Zhixun "Jason" He

Career Objective: **Instructor, Teaching Faculty, Tenure Track Faculty**

h.zhixun@gmail.com ❙ Website: https://inspirepassion.github.io// ❙ Merced, CA, 95340

EDUCATION

Ph.D. (**2024**) Electronic Engineering & Computer Science (GPA: 3.8/4.0)	**University of California, Merced**	**Merced, CA**
B.S. (**2013**) Composite Material Science & Engineering (GPA: 3.8/4.0)	**Nanjing Tech University**	**Nanjing, China**

RESEARCH INTEREST

• Computer Vision, Natural Language Processing, LLM, Model Interpretability and Generalization, Reinforcement Learning and Decision-Making

TEACHING INTEREST

• Probability and Statistics for Machine Learning, Computer Vision, Natural Language Processing, Algorithms and Data Structures, Theory of Computation, Optimization for Machine Learning, Cybersecurity and Secure AI, Database Systems and Big Data Analytics, Artificial Intelligence

SKILLS

• Python (8 years) · Swift (1 year) · C/C++ (3 years) · Java · Git · Docker · K8s · SQL · Algorithm Design · Data Structure
• Tensorflow(7 years) · Keras · PyTorch · Computer Vision(CV) · Natural Language Processing(NLP) · Reinforcement Learning (RL) · Transfer Learning · Model Fine-tuning · Distillation · Object Detection · Quantitative Analysis · Prototyping · Modeling

TEACHING EXPERIENCE

Instructor of Record | *Artificial Intelligence, Machine Learning, and Data Science*   *June 2019 - Sep. 2019*

Digital Media Academy   *Stanford, CA*

• Course Info: summer class, **6 hrs/week** lecture, **12 hrs/week** lab/discussion, **23 students** (each session), and **1 TA**.

• Collaborated with TA to design course syllabus, homework, and quizzes. Led in-person lecturing, lab/discussions, and hands-on programming exercises that include **15** advanced machine learning projects using Python.

• Computer Vision: Guided students in YOLO/OpenCV-based real-time object detection; **85%** met key benchmarks.

• NLP: Led sentiment analysis and text summarization projects; **90%** of students successfully applied TextRank, LDA, and Seq2Seq.

• Reinforcement Learning: Mentored Deep Q-Network projects; **88%** of students mastered reward optimization and policy gradients.

• Multi-modal AI: Supported GAN/VAE-based text-to-audio/image models; **92%** of participants demonstrated strong integration skills.

Teaching Assistant | *School of Engineering, School of Humanity and Science*   **August 2016 - Dec. 2023**

University of California, Merced   *Merced, CA*

• Courses Info: in-person mainly, online (2020-2021), **4-unit** class, student size (**20-30**), **1** lab/week, **2** discussions/week.

• Courses:
  CSE   005: Introduction to Computer Applications
  ECON 010: Statistical Inference
  ECON 100: Intermediate Microeconomic Theory
  ECON 110: Econometrics
  CSE   015: Discrete Math
  CSE   022: Introduction to Programming ·
  CSE   024: Advanced Programming ·
  CSE   031: Computer Organization and Assembly Language.

• Led interactive discussions and workshops that fostered critical thinking and hands-on engagement, providing personalized guidance and debugging support in C++, Python, and Java, contributing to a **10%** retention boost, **13%** satisfaction increase, and **6.2/7.0** evaluation score.

• Co-developed syllabus, course materials with well-designed figures and color coding, interactive quizzes, and hands-on lab exercises.

• Applied flipped classroom and problem-based learning to foster critical thinking in algorithm design, data structures, and software engineering.

• Emphasized project-based learning to deepen student understanding of algorithm design, data structures, and software engineering best

Instructor | *Tensorflow for Social Good*   ***Sep. 2022 - Nov. 2022***

CITRIS and Google Research at UC Merced   *Merced, CA*

- Course Info: workshop, in-person, **1.5** hrs/w lecture, **1** discussion/week, **77** students, collaborated with CITRIS director.

- Co-developed curriculum with **2** colleagues, including syllabus, workshop material, and outcome evaluation toolkit.

- Developed an adaptive curriculum tailored for both beginners and intermediates. Utilized Google Colab and live coding demonstrations, leading to a **100%** in hands-on engagement and project initiation.

- Applied formative assessment techniques (e.g., real-time Q&A and live feedback) to gauge student progress, with **85%** of participants reporting increase in confidence when applying TensorFlow to projects.

- Designed a blended learning timeline (networking, micro-lectures, hands-on coding) that maintained **91%** retention. Balanced competitive and non-competitive paths, with **40%** joining teams and **60%** focusing on skill growth.

