

YIXIAO (JIMMY) FANG

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EDUCATION

University of Illinois Urbana-Champaign

Master of Science in Electrical and Computer Engineering | Robotics and AI Specialization

Aug 2024 – May 2026

GPA: 4.0/4.0

University of Illinois Urbana-Champaign

Bachelor of Science in Electrical Engineering | Minor in Computer Science

Aug 2020 – May 2024

GPA: 3.95/4.0

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

COURSEWORK

- Machine Perception
- Computer Vision
- Artificial Intelligence
- Machine Learning
- Deep Learning
- Robot State Estimation
- Localization & Mapping
- Signal Processing

TECHNICAL SKILLS

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

Packages and Software: PyTorch, PyTorch3D, OpenCV, scikit-learn, CUDA, ROS, ROS2, Gazebo, IsaacGym

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

WORK EXPERIENCE

LifeFoundry Inc.

May 2023 – Aug 2023

Robotics Software Engineer Intern

Champaign, IL

- Coordinated with biological experts to develop a ResNet-based model for tiny colony segmentation at 97% accuracy, by experimenting image augmentation and applying transfer learning to optimize the model performance at subpixel level
- Collaborated with mechanical teams to build a vision-servo system with ArUco markers to enhance Automated Guided Vehicles (AGVs) precision by 15%, reaching mm-level accuracy in pose estimation
- Calibrated an OpenMV camera for datamatrix label detection, automating tube storage/retrieval to handle over 500 tubes daily

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

- Refined the vision transformer of state-of-the-art monocular depth estimation models to achieve under 20 ms inference time
- Designed a point cloud rendering module with PyTorch3D, generating a single novel-view image under 15 ms
- Constructed a U-Net based image inpainting model running at 36 FPS to fill holes in reconstructed RGB images from point cloud
- 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 sensor fusion

Autonomous Crop Row Switching of Agricultural Robots

Dec 2023 – Sep 2024

Research Assistant | Advised by Prof. Girish Chowdhary

Champaign, IL

- Built a baseline model with deep CNNs and attention networks to predict row-turning actions based on RGB and depth images
- Trained a diffusion model for policy synthesis to learn row-turning policies in both action and trajectory space, demonstrating a 15% improvement in failure rate from baselines
- Constructed policy representations using Zarr to reduce 30% of the time to train diffusion models on row-turning policies
- Deployed and tested 2 work of autonomous navigation using Visual SLAM on the Terrasentia robot for baseline results

Geometry-based Video Prediction with Visual Odometry Prediction and View Synthesis

Dec 2022 – Apr 2023

Research Assistant | Advised by Prof. Katie Driggs-Campbell

Champaign, IL

- Proposed a deep visual odometry module using Long Short-Term Memory (LSTMs) to predict future camera poses, achieving average pose error within 13% across 10 consecutive frames
- Optimized SynSin-based view synthesis model by enhancing depth accuracy and texture consistency, reducing visual artifacts by 11% and improving visual quality through photometric and perceptual loss functions
- Created a dataset of over 4000 indoor video sequences with accurate camera poses using iGibson simulator, enhancing the model performance by expanding the training dataset around 30%

PROJECTS

F1-Tenth Car Perception System | Python, C++, ROS, OpenCV

Mar 2024 – May 2024

- Designed a window-based lane detection algorithm with image filters, maintaining an average lane deviation under 3 cm
- Validated a dynamic obstacle-avoidance algorithm for safe autonomy, and fused a histogram of oriented image gradients (HOG) descriptor and LiDAR readings for person detection to lower the failure rate by 20%

Reinforcement Learning Simulation for Agricultural Robots | Python, IsaacGym, CUDA, OpenCV

Jul 2023 – Sep 2023

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

PUBLICATIONS

- 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.