Zekun Wu

Email Website LinkedIn

Education

Saarland University — Saarbrücken, Saarland, Germany
Ph.D. in Computer Science — *Feb. 2023 – Present*

Washington University in St. Louis — St. Louis, MO, USA
Master of Science in Data Analytics and Statistics — *Sep. 2019 – May 2021*

Beihang University — Beijing, China
Master of Science in Control Science and Engineering — *Sep. 2016 – Jan. 2019*

Nanjing University of Aeronautics and Astronautics — Nanjing, Jiangsu, China
Bachelor of Engineering in Mechanical Engineering and Automation — *Sep. 2008 – July 2012*

Publications

1. **Z. Wu**, M. Jobanputra, V. Demberg, J. Hullman and A. Feit (2025). Beyond Persuasion: How AI Response Features Shape User Belief Strength and Stance. *arXiv preprint arXiv:2511.09667.* [details]
2. **Z. Wu** and A. Feit (2025).Understanding and Predicting Temporal Visual Attention Influenced by Dynamic Highlights in Monitoring Task. *IEEE Transactions on Human-Machine Systems (IHMS)*[details].
3. **Z. Wu**, Y. Wang, M. Langer and A. Feit (2025).RelEYEance: Gaze-based assessment of users' AI-reliance at run-time. *ACM Symposium on Eye Tracking Research and Application (ETRA 2025).*[details]
4. **Z. Wu** and A. Feit (2024). Enhancing Saliency Prediction in Monitoring Tasks: The Role of Visual Highlights. *ACM Symposium on Eye Tracking Research and Application (ETRA 2024).* [details]
5. A.Das*, **Z.Wu***, I. Škrjanec, and A. Feit (2023). Shifting Focus with HCEye: Exploring the Dynamics of Visual Highlighting and Cognitive Load on User Attention and Saliency Prediction. *ACM Symposium on Eye Tracking Research and Application (ETRA 2024).* [details]
6. **Z. Wu**, S. Doroudian, A. Lu (2023). What User Behaviors Make the Differences During the Process of Visual Analytics? *arXiv preprint arXiv:2311.00690.* [details]
7. S. Doroudian, **Z. Wu**, A. Galati, W. Wang, and A. Lu (2021). A Study of Real-time Information and Immersive Maps on User Behaviors during Search and Rescue (SAR) Training of Firefighters. *IEEE VR 2022 Workshop on 3D Content Creation for Simulation Training (TrainingXR).* [details]
8. K. Wu and **Z. Wu** (2020). A Human-Centered Risk Model for Construction Safety. *IEEE Access.* [details]
9. **Z. Wu**, P. Xin, X. Zhao, and Y. Jiang (2019). The Task Demands-Resources Method: A New Approach to Human Reliability Analysis from a Psychological Perspective. *Quality and Reliability Engineering International.* [details]
10. X. Pan and **Z. Wu** (2018). Performance Shaping Factors in Human Error Probability Modification of Human Reliability Analysis. *International Journal of Occupational Safety and Ergonomics.* [details]
11. **Z. Wu**, X. Pan, and X. Chen (2017). Relation of Motivation Intensity, Stress Level, and Human Performance: A Human Reliability Experiment. *Proceedings of the 11th Asian Control Conference (ASCC 2017)*, Gold Coast, 2017. [details]
12. **Z. Wu**, X. Pan, H. Wang, and J. Chen (2017). Influence of Work Motivation and Task Difficulty on Human Reliability. *Proceedings of the 2nd International Conference on Reliability Systems Engineering (ICRSE 2017)*, Beijing, 2017. [details]

Projects

Gaze-Based Proactive AI Reading Assistant for Children June 2025 – Present

- Designed a gaze-driven framework that detects children's attentional states (curiosity, mind-wandering) during reading activities using eye-tracking data.
- Developed proactive assistance strategies powered by large language models (LLMs) to adapt support across different reading scenarios, both when children read alone and in child–parent joint reading.

Examining AI Prompt Design for Influencing User Beliefs Jan 2025 – Present

- Designed and ran a large-scale online experiment to evaluate how AI response detail and confidence affect user belief changes in factual and opinion tasks.
- Developed a belief measurement framework and statistical models that uncovered how specific AI message features can systematically shift user beliefs.

