

Zhengyang Kris Weng

Robotic Systems R&D - Physical AI - Engineering

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Professional Summary

Experienced robotics engineer with 5+ years developing surgical and domestic robotic systems at leading companies. Expert in robotic arm and actuator design, calibration systems, and control software with proven track record in system integration and R&D. M.S. in Robotics with focus on dexterous manipulation, robot control and machine learning. Strong background in mechanical design, embedded systems, and real-time control.

Professional Experience

Robotic System Integration Engineer

Feb 2026 – Present

Sunday Robotics, Mountain View, CA

- **System Engineering:** Bring up, test and evaluate key components. Maintain motor and sensor drivers and related software tools in Python/C++
- **Test & Integration:** Integrate and test robotic systems, triage and debug cross-disciplinary issues spanning mechanical, electrical, firmware, and software systems

Senior Mechanical Engineer

Oct 2022 – Feb 2026

Johnson & Johnson MedTech, Santa Clara, CA / Remote

- **System Hardware R&D:** Core team member for v2 robotic arm development, contributing to system specifications, design reviews, and validation strategy for the Monarch robot surgery platform
- **Verification & Validation:** Developed test cases and fixtures and conducted V&V for surgical robotic devices, ensuring compliance with performance and safety requirements
- **Software Development:** Developed robot calibration software in C++ and designed admittance control visualization prototypes using Python and CoppeliaSim
- **Innovation & IP:** Invented fluid management system for Monarch Urology procedures (WO2025257720A1)
- **Leadership & Development:** Transitioned to remote part-time work while pursuing M.S. in Robotics (2024-2025), maintaining full project responsibilities and deliverables

Mechanical/Robotics Engineer

Jun 2021 – Oct 2022

Neocis Inc., Miami, FL

- **Mechatronics R&D:** Designed a 7-DoF robotic guidance arm for the Yomi S robot, including kinematic analysis and component specification. Developed a series of custom compact high-precision joint actuators from scratch
- **System Integration:** Led build and integration across three prototype arm iterations, achieving sub-millimeter accuracy for robotic dental surgery
- **Calibration Algorithms:** Developed optical robot kinematic calibration methods using optimization with regularization, enhancing accuracy and robustness
- **Leadership:** Mentored interns and delivered training to new hires on robotics hardware team
- **Career Progression:** Promoted to Senior Engineer (Aug 2022) in recognition of leadership and contribution

Mechanical Engineer Co-op

May 2020 – Dec 2020

Harmonic Bionics Inc., Austin, TX

- **Exoskeleton Development:** Designed robotic systems for 14-DoF rehabilitative upper extremity exoskeleton, including linear sizing mechatronic systems and handheld user interface
- **Operations:** Launched company machine shop, authored safety SOPs, and manufacturing equipment training

Education

M.S. in Robotics

Sep 2024 – Aug 2025

Northwestern University, Evanston, IL Focus: Dexterous Manipulation, Kinematic Control, Imitation Learning

B.S. in Mechanical Engineering

Sep 2016 – May 2021

Georgia Institute of Technology, Atlanta, GA Concentration: Robotics and Control Systems

Open-Source Projects

Hand Tracking Streamer: Meta Quest VR App for Tracking Hand Landmark Telemetry 2026
Zhengyang Kris Weng, San Jose, CA

- Developed a lightweight hand telemetry utility and companion SDKs that turn a Meta Quest headset into a precision controller for robotics teleoperation and motion capture. Available on Meta Horizon Store for free

LeVR: A Modular VR Teleoperation Framework for Imitation Learning in Dexterous Manipulation 2025
Northwestern University, Evanston, IL

- Developed modular VR teleoperation framework integrated with LeRobot platform for imitation learning in robotic manipulation
- Released open-source implementation (LeFranX) for Franka robotic arms and RobotEra XHand manipulator with high-frequency teleoperation and imitation learning
- Collected dataset of 100+ expert demonstrations and validated framework with state-of-the-art visuomotor policies

BiDexHand: Open-Source 16-DoF Dexterous Hand 2024-2025
Northwestern University, Evanston, IL

- Designed low-cost 3D-printed 16-DoF anthropomorphic hand with a complete ROS 2 control stack for joint-level control, functional retargeting, inverse kinematics, simulation and teleoperation functions
- Implemented vision-based calibration using AprilTags and integrated numerical IK solver with MoveIt!2 for real-time control with Franka robot arm

Technical Skills

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|----------------------------------|---|
| Robotics & Simulation | Robot kinematics & dynamics, kinematic calibration, ROS 2, CoppeliaSim, Gazebo, MuJoCo, PyBullet, RViz, Unity |
| Software Development | Python (NumPy, Pandas, OpenCV), C++, MATLAB, Git, Linux, Bash |
| ML Frameworks | PyTorch, TensorFlow, HF Transformers, scikit-learn |
| Mechanical Design | SolidWorks (CSWE), OnShape, Fusion 360, ANSYS FEA, rapid prototyping, 3D printing (SLA, FDM, SLS, MJF) |
| Electrical | PCB design (KiCAD), oscilloscope, soldering |
| Machining | Milling, lathing, water jetting, laser cutting |
| Languages | English (native), Mandarin Chinese (native) |

Publications & Patents

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- **Z.K. Weng**, M. Elwin, H. Liu, "LeVR: A Modular VR Teleoperation Framework for Imitation Learning in Dexterous Manipulation", *arXiv preprint*
 - **Z.K. Weng**, "BiDexHand: Design and Evaluation of an Open-Source 16-DoF Biomimetic Dexterous Hand", *IEEE ICRA 2025 Dexterity Workshop*, Spotlight Presentation
 - A. Harapanahalli*, E. Muly*, H. Welch*, T. Brumfiel*, **Z.K. Weng***, et al. "Towards a Biomimetic and Dexterous Robot Avatar: Design, Control, and Kinematics Considerations," *IEEE/ASME AIM 2020*, Best Breaking Results Poster (*equal contribution)
 - International Patent WO2025257720A1 — "Fluid Management System for Medical Procedures"
 - US Patent US11842304B2 — "Accessible Ride Hailing and Transit Platform"

Awards & Recognition

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- IEEE ICRA 2025 Dexterity Workshop — Spotlight Presentation for BiDexHand research
 - IEEE AIM 2020 — Best Late Breaking Results Poster for biomimetic robotics
 - First Place, 2021 Georgia Tech VIP Innovation Competition (Hardware, Devices & Robotics)
 - Georgia Tech President's Undergraduate Research Award (2021)
 - Toyota Mobility Foundation Challenge Winner (2017)
 - Certified SolidWorks Expert (CSWE) — Highest mechanical design certification awarded by Dassault Systèmes