Yinsu Zhang

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SUMMARY

Graduating human factors Ph.D. (Dec 2025) with mechanical engineering background and 4+ year experience in human centered mixed-methods research (250+ participants) involving quantitative (neural, physiological, behavioral), and qualitative (survey, interview) analysis. **Eager to develop safe customer-oriented products by truly understanding human cognition.**

EDUCATION

University of Wisconsin, Madison, WI | **Ph.D., Industrial and Systems Engineering - Human Factors** GPA: 3.82/4.0 | Dec 2025

Texas A&M University, College Station, TX | **Master, Mechanical Engineering - Control & Robotics** GPA: 3.64/4.0 | May 2020

Rensselaer Polytechnic Institute, Troy, NY | **B.S. Mechanical Engineering** | Dean's List GPA: 3.28/4.0 | May 2018

SKILLS

- **Human Factors Research:** experimental protocol design, data collection, survey, interview, quantitative and qualitative data analysis, wearable physiological sensors (fNIRS, EEG, ECG, EMG, GSR, eye tracking), biomechanics and ergonomics design
- **Mechanical Background:** Mechanical Design and Simulation (CAD), Prototyping (Machining), Control Systems Design
- **Software:** SPSS; JASP; 3DSSPP (Biomechanics); MATLAB (+Simulink); Robot Operating System (ROS); Siemens NX; SolidWorks; Microsoft Power BI; Final Cut Pro; Photoshop; InDesign; Illustrator; Premiere Pro
- **Programming Languages:** Python, R (modeling, statistical analysis); C (embedded control); MATLAB (control system design)

WORK EXPERIENCE

ZOOX | Product, Experience Research Intern - Human-AI Interactions, Safety — Jan – Jul 2024

- Proposed future-proof human performance model via eye-tracking metrics for proper operator arousal, workload, and fatigue
- Led focus group interviews with 120 safety drivers, presented operational and interface design guidelines to prevent human errors
- Conducted cross-functional safety research on multiple internal track testing protocol requests to ensure properly managed risks
- Designed, conducted human subject studies on multi-modal vehicle exterior communication and provided design recommendations

Volvo Construction Equipment | Soft Product Internship — Jun – Aug 2018

- Developed, and piloted PowerBI reports to help key accounts save 30% fuel, and boost 40% service revenue with telematic data
- Conducted unstructured interviews with 10 key accounts to improve metrics and visualizations for usability testing during pilot

RESEARCH EXPERIENCE

Dynamic Trust Modeling in SAE L3 Autonomous Driving (NSF) — Jun. 2021 – Present

- Designed naturalistic driving simulation to manipulate driver trust and elicit voluntary takeovers without explicit takeover requests
- Utilized neuroimaging to capture human cognitive states via cortical activation, functional connectivity analysis
- Modeled driver trust with multimodal physiological (ECG, fNIRS), behavioral (eye-tracking, driver inputs), performance measures
- Mentored 6 undergrads in data collection, analysis, interpretation of heart-rate and gaze data, and presentation in major conferences

Predict Cyberattack in Shared-Space Human-Robot Collaboration (NSF) — Jun. 2021 – Present

- Conducted human-in-the-loop research to detect cyberattack using operator behavioral, physiological, and cognitive response
- Developed eye-tracking analysis protocol using OpenCV image recognition to capture highly dynamic visual stimuli
- Explored eye-tracking gaze behavioral metrics as objective measures for capturing trust dynamics in human robot interactions

Graduate Teaching Assistant – Introductory Human Factors Courses — Aug – Dec 2022 & Aug – Dec. 2024

- Instructed 120-student labs on physiological data collection and analysis of physical & mental workload, usability testing, fatigue
- Mentored 25 student teams to develop and conduct human subject studies addressing emerging human factors burdens and needs

9 DOF Inertial Measurement Unit (IMU) Sensor Fusion — Jan – May 2020

- Calibrated *iPhone* low-cost 6-DOF accelerometer-gyroscope and 3-DOF magnetometer
- Used high-low-pass filter, double stage Kalman filter, Mahony filter for fusion and achieved comparable accurate results

MOONRAKER – Moon Colonization Autonomous Architecture — Aug – Dec 2019

- Led team of 5, designed autonomous distributed architecture with shared cognition to build space habitats with swarm robots

Corning Autonomous ONE Wireless RAU Commissioning System (Capstone) — Jan – May 2018

- Developed autonomous robot with Raspberry Pi, Microsoft Kinect, LIDAR in ROS for path planning & LTE, Wi-Fi testing

Ecovative Mushroom® Packaging Production Line Optimization — Sept 2017 – May 2018

- Conducted formative human factors study with project managers and workers for product requirements and insights
- Designed and prototyped roller system in SolidWorks, and reduced number of operators by 50%