Kuan Huang

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Assistant Professor, Department of Computer Science and Technology
The Dorothy and George Hennings College of Science, Mathematics and Technology, Kean University

Education

Utah State University (USU) — Logan, UT
Ph.D. in Computer Science. GPA: 3.98/4.00, Best Dissertation Award — *Aug. 2016 – May 2021*
Supervisor: Dr. Heng-Da Cheng
Dissertation: Breast Ultrasound Image Segmentation Based on Uncertainty Reduction and Context Information

Harbin Institute of Technology (HIT) — Harbin, China
B.Eng. in Measurement Control Technique & Instruments. GPA: 3.78/4.0 — *Sep. 2012 – Jun. 2016*
Thesis topic: Estimating Lithium-ion Batteries State of Health (SOH) Using Particle Filter

Professional Work Experience

Assistant Professor
Kean University — *Union, USA, Sep. 2022-Present*

Post-doctoral Researcher
Baylor College of Medicine — *Houston, USA, May 2021-Sep. 2022*

Teaching Assistant
Utah State University — *Logan, USA, Aug. 2016-May 2021*

Teaching

Assistant Professor — Kean University
CPS2231: Computer Programming (Java Programming) — *Fall 2022 - Spring 2024*
CPS4801: Artificial Intelligence — *Spring 2023, 2024, 2025*
CPS5801: Advanced Artificial Intelligence — *Spring 2023, 2024, 2025*
CPS4802: Machine Learning Algorithms — *Fall 2022, 2023, 2024*
CPS5802: Machine Learning Innovations — *Fall 2022, 2023, 20024*

Teaching Assistant — Utah State University
CS2810: Computer Systems Organization and Architecture — *Fall 2016, Spring 2020, Fall 2020, Spring 2021*
CS5050: Advanced Algorithms — *Fall 2017 – Fall 2019*
CS1410: Introduction to C++ — *Spring 2017*

Lab Instructor — Utah State University
CS1400: Introduction to Python — *Summer 2019*

Research Experience

Research Interests:

- Artificial Intelligence
- Computer Vision
- Machine Learning
- Deep Learning
- Pattern Recognition
- Medical Image Analysis

Grants:

- **2025 received:** OpenAI Researcher Access Program, $10,000 OpenAI API credits.
- **2025 received:** Oak Ridge Leadership Computing Facility (OLCF) computational resource, Co-PI, Frontier: 20,000 node hours and Andes: 2,500 node hours, "Large Language Models for Breast Cancer Detection."

- **2024 received:** NSF CISE MSI Award # 2430746, PI, $203,981 budget, "Collaborative Research: CISE MSI: RCBP: SCH: Advancing Breast Cancer Detection in Ultrasound Imaging through Active and Weakly Supervised Learning Techniques."
- **2024 received:** Students Partnering with Faculty (SpF) 2024 Awards, Kean University, Co-PI, $17,000 budget, "Trustworthy Weakly Supervised Breast Cancer Detection in Ultrasound Imaging."
- **2023 received:** IST Research Fellowship, Kean University, PI, $10,000 budget, "A Novel Trustworthy Weakly-Supervised Image Segmentation Framework."
- **2023 received:** CAHSI-Google Institutional Research Program, PI, $80,000 budget, with $20,000 Google Cloud Platform (GCP) credits,"Weakly Supervised Image Segmentation with Image Level Labels."
- **2023 received:** Students Partnering with Faculty (SpF) 2023 Awards, Kean University, PI, $16,000 budget, "Deep Learning-Based Breast Ultrasound Image Analysis."

