streams”, 2023
- **Linda Parker Hudson Graduate Fellowship**, ISE Department, University of Florida, 2023
- **Third Place Winner**, COVID Information Commons (CIC) Student Paper Challenge, 2022
- **Best Student Poster Award (Honorable Mention)**, Quality, Statistics and Reliability (QSR) Section, INFORMS Annual Meeting, 2022
- **Best Paper Award (Finalist)**, Quality Control & Reliability Engineering (QCRE) Track, IISE Annual Conference and Expo, 2022
- **QSR Data Challenge Competition (Finalist)**, INFORMS Annual Meeting, for the work “Additive Manufacturing Process Monitoring by Mixed-Effects Modeling”, 2021

RESEARCH EXPERIENCE

Graduate Assistant, Department of Industrial and Systems Engineering, University of Florida, Fall 2019 – present.

- Advisor: Dr. Xiaochen Xian
- Nonparametric monitoring and sampling of big data streams
 - Proposed data augmentation techniques for incomplete streaming data based only on partial observability.
 - Developed adaptive sampling strategies that actively determine which data streams to observe subject to resource constraints.
 - Developed nonparametric online monitoring of general heterogenous and correlated big data streams for quick change detection.
- Physics-informed process modeling and monitoring of infectious diseases
 - Developed a physics-informed model accounting for transmission dynamics and health disparities for infection progress modeling and health risk assessment.
 - Proposed data-driven allocation strategies that strategically allocate limited testing resources for quick detection of disease outbreaks.
- Knowledge-enhanced deep learning for disease diagnosis
 - Developed a weakly supervised deep learning framework for automatic sleep apnea detection using coarse-gained labels.
 - Proposed a mathematical encoding of clinical domain knowledge to enhance quick and precise diagnosis of sleep apnea.
- Causality-aware social recommender systems
 - Developed multiple causal inference techniques to enhance recommendations in social recommender systems.
 - Leveraged social network homophily information in networked observational data to capture multi-treatment confounders for mitigating confounding bias.

Visiting Student, School of Data Science, the Chinese University of Hong Kong, Shenzhen, China, July 2018 – August 2018.

- Advisor: Dr. Jim Dai
- Uber driver-passenger matching strategy
 - Explored reinforcement learning techniques to match Uber drivers and passengers.
 - Simulated the arrival and departure processes of vehicles and customers to optimize the matching.

TEACHING EXPERIENCE

Instructor, ESI 6616 “Data Analytics for System Monitoring”, Department of Industrial and Systems Engineering, University of Florida, graduate level, Fall 2022.

- Ph.D. Qualifying Exam course; M.S. Data Analytics elective

- Evaluation 4.0/5.0 (10/10 Students)
 - Prepared and delivered all lectures; Designed and graded homework and exams; Mentored students' term projects; Enriched the course by inviting guest lecturers from ISE and BME departments.

MENTORING EXPERIENCE

Undergraduate Students

- Nicolli DeCastro-Pedro, ISE (August 2023 – November 2023)
 - Project: Sleep artifact detection.
- Ali Hussain, Data Science (January 2021 – April 2021)
 - Project: Sleep apnea monitoring.

PRESENTATIONS

Invited Talks

- “Nonparametric Online Monitoring and Adaptive Sampling for Correlated Data Streams”, 2020 INFORMS Annual Meeting, November 2020, Virtual.
- “Data-driven Adaptive Testing Resource Allocation Strategies for Real-time Monitoring of Infectious Diseases”, IISE Annual Conference and Expo 2022, May 2022, Seattle, WA.
- “Data-driven Adaptive Testing Resource Allocation Strategies for Real-time Monitoring of Infectious Diseases”, 2022 INFORMS Annual Meeting, October 2022, Indianapolis, IN.
- “Data-driven Adaptive Testing Resource Allocation Strategies for Real-time Monitoring of Infectious Diseases”, 2023 Northeast Big Data Innovation Hub (NEBDHub) Student Research Symposium, January 2023, Virtual.
- “Data-driven Adaptive Testing Resource Allocation Strategies for Real-time Monitoring of Infectious Diseases”, Summer 2023 COVID Information Commons (CIC) Research Lightning Talks Webinar, July 2023, Virtual.
- “Weakly Supervised Deep Learning for Monitoring Sleep Apnea Severity Using Coarse-Grained Labels”, 18th INFORMS Data Mining and Decision Analytics (DMDA) Workshop, October 2023, Phoenix, AZ.
- “Spatial Rank-Based Augmentation for Nonparametric Online Monitoring and Adaptive Sampling of Big Data Streams”, 2023 INFORMS Annual Meeting, October 2023, Phoenix, AZ.
- “Weakly Supervised Deep Learning for Monitoring Sleep Apnea Severity Using Coarse-Grained Labels”, 2023 INFORMS Annual Meeting, October 2023, Phoenix, AZ.

Poster Presentations

- “Spatial Rank-Based Augmentation for Nonparametric Online Monitoring and Adaptive Sampling of Big Data Streams”, Warren B. Nelms Institute, University of Florida, January 2022, Gainesville, FL.
- “Data-driven Adaptive Testing Resource Allocation Strategies for Real-time Monitoring of Infectious Diseases”, 2022 INFORMS Annual Meeting, October 2022, Indianapolis, IN.
- “Weakly Supervised Deep Learning for Monitoring Sleep Apnea Severity Using Coarse-Grained Labels”, 2023 INFORMS Annual Meeting, October 2023, Phoenix, AZ.

PROFESSIONAL SERVICES AND ACTIVITIES

Referee Services

- IEEE Transactions on Automation Science and Engineering (T-ASE).
- IEEE Robotics and Automation Letters (RA-L).
- IEEE International Conference on Automation Science and Engineering (C-ASE).
- Data Analytics and Information Systems (DAIS) Best Paper Competition, IISE Annual Conference and Expo.

Professional Membership

- Member of INFORMS, IISE.

Conference Organizing Activities

- Session Chair, “Big Data Analytics and Data-Driven Decision Making”, IISE Annual Conference and Expo 2022, May 2022, Seattle, WA.
- Session Chair, “Big Data Analytics and Data-Driven Decision-making”, 2022 INFORMS Annual Meeting, October 2022, Indianapolis, IN.
- Session Chair, “Structured Data Analysis in Healthcare Applications”, 2023 INFORMS Annual Meeting, October 2023, Phoenix, AZ.

Outreach Activities

- Judge, High School Students Research Poster Competition, Florida Regional Junior Science, Engineering, and Humanities Symposium (JSEHS), University of Florida, January 2023, Gainesville, FL.
 - K-12 Education Outreach