MENTORING EXPERIENCE

First-year Graduate Student Mentor   ***Mar. 2019 - Aug. 2019***

Graduate Division, UC Merced   *Merced, CA*

- Guided first-year graduate students through academic and research challenges, addressing unique challenges faced by international and underrepresented students. Facilitated bi-weekly mentoring sessions covering topics such as research methodologies, time management, and professional development, improving mentees' confidence and productivity.

- Laxmi Pandey: Graduated Ph.D. from UCMerced, currently working as research scientist at Meta AI.

- Jothi Prasanna Sundaram: Currently a Ph.D. candidate at UCMerced, previously an intern at Mitsubishi Electric Research Laboratories.

- Nasit Sony: Currently a Ph.D. candidate at UCMerced. Since their Ph.D. journey, 5 first-author papers have been published.

OUTREACHING EXPERIENCE

Graduate Student Panelist   ***Mar. 2020***

3rd Annual CS4Me Day, UC Merced   *Merced, CA*

- Provided research talk and tour of the lab for undergraduates from Merced College, CSU Stanislaus, CSU Fresno, and UCM.

Graduate International Student Panelist and Coordinator   ***Jul. 2016 - Aug. 2016***

Graduate Orientation Week , UC Merced   *Merced, CA*

- Coordinated international graduate students to provide talks for new students and organized a Q/A session for new students.

AWARDS AND HONORS

- Grad Excel Peer Mentor Award, **UC Merced** (**2019**).

- EECS Bobcat Summer Fellowship, **UC Merced** (**2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023**).

- Student Fee Advisory Committee Fellowship, **UC Merced** (**2018, 2019, 2020, 2021, 2022**).

- Graduate Orientation Week International Student Support Fellowship, **UC Merced** (**2016**).

- Academic Merit Scholarship, **Nanjing Tech University** (**2010, 2011, 2012, 2013**).

RESEARCH EXPERIENCE

Graduate Student Researcher | *School of Engineering*   ***Aug. 2019 - Jan. 2024***

Adversarial Defense Framework for Deep Learning Models   *Merced, CA*

- Conducted end-to-end research on defending computer vision deep learning models against adversarial attacks, developing over 50 novel machine learning models using TensorFlow and Python. Three of them produced state-of-the-art results.

- Published **4** peer-reviewed papers in international conferences (ICMVA 2024, PRML 2022, MVA 2021, and IROS 2019) and presented research findings, enhancing the department's visibility and promoting external academic collaborations.

- Mentored **3** first-year graduate students on research methodologies, academic progress, and mental health support, resulting in improved research productivity and higher retention rates.

Research Collaborator | School of Engineering   *Aug. 2018 - Nov. 2019*

Active Learning of Reward Dynamics from Hierarchical Queries   *Merced, CA*

- Implemented and fine-tuned a conditional probability model based on Bayesian inference to analyze driver behavior and infer hidden reward functions from driving preferences and trajectory data.

- Optimized and debugged a Python-based car interaction simulator, reducing runtime errors by **30%** and improving simulation speed by **20%**, facilitating smoother experimentation and analysis workflows.

Research Collaborator | School of Engineering   *Jan. 2016 - July 2016*

Sentiment Analysis in Influential Internet Articles on Climate and Biotech   *Merced, CA*

- Benchmarked various sentiment and topic modeling algorithms, such as Latent Dirichlet Allocation (LDA), TextRank, Latent Semantic Analysis (LSA), Correlation Explanation (CorEx), and Non-Negative Matrix Factorization (NMF).

- Developed a pipeline for preprocessing, analyzing, and visualizing sentiments across 1,000+ influential articles in Python.

- Collaborated with interdisciplinary teams to interpret sentiment analysis outcomes, bridging the gap between engineering and environmental science insights.

PUBLICATIONS (page number of the papers)

- **Z. He**, M. Singhal, "**VQUNet: Vector Quantization U-Net for Defending Adversarial Attacks by Regularizing Unwanted Noise**", 7th *International Conference on Machine Vision and Applications (**ICMVA**), Mar. 2024*.

- **Z. He**, M. Singhal, "**Defense-CycleGAN: A Defense Mechanism Against Adversarial Attacks Using CycleGAN to Reconstruct Clean Images**", *International Conference on Pattern Recognition and Machine Learning (**PRML**), Jul. 2022*.

- **Z. He**, M. Singhal, "**Adversarial Defense Through High-Frequency Loss Variational Autoencoder Decoder and Bayesian Update With Collective Voting**", *17th International Conference on Machine Vision Applications (**MVA**)*, Jun. 2021.

