

YIXIAO (JIMMY) FANG

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EDUCATION

University of Illinois Urbana-Champaign Aug 2024 – May 2026
Master of Science in Electrical and Computer Engineering | Robotics and AI Specialization GPA: 4.0/4.0

University of Illinois Urbana-Champaign Aug 2020 – May 2024
Bachelor of Science in Electrical Engineering | Minor in Computer Science GPA: 3.95/4.0

- **Honors:** Promise of Excellence Fellowship, Graduation with the Highest Honor, A.R. "Buck" Knight Scholarship

COURSEWORK

- Autonomous Systems
- Robot Dynamics & Control
- Machine Perception
- Computer Vision
- Artificial Intelligence
- Machine Learning
- Signal Processing
- Random Processes

TECHNICAL SKILLS

Programming: C, C++, Python, MATLAB, Assembly, System Verilog, Verilog

Robotics: ROS, ROS2, Gazebo, IsaacGym, iGibson, PyTorch, PyTorch3D, OpenCV, SciPy, scikit-learn, CUDA, SolidWorks

Work-flow tools: Linux, Git, LaTeX, Docker, Poetry, Jira

WORK EXPERIENCE

LifeFoundry Inc. May 2023 – Aug 2023
Robotics Software Engineer Intern Champaign, IL

- Refactored Automated Guided Vehicles (AGVs) communication systems using Socket and multithreading, increasing data transmission speed by 300 ms per cycle and ensuring robust integration with Docker and Git for streamlined deployments
- Collaborated with the mechanical team to build a vision-servo system with ArUco markers and a PID controller to enhance Panda Arm and AGVs precision by 15%, reaching mm-level accuracy in pose estimation
- Developed an OpenCV-based vision system enabling subpixel-level colony selection for biological experiments, achieving a 97% accuracy rate and increasing overall lab throughput by 20%
- Calibrated an OpenMV camera for datamatrix label detection, automating tube storage/retrieval to handle over 500 tubes daily

PROJECTS

F1-Tenth Car Autonomous System | *Python, C++, ROS, OpenCV* Mar 2024 – May 2024

- Designed a window-based lane detection algorithm with image filters and a D435 camera robust to various lighting conditions
- Integrated and optimized pure-pursuit controller with ROS on Jetson Nano, maintaining an average lane deviation under 5 cm
- Validated a dynamic obstacle-avoidance algorithm for safe autonomy, and fused a histogram of oriented image gradients (HOG) and LiDAR readings for human detection to lower the failure rate by 20%

Reinforcement Learning Simulation for Agricultural Robots | *Python, IsaacGym, CUDA, OpenCV* Jul 2023 – Sep 2023

- Developed a reinforcement learning pipeline in IsaacGym simulator to train field robots on row-following commands across 10 parallel environments, with training cycles accelerated by 25% using MPC-based control
- Configured RGB-D cameras for enhanced simulation fidelity, keeping consistent 20 FPS rendering using GPU acceleration

Colored Blocks Picker with Universal Robot (UR3) Arm | *Python, C++, ROS, OpenCV* Mar 2022 – May 2022

- Customized the Universal Robot driver and developed a low-level ROS message communication framework for UR3 compatibility
- Created an OpenCV blob detector that identified and located blocks with 100+ different colors within the robot workspace
- Combined inverse, forward kinematics, and CamShift object tracking to enable under 5mm precision of pick-and-place operations

RESEARCH EXPERIENCE

Delay-Compensated Video Feeds for Outdoor Mobile Robot Teleoperation Nov 2023 – Sep 2024
Research Assistant | Advised by Prof. Katie Driggs-Campbell Champaign, IL

- Designed a point cloud rendering module with PyTorch3D, generating a single novel-view image under 15ms
- Refined the DINOv2 depth estimation model for sub-20 ms inference time, handling point cloud construction over 15 FPS
- Integrated the video-upsampling model on the Terrasentia robot using ZED camera on Jetson AGX, enabling stable teleoperation for distances over 1 km while maintaining visual odometry accuracy within 2% with IMU-stereo fusion

Autonomous Crop Row Switching of Agricultural Robots Dec 2023 – Sep 2024
Research Assistant | Advised by Prof. Girish Chowdhary Champaign, IL

- Built a Gazebo simulation environment of agricultural scenarios by creating 50+ realistic URDF models
- Led a team of 3 to create a simulation pipeline that generated 10,000+ sample trajectories and RGB images, leveraging MPC control to support 92% completion rate for row-turning demonstrations in simulated crop fields
- Deployed and tested 2 work of autonomous navigation using Visual SLAM on the Terrasentia robot with ROS for baseline results

PUBLICATIONS

- (under review) N. Chakraborty*, **Y. Fang***, et al. "Towards Real-Time Generation of Delay-Compensated Video Feeds for Outdoor Mobile Robot Teleoperation." *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2025.