Aaron Kim

akim.jinsoo@gmail.com | (408) 710 - 2221 | aaronjkim.com | linkedin.com/in/akim-jinsoo

Education

The University of Texas at Austin (*Integrated BSME/MSE Program*) Aug 2020 - May 2026
Master of Science, Mechanical Engineering (*NSF Research Traineeship Recipient*) GPA: 3.8/4.0
Bachelor of Science, Mechanical Engineering GPA: 3.6/4.0

Experience

Human Centered Robotics Lab (HCRL), UT Austin - **ARISTO Hand** May 2025 - Present
Graduate Student Fellow

- Led development of a tendon-driven anthropomorphic robotic hand with decoupled joints and active distal hyperextension.
- Designed finger kinematics for scraping, edge-first contact, and sub-millimeter object pickup on flat surfaces and fine manipulation.
- Integrated capacitive tactile arrays and 6-axis fingernail force-torque sensors with QDD actuators, increasing finger range of motion by 50%.
- Developed embedded firmware and CAN-bus communication for motor control, high-rate sensor streaming, and real-time closed-loop force regulation.
- Experimentally validated distal hyperextension, achieving a 2.76× increase in grasp stability for thin objects (0.75 mm) compared to flexion-only kinematics.

HCRL, UT Austin - **PLATO Hand** Aug 2024 - May 2025
Graduate Student Fellow

- Designed and manufactured a three-fingered robotic hand using a 5-bar linkage with rigid, sensorized fingernails.
- Achieved over 95% coverage of the Cutkosky Grasp Taxonomy and expanded coverage to fine-grained grasping.
- Built a teleoperation and data-collection pipeline with minimum-jerk planning and real-time Foxglove visualization.
- Trained reinforcement learning (RL) grasp policies in NVIDIA Isaac Sim for precision fingernail-first manipulation.

Sony Corporation - Fundamental Robotics Lab, Tokyo May 2024 - Aug 2024
Research Intern

- Designed a compact multi-finger robotic hand using harmonic drives under strict force constraints, increasing fingertip torque by 30× (0.03 Nm to 0.9 Nm).
- Built and validated a drivetrain test bench for back-drivability and torque-control characterization of the actuators.

HCRL, UT Austin Jan 2023 - May 2024
Undergraduate Researcher

- **Draco 3 Humanoid:** Designed and FEA-validated force–torque sensor mounts for structural safety and supported full-body mechanical integration.
- **Bumpy Bot:** Implemented a ROS-based navigation stack with SLAM and velocity filtering for consistent autonomous operation on an omni-directional base.

Publications

- **Aaron Kim**, et al. "ARISTO Hand: Sensing-Driven Distal Hyperextension for Fine-Grained Manipulation," *IEEE/ASME Int. Conf. on Advanced Intelligent Mechatronics (AIM)*, manuscript under review.
- Dong Ho Kang, **Aaron Kim**, et al. "PLATO Hand: Shaping Contact Behavior with Fingernails for Precise Manipulation," *IEEE Robotics and Automation Letters (RA-L)*, manuscript under review.

Skills

Design & Hardware: SolidWorks, Onshape, GD&T, Mechanism Design, 3D Printing, Machining, Sensor Integration, Actuator Selection, Mechatronics
Software & Control: ROS/ROS2, C++, Python, MATLAB, Embedded Firmware, CAN Bus, Reinforcement Learning (Isaac Sim/Lab), Foxglove Studio, Force Control, Haptics, SLAM