Jiajing (Horatio) Huang, Ph.D.

School of Data Science and Analytics
College of Computing and Software Engineering
Kennesaw State University
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EDUCATION

Data Science, Analytics and Engineering, Ph.D. 08/2024
Arizona State University, Tempe, AZ, USA
Dissertation: An Information-theoretical Framework for Data-driven Building Automatic Fault Detection and Diagnosis Support (Advisor: Prof. Teresa Wu)

Industrial Engineering, M.S. 12/2020
Arizona State University, Tempe, AZ, USA

Statistics, M.S. 05/2018
Rutgers, the State University of New Jersey, New Brunswick, NJ, USA

Materials Science and Engineering, B.S. 07/2013
Shenzhen University, Shenzhen, Guangdong, P.R. China

Research Interests

- AI and machine learning-driven decision-making support for intelligent systems engineering (smart buildings, energy-efficient grids)
- Advanced statistical modeling and machine learning applications in healthcare (health informatics, clinical trials and disease diagnosis)

SKILLS

Data Science	Machine Learning (Supervised/Unsupervised/Semi-supervised/Active Learning), Deep learning (CNN, GNN), Causal Learning (Causal Inference, Causal Reasoning, Causal Modeling), Statistical Inference (Hypothesis Testing), Data Visualization (D3, matplotlib), Signal Processing
Programming	Python, Scikit-learn, Keras/Tensorflow, PyTorch, Matlab, SAS, R, HTML/CSS/JavaScript, Git
Software	MySQL, PostgreSQL, SPSS, Spark, Hadoop, Map/Reduce, GCP, Tableau, Azure

PROFESSIONAL EXPERIENCE

Assistant Professor of Data Science and Analytics 01/2025-Present
School of Data Science and Analytics, Kennesaw State University, Marietta, GA, USA

Graduate Research Associate / Visiting Scholar 08/2018-12/2024
ASU-Mayo Center for Innovative Imaging, Tempe, AZ, USA

Ph.D. Intern – Buildings Research 06/2022-08/2022
Pacific Northwest National Laboratory (PNNL), Richland, WA, USA

Research Assistant 09/2017-05/2018
The Cardiovascular Institute of New Jersey, New Brunswick, NJ

Trainee Consultant 10/2013-10/2014
Productivity (Shenzhen) Consulting Co., Ltd., Shenzhen, Guangdong, P.R. China

HONORS & AWARDS

Graduation Convocation Fulton Schools Gonfalon Bearer, Arizona State University	2024
Best Student Award Finalist, 2024 IEEE CASE	2024
Graduate College Completion Fellowship, Arizona State University	2024
SCAI Doctoral Fellowship, Arizona State University	2023
2022-23 Graduate College Travel Award, Arizona State University	2022 & 2023
Data Analytics Competition Finalist, 2022 IISE Annual Conference & Expo	2022
GPSA Travel Award, Arizona State University	2022 & 2023
SCAI Travel Award, Arizona State University	2022 & 2023
2021-22 Graduate College Travel Award, Arizona State University	2021 & 2022
Best Paper Award Finalist (DAIS Track), 2022 IISE Annual Conference & Expo	2021
2020-21 Graduate College Travel Award, Arizona State University	2021
CIDSE Doctoral Fellowship, Arizona State University	2018
University Scholarship (Academic Performance), Shenzhen University	2011
University Scholarship (Social Services), Shenzhen University	2011