- C. Basu, E. Biyik, **Z. He**, M. Singhal, and D. Sadigh, "**Active Learning of Reward Dynamics from Hierarchical Queries**", *Proceedings of the International Conference on Intelligent Robots and Systems (**IROS**)*, Nov. 2019.

PRESENTATIONS

- Thesis defense: "Defense Frameworks Against Adversarial Attacks on Deep Learning Models", *University of California, Merced*, **April 2024**.

- Conference: "VQUNet: Vector Quantization U-Net for Defending Adversarial Attacks by Regularizing Unwanted Noise", 7th *International Conference on Machine Vision and Applications (ICMVA)*, **March 2024**.

- Symposium: "Adversarial Defense for Deep Learning Models", *1st EECS Symposium, UC Merced*, **April 2023**.

- Seminar: Defense Frameworks Against Adversarial Attacks For Deep Learning Models, *EECS Seminar, UC Merced*, **Mar. 2023**.

- Contributed talk: "TensorFlow Overview, Applications, and End-to-end Workflow", *CITRIS TensorFlow for Social Good*, **September 2022.**

- Conference: "Defense-CycleGAN: A Defense Mechanism Against Adversarial Attacks Using CycleGAN to Reconstruct Clean Images", *3rd International Conference on Pattern Recognition and Machine Learning (PRML)*, **July 2022**.

- Conference: "Adversarial Defense Through High-Frequency Loss Variational Autoencoder Decoder and Bayesian Update With Collective Voting", *17th International Conference on Machine Vision Applications (MVA)*, **June 2021**.

- Contributed talk: "The Robustness of Machine Learning Algorithms under Adversarial Attacks", *Computer Science 4 Me (CS4Me), UC Merced*, **March 2020**.

LEADERSHIP & SERVICE EXPERIENCE

Chair   *Aug. 2021 - May 2023*

Student Fee Advisory Committee (SFAC), UC Merced   *Merced, CA*

- Facilitated meetings, set agendas, outreach, staff recruitment, cross-team collaboration, and advocating for student interests.

- Reviewed and evaluated student fee policy, budget, and programs and reported to the Vice Chancellor and business office.

Secretary   *Aug. 2020 - May 2021*

Student Fee Advisory Committee (SFAC), UC Merced   *Merced, CA*

- Meeting coordination, minute-tracking, document management, agenda preparation, archiving, and committee support.

Grad Student Representation   *Aug. 2017 - May 2020*

Student Fee Advisory Committee (SFAC), UC Merced   *Merced, CA*

• Student feedback collection, advocating student body's interests, liaison between students and university departments.

Delegate Assembly, EECS *Aug. 2017 - Aug. 2018*

Graduate Student Association (GSA), UC Merced *Merced, CA*

• Advocacy for students, event organizing, collaboration with university administration, communication, and policy review.

International Affairs Officer *Aug. 2016 - Aug. 2017*

Graduate Student Association (GSA), UC Merced *Merced, CA*

• Advocacy for international students, policy review, community building/networking, support service, and cultural awareness.

Grad Student Representation, Coordinating Committee on Graduate Affairs *Jan. 2016 - Aug. 2017*

UC Office of the President *Oakland, CA*

• Participated in decision-making meetings happening in UC system, provided inputs to administration, and reviewed policies.

Chief of Staff *Jan. 2016 - Aug. 2016*

GSA External Vice President Advisory Board *Merced, CA*

• Organizational coordination, strategic support, communication, team management, report drafting, and offered advice.

INDEPENDENT DEVELOPMENT

Tennis Match Management, Analyzer, Metrics Tracker(WatchOS & IOS) *June 2024 - present*

• Designed thoughtful UX/UI using WatchKit and SwiftUI, aligning with industry standards for wearable device interfaces, achieving significant ease of use, reducing finger gesture error by **34%** through optimized UI, minimizing user memory recall mistake by **65%** via intuitive workflows, enhancing finger gesture error tolerance by **46%** with predictive input fields, and accelerating data input time by **23%** with intuitive shape and color coding.

• Developed scalable architecture and reusable APIs using Swift, such file manager, data visualization utilities, device communication, and data models. Maintained well-documented codebase for future scalability and collaboration.

• Utilized MySQL for efficient storage and retrieval of match metrics in Python. Investigated and integrated emerging technologies to balance scalability, complexity, and maintainability, such as managing backend development pipelines with GitLab CI/CD. Experimenting and architecting microservices for high concurrency, reliability, and scalability for large user bases, leveraging containerization with Docker and orchestration with Kubernetes.

REFERENCES

 Upon request