Peer Reviewed Journal Articles

1. **K. Huang**, M. Xu, Y. Wang, Using Adversarial Training to Improve Uncertainty Quantification, accepted by IEEE Transactions on Artificial Intelligence, 2025.
2. B. Hu, J. You, **K. Huang**, M. Xu, D. Liu, S. Ma, EffTEE: Efficient Image Classification and Object Detection on Mobile Devices using Trusted Execution Environments, in IEEE Access (Impact Factor = 3.4, 2023), 2025.
3. T. Wang, **K. Huang**, M. Xu, J. Huang, Weakly Supervised Chest X-ray Abnormality Localization with Non-Linear Modulation and Foreground Control, in Scientific Reports (Impact Factor = 3.8, 2023), 2024.
4. Y. Kumar, **K. Huang**, A. Perez, G. Yang, J. J. Li, P. Morreale, D. Kruger and R. Jiang, Bias and Cyberbullying Detection and Data Generation Using Transformer Artificial Intelligence Models and Top Large Language Models, in Electronics (Impact Factor = 2.6, 2023), 2024.
5. Y. Kumar, **K. Huang**, C. C. Lin, A. Watson, J. J. Li, P. Morreale, J. Delgado, Applying Swin Architecture to diverse Sign Language Datasets, in Electronics (Impact Factor = 2.6, 2023), 2024.
6. M. Xu, J. Huang, **K. Huang (corresponding author)**, F. Liu, Incorporating Tumor Edge Information for Fine-Grained BI-RADS Classification of Breast Ultrasound Images, in IEEE Access (Impact Factor = 3.4, 2023), 2024.
7. M. Xu, **K. Huang (corresponding author)**, X. Qi, Regional-Attentive Multi-Task Learning Framework for Breast Ultrasound Image Classification and Segmentation, in IEEE Access (Impact Factor = 3.4, 2023), 2023.
8. **K. Huang**, Y. Zhang, H. D. Cheng, P. Xing, Trustworthy Breast Ultrasound Image Semantic Segmentation Based on Fuzzy Uncertainty Reduction, in Healthcare (Impact Factor = 2.8, 2022), 2022.
9. Y. Zhang, M. Xian, H. D. Cheng, B. Shareef, J. Ding, F. Xu, **K. Huang**, B. Zhang, C. Ning, Y. Wang, BUSIS: A Benchmark for Breast Ultrasound Image Segmentation, in Healthcare (Impact Factor = 2.8, 2022), 2022.
10. **K. Huang**, Y. Zhang, H. D. Cheng, P. Xing, B. Zhang, Semantic Segmentation of Breast Ultrasound Image with Fuzzy Deep Learning Network and Breast Anatomy Constraints, in Neurocomputing (Impact Factor = 5.719, 2021), 2021.
11. Q. Yu, **K. Huang**, Y. Zhu, X. Chen, W. Meng, Preliminary results of computer-aided diagnosis for magnetic resonance imaging of solid breast lesions, in Breast Cancer Research and Treatment (Impact Factor = 4.872, 2019), 2019.

Peer Reviewed Conference Papers

1. J. Li, Y. Mi, M. Chen, **K. Huang**, G. Gupta, G. Tong, FD-GAN: A Dual-Domain Approach with Fourier Domain Discriminators for Denoising Low-Dose CT Images, accepted by the International Joint Conference on Neural Networks (IJCNN 2025).
2. M. Xu, Y. Wang, **K. Huang (corresponding author)**, AnatoSegNet: Anatomy Based CNN-Transformer Network for Enhanced Breast Ultrasound Image Segmentation, accepted by the 22nd IEEE International Symposium on Biomedical Imaging (ISBI 2025).