PUBLICATIONS

Journal Papers

- **J. Huang**, N. Ghalamsiah, A. Patharkar, O. Pradhan, M. Chu, T. Wu, J. Wen, Z. O'Neill and K. S. Candan, "An entropy-based causality framework for cross-level fault diagnosis and isolation in building HVAC systems," *Energy and Buildings*, vol. 317, pp. 114378, 2024. (Impact Factor: 6.7)
- G. Li, L. Ren, O. Pradhan, J. Wen, Z. Yang, Y. Fu, M. Chu, **J. Huang**, T. Wu, K. S. Candan, V. Adetola, and Q. Zhu, "Emulation and detection of physical faults and cyber-attacks on building energy systems through real-time hardware-in-the-loop experiments," *Energy and Buildings*, vol. 320, pp. 114596, 2024. (Impact Factor: 6.7)
- O. Pradhan, D. Halleberg, Z. Chen, J. Wen, N. Varman, **J. Huang**, T. Wu, K.S. Candan, and Z. O'Neill, "Evaluation of Data Imputation Approaches for Multi-Stream Building Systems Data," *Science and Technology for the Built Environment*, vol. 30, no. 8, pp. 10351048, 2024.
- A. Patharkar, **J. Huang**, T. Wu, E. Forzani, L. Thomas, M. Lind, N. Gades, "Eigen-Entropy based Time Series Signatures to Support Multivariate Time Series Classification," *Scientific Reports*, vol 14, no. 1, pp. 16076, 2024.
- **J. Huang**, H. Yoon, T. Wu, K.S. Candan, O. Pradhan, J. Wen and Z. O'Neill, "Eigen-Entropy: A metric for multivariate sampling decisions," *Information Sciences*, vol. 619, pp. 84-97, 2023. (Impact Factor: 8.1)
- **J. Huang**, H. Yoon, O. Pradhan, T. Wu, J. Wen, Z. O'Neill and K.S. Candan, "A Cosine-based Correlation Information Entropy Approach for Building Automatic Fault Detection Baseline Construction," *Science and Technology for the Built Environment*, vol. 28, no. 9, pp. 1138-1149, 2022.
- **J. Huang**, J. Wen, H. Yoon, O. Pradhan, T. Wu, Z. O'Neill and K.S. Candan, "Real vs. Simulated: questions on the capability of simulated datasets on building fault detection for energy efficiency from a data-driven perspective," *Energy and Buildings*, vol. 259, pp. 111872, 2022. (Impact Factor: 6.7)

Conference Proceedings

- **J. Huang**, A. Patharkar, T. Wu, J. Wen, Z. O'Neill and K. S. Candan, "A feature extraction framework with entropy on graphs for cross-dataset building fault detection," in *Proceedings of 2024 IEEE 20th International Conference on Automation Science and Engineering*, 2024, pp. 2067-2072. (***This paper is awarded Finalist in IEEE CASE Best Student Paper Award***.)
- **J. Huang**, Z. Yang, G. Li, T. Wu, Z. O'Neill, J. Wen and K. S. Candan, "A Data-driven AFDD Approach Using Acoustic Emission In Building HVAC Systems," in *Proceedings of International High Performance Buildings Conference*, 2024, p. 432.
- **J. Huang**, T. Li, Y. Xu, T. Wu, H. Yoon, J.R. Charlton and K.M. Bennett, "EE-SMOTE: An oversampling method in conjunction with information entropy for imbalanced learning," in *Proceedings of 2022 IISE Annual Conference*, 2022, pp. 1-6.
- **J. Huang**, T. Wu, H. Yoon, O. Pradhan, J. Wen and Z. O'Neill, "Automatic Fault Detection Baseline Construction for Building HVAC Systems using Joint Entropy and Enthalpy, " in *Proceedings of 2021 IISE Annual Conference*, 2021, pp.536-541. (***This paper is awarded Finalist in IISE Annual Conference (DAIS Track) Best Paper Award***.)

Dissertation

- **J. Huang**, "An information-theoretical framework for data-driven building automatic fault detection and diagnosis support," Ph.D. Dissertation, SCAI, Arizona State Univ., Tempe, AZ, USA, 2024.

Technical Report

- Z. O'Neill, J. Wen, T. Wu, K.S. Candan, L. Ren, Q. Zhu, G. Li, **J. Huang**, and O. Pradhan. "Securing Grid-interactive Efficient Buildings (GEB) through Cyber Defense and Resilient System (CYDRES)," USDOE Office of Energy Efficiency and Renewable Energy (EERE), Washington, DC, USA, Tech. Rep. DOE-TAMU-EE9150_Final, 2024. [Online]. Available: https://doi.org/10.2172/2331215.

