Wei(Will) SHENG

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EDUCATION

Ph.D. in Computer Science 08/2023 - 05/2028
Purdue University - West Lafayette Advisor: **Xavier Tricoche, Rohan Paleja**

B.S. Double Major in Computer Science & Mathematics 08/2019 - 06/2023
University of Washington - Seattle GPA: 3.84/4.0

WORK EXPERIENCE

Software Engineer Intern | **Fesco & Adecco,** Shanghai, China 05/2024 - 08/2024
Skills: Java, Spring Boot, RESTful APIs, Vue.js, Element UI, Microservices, LLM Evaluation

- Designed and refined prompts for a digital AI HR assistant, increasing user satisfaction by 40%. Evaluated large language models (Ernie Bot, DouBao, Qwen), leading to final adoption by companies like Nike and Jobsdb.
- Developed a Spring Boot-based microservices backend and built RESTful APIs to automate candidate data evaluation, improving recruitment efficiency by 75%.
- Enhanced a Vue.js frontend with Element UI to ensure responsive design and improve user experience with custom message handling.

RESEARCH PROJECTS

Mars Ice Cap Layer Reconstruction 08/2024 - Present
Skills: Python, C++, PyTorch, Scikit-learn, Open3D, VTK, CUDA, Teem, SHARAD Radar

- Built a scalable pipeline to reconstruct stratified ice layers on Mars from noisy SHARAD radar returns, processing over 123 million triangle elements and enabling high-resolution surface modeling.
- Implemented a modified ridge extraction algorithm based on Schultz's Hessian analysis method, achieving 92% continuity of valid surface segments and reducing spurious detections by over 65% compared to Marching Cubes.
- Designed a feature-based classification model using Random Forest and geometric descriptors (ridge strength, triangle normals, image intensity), improving region-level segmentation precision by ~3× in post-visual inspection benchmarks.
- Developed a computer vision–based segmentation pipeline leveraging convolutional neural networks (CNNs) on radargram imagery, reducing spurious detections by over 60% and improving continuity of valid ice surfaces beyond classical feature-based methods.

LLM Safety Alignment via Soft Prompt Adversarial Training 01/2025 - 05/2025
Skills: Python, PyTorch, CUDA, Transformers

- Designed a novel safety training framework combining universal adversarial soft prompting and Direct Preference Optimization to enhance the adversarial robustness of LLMs without sacrificing performance.
- Trained a soft prompt jailbreak generator to expose vulnerabilities in base models (e.g., LLaMA3-8B), achieving up to +25% increase in harmful activation rate (HASR) during attack simulations.
- Improved model defense rate by over 70% across diverse adversarial attacks, while preserving performance on reasoning and instruction-following tasks. Achieved 10–25% gains in key safety metrics with minimal performance trade-off, validated on MT-Bench, AlpacaEval, and MMLU.

Trajectory Prediction in Free-Walking VR Environments 01/2025 - Present
Skills: Python, PyTorch, Transformers, OpenCV, Unity, Multi-Modal Sequence Modeling

- Developed a multi-modal predictive model with an encoder-decoder architecture for VR user trajectory forecasting. The encoder captures temporal motion embeddings, while the decoder integrates gaze direction and spatial scene layout via 2D floor plan masks.
- Achieved 15–20% reduction in Average Displacement Error (ADE) on the LocoVR dataset, demonstrating improved spatial-temporal accuracy over established baselines.
- Leveraged model outputs for intent inference, using predicted destinations to inform downstream large language models for goal recognition in immersive environments.

Animal Disease Risk Analysis and Visualization Platform 05/2025 - Present

Skills: Python, RESTful APIs, Excel Automation, JavaScript, React, Node.js, HTML

- Converted a legacy desktop tool (AD RiskCalculator) into a secure, web-based platform with optional offline access, reducing manual processing time by over 70% and enabling broader accessibility for researchers and field users.
- Integrated outputs with the USDA Animal Disease Spread Model (ADSM) by generating parameter files in compatible formats, streamlining simulation preparation for veterinary epidemiologists and policymakers.
- Automated model parameter collection by constructing domain-specific search pipelines across scientific databases and public internet sources, accelerating literature retrieval and compilation for region-specific diseases in Indiana.

SKILLS

Programming Languages: Python, Java, C++, JavaScript, SQL, Bash, C#, MATLAB, PHP, Ruby

Frameworks & Libraries: React, Node.js, Spring Boot, PyTorch, TensorFlow, Scikit-learn, OpenCV, Unity

Systems & Tools: UNIX/Linux, Git, Docker, RESTful APIs, MySQL, Postman

CV & Visualization: Deep Learning, CNNs, Transformers, Vision Transformers, Generative Models, 3D Reconstruction, Scientific Visualization, Image Segmentation

Robotics & AI: Reinforcement Learning, Multi-Agent Systems (MARL), Human-AI Collaboration, LLMs, Sequence Models, Agent-Based Simulation

Languages: Native proficiency in English & Mandarin, Beginner in French