Liwei Yang

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Education

Carnegie Mellon University - School of Computer Science (CMU SCS) *Pittsburgh, PA*
Master of Science in Robotic Systems Development *05/2025*
Relevant Coursework: Planning in Robotics, Learning for 3D Vision, Optimal Control, Robot Learning, Talking to Robots

National Taiwan University (NTU) *Taipei, Taiwan*
Bachelor of Science in Biomechatronics Engineering *06/2022*
Relevant Coursework: Robotics, Machine Learning, Medical Mechatronics, Data Structures and Algorithms, Image Processing

Skills

Programming: C/C++, Python (PyTorch), Java, MATLAB, Julia
Robotics: Motion Planning, Manipulation, Optimal Control, Computer Vision
Software/Tools: ROS2, MoveIt2, Nav2, Isaac Sim, Gazebo, Docker, Qt, Google Test, SolidWorks

Experience

Kaliber Labs *San Mateo, CA*
Robotics Research Engineer *07/2025 - Present*
- Implement behavior trees on top of **Nav2** stack to develop patient finding skill for mobile robots.
- Optimized Infinigen Indoors generator to produce diverse indoor scenes, validating the robustness of the navigation pipeline.
- Configured OmniGraph to bridge **Isaac Sim** and ROS2 for RGB-D and odometry data streaming.
- Integrated **MPC** controller on Aloha Solo to track patient's face, enabling engaging conversations.
- Evaluate grasp pose synthesis method performance for surgical tool grasping.

Smith+Nephew *Pittsburgh, PA*
R&D Engineer Intern (Robotics System Verification Engineering Intern) *05/2024 - 08/2024*
- Analyzed and visualized registration algorithm results for total hip arthroplasty, boosting registration efficiency by 75%.
- Crafted and automated 20 C++ tests using **GoogleTest**, enhancing code reliability and reducing testing time by 50%.
- Executed 15 manual test cases, identifying multiple bugs for the development team and accelerating product launch.

Center for Artificial Intelligence and Advanced Robotics *Taipei, Taiwan*
Research Assistant, topic: Companion Healthcare Robot *02/2022 - 10/2022*
- Leveraged **SQLite** to centralize physiological data from multiple users, improving system scalability and user management.
- Integrated a smartwatch with the robot using Bluetooth Low Energy protocol, optimizing data synchronization capabilities.

Robots and Medical Mechatronics Lab *Taipei, Taiwan*
Undergraduate Researcher, topic: Remote Swabbing Robot *09/2020 - 03/2022*
- Constructed a statistical morphing oral model using CT images in **3D Slicer**, achieving landmarks' accuracy of 2 mm.
- Won sponsorship worth $1600 USD from Taiwan's Ministry of Science and Technology.
- Won the best student paper award at the Conference on Advanced Robotics and Intelligent Systems.

Selected projects

MRSD Capstone (Sponsored by Smith+Nephew) *Pittsburgh, PA*
Project Manager, topic: Tekkneeca – Assistive Surgical Robot for Orthopedics *11/2023 - 11/2024*
- Integrated ICP registration to replace invasive IR trackers for surgical robots, achieving drilling accuracy of 2 mm.
- Adapted **MoveIt2** hybrid-planning stack with KUKA LBR Med 7 to account for bone motion and define recovery behavior.
- Managed a team of 5 using ScrumBan, orchestrating two major live demonstrations within a year.

I Can't Do It – Bimanual Robotic Arm Collaboration *Pittsburgh, PA*
10/2024 - 12/2024
- Harnessed the reasoning capabilities of OpenAI **GPT-4o** to foster collaboration between two robotic arms.
- Enabled talking to robots by integrating OpenAI **Whisper** speech-to-text model into ROS2.
- Developed a generalized **Pilz** industrial motion planning stack using MoveIt2 and ROS2 parameters.

Publications

Autonomous Robotic Assistant for Knee Replacement Surgery.
- **L. Yang,** P. S. Baweja, S. Gupta, Q. Wu, and A. Warrier, International Conference on Robotics and Automation (ICRA), Late Breaking Presentation

A Morphology Model for the Cyber-physical Operation of a Remote Swabbing Robot.
- **L. Yang**, P. Yen, International Journal of iRobotics.