3. **K. Huang (corresponding author)**, Y. Wang, M. Xu, Investigating the Fairness of Deep Learning Models in Breast Cancer Diagnosis Based on Race and Ethnicity, in the AAAI 2024 Fall Symposium on Machine Intelligence for Equitable Global Health (MI4EGH 2024).
4. T. H. Lin, D. Kwak, and **K. Huang (corresponding author)**, Weakly Supervised Breast Ultrasound Image Segmentation Based on Image Selection, accepted by the 46rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2024).
5. Y. Kumar, **K. Huang**, Z. Gordon, L. Castro, E. Okumu, P. Morreale and J. J. Li, Transformers and LLMs as the New Benchmark in Early Cancer Detection, in the 2023 5th International Conference on Advanced Information Science and System (AISS 2023).
6. J. Huang, **K. Huang (corresponding author)**, M. Xu and F. Liu, CFAB: An Online Data Augmentation to Alleviate the Spuriousness of Classification on Medical Ultrasound Images, in the 14th International Conference on Computer Vision Systems (ICVS 2023).
7. **K. Huang**, J. Huang, W. Wang, M. Xu, F. Liu, A Deep Active Learning Framework with Information Guided Label Generation for Medical Image Segmentation, in IEEE International Conference on Bioinformatics and Biomedicine 2022 (BIBM 2022).
8. **K. Huang**, Y. Cheng, Q. Gao, B. Zhang, Weakly Unpaired Image Translation from Hematoxylin and Eosin Staining Image to Immunohistochemistry Staining Image, in IEEE International Conference on Bioinformatics and Biomedicine 2022 (BIBM 2022).
9. M. Xu, **K. Huang**, X. Qi, Multi-Task Learning with Contextual Oriented Self-Attention for Breast Ultrasound Image Classification and Segmentation, in IEEE International Symposium on Biomedical Imaging 2022 (ISBI 2022).
10. **K. Huang**, M. Xu, X. Qi, NGMMs: Neutrosophic Gaussian Mixture Models for Breast Ultrasound Image Classification, in the 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2021).
11. Y. Xiao, **K. Huang**, S. Niu, J. Huang, Interpretable Fine-grained BI-RADS Classification of Breast Tumors, in the 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2021).
12. **K. Huang**, Y. Zhang, H. D. Cheng, P. Xing, MSF-GAN: Multi-Scale Fuzzy Generative Adversarial Network for Breast Ultrasound Image Segmentation, in the 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2021).
13. **K. Huang**, Y. Zhang, H. D. Cheng, P. Xing, Shape-Adaptive Convolutional Operator for Breast Ultrasound Image Segmentation, in IEEE International Conference on Multimedia and Expo 2021 (ICME 2021).
14. M. Xu, **K. Huang**, Q. Chen, X. Qi, MSSA-Net: Multi-scale Self-attention Network for Breast Ultrasound Image Segmentation, in IEEE International Symposium on Biomedical Imaging 2021 (ISBI 2021).
15. **K. Huang**, Y. Zhang, H. D. Cheng, P. Xing, B. Zhang, Semantic Segmentation of Breast Ultrasound Image with Pyramid Fuzzy Uncertainty Reduction and Direction Connectedness Feature, in 2020 25th International Conference on Pattern Recognition (ICPR 2020).
16. **K. Huang**, H. D. Cheng, Y. Zhang, B. Zhang, P. Xing, C. Ning, Medical Knowledge Constrained Semantic Breast Ultrasound Image Segmentation, in 2018 24th International Conference on Pattern Recognition (ICPR 2018).
17. F. Xu, M. Xian, Y. Zhang, **K. Huang**, H. D. Cheng, B. Zhang, J. Ding, C. Ning, Y. Wang, A Hybrid Framework for Tumor Saliency Estimation, in 2018 24th International Conference on Pattern Recognition (ICPR 2018).

Mentoring Students in Conference Papers

1. C. Marte, M. Xu, **K. Huang**, Text-Guided Weakly Supervised Segmentation for COVID-19 Detection in X-Ray Images, accepted by 2024 International Conference on Computational Science and Computational Intelligence (CSCI 2024).

2. M. Ahmed, J. Loja, **K. Huang**, M. Xu, Benchmarking the Robustness of Segmentation Methods Against Adversarial Attacks in Breast Ultrasound Segmentation, accepted by 2024 International Conference on Computational Science and Computational Intelligence (CSCI 2024).
3. A. Mendez, M. Xu, **K. Huang**, Multimodal Breast Ultrasound Segmentation: Combining Visual and Clinical Data, accepted by 2024 International Conference on Computational Science and Computational Intelligence (CSCI 2024).
4. J. Rodriguez, **K. Huang**, and M. Xu: Multi-Task Breast Ultrasound Image Classification and Segmentation Using Swin Transformer and VMamba Models, accepted by the International Conference on Pattern Recognition and Artificial Intelligence (PRAI 2024).
5. T. Dacayan, E. Ponte, **K. Huang**, D. Kwak, Utilizing a Spatial Grid for Automated Parking Space Vacancy Detection, in 2023 International Conference on Computational Science and Computational Intelligence (CSCI 2023).
6. J. Loja, A. Mendez, **K. Huang**, Multi-Task Breast Ultrasound Image Segmentation and Classification Using Convolutional Neural Network and Transformer, in the 2023 IEEE MIT Undergraduate Research Technology Conference (URTC 2023).
7. A. Balcacer, B. Hannon, Y. Kumar, **K. Huang**, J. Sarnoski, S. Liu, J. J. Li, P. Morreale, Mechanics of a Drone-Based System for Algal Bloom Detection Utilizing Deep Learning and LLMs, in the 2023 IEEE MIT Undergraduate Research Technology Conference (URTC 2023).
8. E. Ponte, X. Amparo, **K. Huang**, and D. Kwak, Automatic Pill Identification System based on Deep Learning and Image Preprocessing, in the 2023 World Congress in Computer Science, Computer Engineering, & Applied Computing (CSCE 2023).

