Chenming GE

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EDUCATION

University of Washington College of Engineering | Global Innovation Exchange **Sep. 2025 – Mar. 2027**
Major: Master of Science in Technology Innovation (Robotics Track) GPA: 3.83/4
Courses: Managing Data and Signal Processing, Robotic Sensing and Mobility, Neuroscience (NEUSCI 401)

Tongji University School of Software Engineering **Sep. 2021 – Jun. 2025**
Major: Software Engineering GPA: 88.25/100
Courses: Linear Algebra, Probability and Mathematical Statistics, Statistics Analysis and Modeling, Data Structures, Computer Graphics

TECHNICAL SKILLS

Programming Languages: C++, Python

Machine Learning: PyTorch, scikit-learn, World Models, Reinforcement/Imitation Learning

Signal Processing / Data: Time-series Analysis, NumPy, SciPy, Pandas

Robotics / Hardware: ROS2, LeRobot, Isaac Lab, NVIDIA Jetson, 3D Printing

Tools: Docker, Git

RESEARCH

WM-Verdict: Benchmarking the Reliability of World-Model Verdicts about Policies **Sep. 2026 – Present**
Research Assistant, University of Washington Supervisor: Prof. Luyao Niu
Manuscript in preparation

- Led the experiment design of a benchmark testing whether latent-variable world models correctly predict policy success, pairing each imagined rollout with ground truth from a simulator restored to the identical start state.
- Built the reproducible evaluation infrastructure: a single-source config protocol, sham controls, replay verification, and automated run-validation checks, shared across collaborators and model families.
- Evaluated multiple world-model families across controlled perturbations, finding that aggregate success estimates track ground truth closely while per-start verdicts are substantially less reliable.

AV-Phys Bench: A Benchmark for Physical Commonsense in Joint Audio-Video Generation
Co-author Link: https://doi.org/10.48550/arXiv.2605.07061 **Mar. 2026 – May 2026**

- Contributed to benchmark design, proposing and refining evaluation categories including Visual/Audio Semantic Adherence and Visual/Audio Physical Commonsense.
- Led rubric refinement to improve inter-annotator consistency, and conducted data collection and annotation verification for physics-grounded audio-video scenes across Steady State, Event Transition, and Environment Transition categories.

MPAIL2 Real-World Deployment on SO-101 Robotic Arm **Mar. 2026 – Aug. 2026**
Research Assistant, UW Robot Learning Lab
Based on: https://arxiv.org/abs/2602.24121
Link: https://github.com/UWRobotLearning/mpail2/tree/so-101

- Built a hardware wrapper for the SO-101 robotic arm enabling real-world training with MPAIL2, an IRL-based world model algorithm that learns manipulation tasks purely from visual observations without action labels.
- Implemented a multi-stream observation alignment pipeline synchronizing onboard motor state and RealSense camera streams to match MPAIL2's latent input format, and translated trained policy outputs back to joint-level control signals on the physical arm.

Stable Inverse Rewards with Success Feedback **Sep. 2026 – Present**
Research Assistant, UW Robot Learning Lab

- Lead the real-world deployment on the SO-101 robotic arm for a study on whether online interaction with sparse success feedback can correct systematic errors in pretrained reward models.
- Building the hardware evaluation pipeline for manipulation tasks with recoverable failures and objective success metrics, enabling comparison of pretrained reward models, sparse rewards, and online-corrected rewards on real hardware.

Application and Improvement of Long-tail Bias Mitigation in HOI Detection **Dec. 2024 – May 2025**
Undergraduate Researcher (Thesis) ***Supervisor: Prof. Liang Shuang, Tongji University***

- Proposed a training framework based on the QPIC one-stage Transformer with two mitigation strategies: Affordance Transfer Learning (ATL)-inspired parameter enhancement and automated pseudo-labeling guided by teacher model supervision.
- Achieved consistent gains on V-COCO: overall mAP +1.6%, tail-class accuracy +5.1% to +6.3% without compromising overall precision.

Algorithm Structure for Real-time General Game Playing Agents **Jul. 2022 – Dec. 2022**
Independent Research
Link: https://www.researchgate.net/publication/372214848

- Evaluated the applicability of existing General Game Playing algorithms (heuristic-based and Monte Carlo/UCT) to real-time settings, and proposed an algorithm structure extending GGP agents from turn-based to real-time games.

PROJECTS

Dual-Arm Robotic Workspace Tidying System **Mar. 2026 – Present**
Team Lead (engineering, data collection design)
Link: https://github.com/Ghosty2003/Automated-Workstation-Reset.git

- Built a dual-arm manipulation system with two SO-101 arms that autonomously detects, picks, and organizes tools on a desktop workspace, using RealSense depth sensing and YOLO for object localization and classification.
- Designed the teleoperation data collection pipeline and trained an ACT (Action Chunking with Transformers) policy to generate joint trajectories for grasping and placing tools onto a tool rack.
- Implemented joint-level control interfaces bridging policy output and hardware execution for smooth, collision-aware dual-arm coordination.

Personalized Robot Disambiguation based on User State **Jan. 2026 – Mar. 2026**
Team lead, Final Project, Managing Data and Signal Processing (UW)

- Led the design of an adaptive autonomy framework enabling a robot to choose among Ask, Wait, or Act when facing ambiguous commands, conditioned on real-time user state including frustration signals extracted from voice.
- Trained a lightweight fully-connected reward model that adapts online from everyday interactions, using semantic embedding differences of user responses as preference signals, and used it to drive DPO training of the decision module.

MuSHR Full-Stack Autonomous Navigation System **Oct. 2025 – Dec. 2025**
Independent project Link: https://github.com/Ghosty2003/Taro.git

- Built a full-stack autonomous driving system on NVIDIA Jetson Orin with ROS: a particle filter fusing LiDAR and odometry for centimeter-level localization, and a Halton-sampled roadmap with Lazy A* and Dubins Path for kinematically feasible global planning.
- Implemented MPC with NumPy-vectorized kinematics and a live costmap for dynamic obstacle avoidance; validated the full pipeline through a stress test across 8 sequential waypoints after VESC calibration and PlotJuggler-based tuning.

Web3D Remote Model Transmission and Rendering **Sep. 2023 – Dec. 2023**
Team member, Smart3D Lab, Tongji University Advisor: Prof. Jinyuan Jia
Second Prize, Chinasoft Excellence Cup (2023)

- Developed a stable network transmission scheme for streaming remotely created 3D models to the browser, enabling reliable client-side Web3D rendering under varying network conditions.

INTERNSHIPS

Timeplus, Shanghai | Onsite **Jul. 2024 – Feb. 2025**
Intern, Backend Development Team

- Developed the C++ core engine of Proton, a real-time streaming database for high-throughput, low-latency data processing; extended the streaming type system with 6 new data types and ensured compatibility across 48 streaming aggregation functions.
- Resolved 3 long-standing bugs in distributed streaming storage, including merge-operation failures and data consistency issues between real-time insertion and query results.