Working Papers

- "EE-GFE: An information-entropy graph-based feature extraction approach for cross-datasets fault detection in building HVAC systems," to be submitted to *Building and Environment*.
- "An entropy-based feature extraction on fMRI graphs for cognitive disease classification," TBD

INVITED PRESENTATIONS

- Invited Presentation, "EE-SFE: An Entropy-based Feature Extraction Framework on Subgraphs for Cognitive Disease Classification", 2024 INFORMS Annual Meeting, Oct. 21, 2024, Seattle, WA.
- Invited Presentation, "A Feature Extraction Framework with Entropy on Graphs for Cross-dataset Building Fault Detection", 2024 IEEE 20th International Conference on Automation Science and Engineering, Aug. 30, 2024, Bari, Italy.
- Invited Presentation, "A Data-driven AFDD Approach Using Acoustic Emission In Building HVAC Systems", the 8th International High Performance Buildings Conference, Jul. 16, 2024, West Lafayette, IN.
- Invited Presentation, "An Informatics Framework for Decision-Making Support", CSIE 2023 & the13th CIEDH, Hong Kong University of Science and Technology (Guangzhou), Aug. 11, 2023, Guangzhou, Guangdong, China.
- Invited Talk, "An Informatics Framework for Decision-Making Support", Nanjing University of Science and Technology, Jun. 20, 2023, Nanjing, Jiangsu, China.
- Invited Presentation, "A Cosine-based Correlation Information Entropy Approach for Building Automatic Fault Detection Baseline Construction", 2023 ASHRAE Winter Conference, Feb. 6, 2023, Atlanta, GA.
- Invited Presentation, "EE-SMOTE: An Oversampling Method in Conjunction with Information Entropy for Imbalanced Learning", 2022 IISE Annual Conference & Expo, May 22, 2022, Seattle, WA.
- Invited Presentation, "Eigen-entropy: A Metric For Sampling Design", 2021 INFORMS Annual Meeting, Oct. 25, 2021, Virtual.
- Invited Presentation, "Automatic Fault Detection Baseline Construction for Building HVAC Systems using Joint Entropy and Enthalpy", 2021 IISE Annual Conference & Expo, May. 24, 2021, Virtual.

TEACHING EXPERIENCE

- **DS 7140 Python for Data Science** (Instructor, KSU graduate course, Spring 2025)
- **DATA 4140 Python for Data Science** (Instructor, KSU undergraduate course, Spring 2025)
- **IEE 505 Information Systems Engineering** (Teaching Assistant, ASU graduate course, Spring 2024)
- **IEE 305 Information Systems Engineering** (Teaching Assistant, ASU undergraduate course, Fall 2020)
- **IEE 475 Simulating Stochastic Systems** (Teaching Assistant, ASU undergraduate course, Fall 2018)
- **960:540 Statistical Quality Control I** (Teaching Assistant, Rutgers Graduate Course, Spring 2017)

SERVICES

Journal and Conference Reviewer: (33 in total**)**

Expert Systems with Applications (13), Engineering Applications of Artificial Intelligence (11), Journal of Medical Imaging (2), Science and Technology for the Built Environment (1), The 2024 ACM/SIGAPP Symposium on Applied Computing (3), IEEE Transactions on Automation Science and Engineering (1), IEEE Conference on Automation Science and Engineering (IEEE CASE) (2)

Conference Session Organizing:

- **Session Co-chair**, "Applications of machine learning and AI for physical and mental health", Data Mining (DM) Society. 2024 INFORMS Annual Meeting
- **Session Chair, "**Data-driven vs. Rule-based: The Capability of Data-Driven Solutions for Real-World Applications", Data Mining (DM) Society. 2023 INFORMS Annual Meeting

ASU Community Services:
- Graduate and Professional Student Association (GPSA) travel grant reviewer
- Graduate and Professional Student Association (GPSA) research grant reviewer

CERTIFICATES

- SAS Certified Advanced Programmer for SAS 9, SAS
- SAS Certified Base Programmer for SAS 9, SAS
- Six Sigma Green Belt, IISE

PROFESSIONAL AFFILIATIONS

- Institute for Operations Research and the Management Sciences (INFORMS)
- Institute of Industrial and Systems Engineers (IISE)
- The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)