Temporal Saliency Analysis with Visual Highlighting Feb 2023 – Present

- Developed a multiple drone monitoring interface prototype, examining the effects of visual highlighting on user gaze behavior.
- Collected a gaze dataset to document variations in user gaze patterns influenced by visual highlights, facilitating detailed user behavior analysis and interface optimization.
- Employed deep-learning-based saliency models to predict user fixation patterns, aiding in the comprehension of user-interactive interface effectiveness.

Future of Firefighting and Career Training Sep 2021 – Feb 2023

- Handled data collection and analysis in an immersive virtual reality simulation system, focusing on firefighting search and rescue scenarios.
- Developed a model to estimate user stress levels using a stacked-LSTM layer neural network.

Human-Machine System Simulation based on Probabilistic Safety Analysis Jul 2017 – Jan 2019

- Conducted field research at the Wenchang Spacecraft Launch Site, defining research objectives and formulating a research plan centered on monitoring the fueling process during spacecraft launches.
- Conducted a literature review to understand the applications of probabilistic graphical models and human reliability models in spacecraft launch monitoring.
- Completed a graduate thesis on monitoring tasks during spacecraft fueling processes using Bayesian Network approaches.

Human Reliability Analyses based on Cognitive Motivation Model Sep 2016 – Jan 2019

- Conducted a simulation to understand the effects of motivation intensity on human performance using artificial neural networks.
- Led a team to design and implement a simulated experiment on the aircraft approaching process.
- Performed statistical analyses to assess different factors influencing human performance, using methods such as ANOVA, regression analysis, and data smoothing with curve fitting.

Experience

Researcher, E6 Project (CPEC Group) Feb. 2023 – Present

Saarland University *Saarbrücken, Saarland, Germany*

- Led research on eye-tracking in human–AI interaction, spanning visual attention prediction, real-time inference of user reliance on AI, and gaze-driven proactive assistance from LLM, combining experimental design with advanced computational modeling.
- Engaged in international research collaborations, enriching the project's depth and scope; actively contributed to collaborative meetings and knowledge exchange sessions.
- Organized seminars, facilitated student discussions on emerging models, and supervised master students.

Graduate Research Assistant Sep. 2021 – Feb. 2023

UNC Charlotte *Charlotte, NC, USA*

- Designed and implemented a firefighter search and rescue experiment utilizing a VR system, focusing on realistic simulation and data accumulation.

- Managed the collection, processing, and modeling of data generated from the VR experiment, paving the way for more immersive training experiences.

Assistant in Instruction Jan. 2020 – May. 2021
Washington University in St. Louis *St. Louis, MO, USA*

- Conducted 8 comprehensive seminar lectures on R programming, facilitating learning for 50+ undergraduate students.
- Offered office hours to review material, address questions, and assist students with assignments, enhancing their understanding and performance.
- Tasked with the development and grading of assignments, quizzes, and exams, ensuring accurate evaluation of student understanding and progress.

Graduate Research Assistant Sep. 2016 – Mar. 2019
Beihang University *Beijing, China*

- Completed Master's research focuses on human reliability analysis during the fueling process of spacecraft launch activities.
- Designed a substantial simulation program for rocket propellant fueling operations
- Led the development and publications, contributing valuable insights to the field.

Junior Maintenance Engineer Jul. 2012 – Jun. 2015
SF Airlines *Shenzhen, Guangdong, China*

- Crafted compliance bulletins for frontline engineers, interpreting manufacturers' maintenance manuals with accurate translations and documentation.
- Offered technical support to maintenance technicians, aiding in diagnosing, troubleshooting, and documenting issues associated with aircraft engines.

Skills and Competencies

Programming Languages: Python (pytorch, scikit-learn, numpy, pandas), Java, SQL, JavaScript, HTML/CSS, R
Large Language Model Tools: OpenAI API, LangChain, Hugging Face Transformers
Software: SPSS, SAS
Developer Tools: Git, VS Code, Visual Studio, PyCharm, Eclipse
Mathematics: Estimation and Detection Theory, Matrix Theory, Numerical Analysis, Optimization, Probability and Stochastic Process