Programming Skills:

- Programming language: proficient in Python, MATLAB, C/C++, Java
- Deep learning tools: proficient in TensorFlow, PyTorch, Keras, Prompt Engineering (LLaMA 3, GPTs)
- Version Control: Git, Hugging Face

Services

- NSF Panelist.
- Paper Review:
    1. Computational and Structural Biotechnology Journal
    2. Journal of Computer Science and Technology
    3. IEEE Winter Conference on Applications of Computer Vision
    4. IEEE International Conference on Pattern Recognition
    5. Sensors
    6. Electronics
    7. Algorithms
    8. Applied Science
    9. Intelligent Data Analysis
    10. Heliyon
    11. Current Medical Imaging
    12. Scientific Reports
    13. IEEE International Symposium on Biomedical Imaging 2024
    14. IEEE Conference on Multimedia Expo 2024
    15. Clinical Proteomics
    16. International Conference on Medical Image Computing and Computer Assisted Intervention 2024

17. Computers in Biology and Medicine

- Professional Societies:
  1. IEEE member, 2020 - present
  2. IEEE Engineering in Medicine and Biology Society Member, 2020 - present
  3. AAAI member, 2024 - present
- Open House, Kean University:
  1. Undergraduate Open House, 2022 - present
  2. Graduate Open House 2022 - present
  3. Major/Minor Fair, 2024
- Committee, Kean University:
  1. Departmental DEI committee chair, 2023 - present
  2. Departmental curriculum committee member, 2023 - 2024
  3. Departmental research committee member, 2024 - present
  4. Wenzhou-Kean University faculty search committee, 2023
  5. End-of-Year Faculty Research Conference Holding committee member, 2023 - present
- Student Research Mentor, Kean University:
  1. Independent Study, 2023 - present
  2. Local REU Program, 2023 and 2024
- Undergraduate academic advisor, Kean University, 2022 - present
- Department GPU server management, Kean University, 2022 - present
- Merit scholars brunch, Kean University, 2023
- Lockheed Martin's department visiting, Kean University, 2023
- HackKean event, Kean University, 2023
- Departmental BPC plan, Kean University, 2023
- Departmental ACM club advisor, Kean University, 2023 - present
- Contributor to the development of the Ph.D. in Computer Science program, Spring 2024.
- Contributor to the development of the B.S. in Artificial Intelligence program, Spring 2024.
- Referee for Student Job and Academic Applications, 2023 - present
- Graduate and undergraduate Commencement, 2023 and 2024
- Ph.D. student interviewer of tenure-track candidates, Utah State University, 2020

Honors and Awards

Best Dissertation Award	USU, 2022
Travel grant of the 24th International Conference on Pattern Recognition	Beijing, 2018
Outstanding Individual Student Scholarship, School of Electrical Engineering	HIT, 2014
Excellent Students of Harbin Institute of Technology	HIT, 2014
Excellent Students of Harbin Institute of Technology	HIT, 2013
Third prize of Chinese Mathematics Competitions	Heilongjiang Province, 2013
Excellent Volunteer in Freescale Cup National College Students Intelligent	HIT, 2013
Second prize in Project Design for the freshman, School of Electrical Engineering	HIT 2013
Outstanding Individual Student Scholarship, School of Electrical Engineering	HIT 2013
Third prize in Adolescents Science and Technology Innovation Contest	China 2013

Professional Training

- Kean University's SESMag Faculty Development Workshop in 2024
- Attended Broadening Participation in Computing (BPC) workshop in 2023
- GenderMag Evaluator Training in 2023
- Attended CURF Workshop: Student-Faculty Research Opportunities at Kean University in 2022
- Attended the New Faculty Orientation at Kean University in 2022
- Attended the workshop: Pathways to Independence: Preparing K99/R00, Understanding NIH in 2022
- Attended the Empowering Teaching Excellence program and received professional training with the Canvas platform and course design at Utah State University in 2022
- Attended the Equity in Graduate Education panel at Utah State University in 2021
- Attended the Graduate Student Proposal Writing Seminars at Utah State University in 2021