

# Aaron Kim

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## Education

<b>The University of Texas at Austin</b> ( <i>Integrated BSME/MSE Program</i> )	Aug 2020 - May 2026
Master of Science, Mechanical Engineering ( <i>NSF Research Traineeship Recipient</i> )	GPA: 3.7/4.0
Bachelor of Science, Mechanical Engineering	GPA: 3.6/4.0

## Experience

<b>Human Centered Robotics Lab, The University of Texas at Austin</b> <i>Graduate Student Fellow</i>	Aug 2024 - Present
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### PLATO Hand (1st Generation)

- Designed and manufactured a three-fingered robotic hand using a 5-bar linkage architecture inspired by human musculoskeletal anatomy with sensorized fingernails, achieving over 95% coverage of the Cutkosky Grasp Taxonomy.
- Developed control and UI software for intuitive teleoperation, including pre-defined position saving, minimum-jerk trajectory planning, real-time data collection, and robot visualization via Foxglove Studio.
- Applied reinforcement learning (RL) in NVIDIA Isaac Sim to optimize grasping policies for complex object manipulation, including fingernail-based grasping of flat objects.

### ARISTO Hand (2nd Generation)

- Led development of a tendon-driven robotic hand featuring double-parallel tendon routing and decoupled joints for human-like dexterity.
- Integrated tactile, force-torque, proprioceptive, and RGB-D sensors to achieve human-like sensing while improving manufacturability, range of motion (+50%), and back-drivability.
- Utilized imitation learning to validate the role of multimodal sensing in data collection and deployed learned policies for complex manipulation tasks.
- Developed CAN bus communication and embedded firmware for reliable actuator control and high-rate sensor streaming.

<b>Sony Corporation - Fundamental Robotics Lab, Tokyo, Japan</b> <i>Research Intern</i>	May 2024 - Aug 2024
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- Designed a multi-finger robotic hand meeting 0.634 N fingertip force and torque specifications using harmonic gearboxes and compact direct-drive motors.
- Increased torque from 0.03 Nm to 0.9 Nm with a 30:1 reduction gearbox; designed and built a custom test bench to verify performance, enabling dexterous manipulation of small objects (e.g., Jenga blocks).

<b>Human Centered Robotics Lab, The University of Texas at Austin</b> <i>Undergraduate Researcher</i>	Jan 2023 - May 2024
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- Draco 3 Humanoid Robot:** Designed and validated force-torque sensor mounts through finite element analysis (FEA) for structural integrity and safety compliance; maintained and enhanced humanoid hardware systems.
- Bumpy Bot:** Developed ROS-based navigation for an omni-directional mobile robot, integrating LiDAR, SLAM, and velocity filtering for smooth trajectory tracking and autonomous operation.

## Publications

Dong Ho Kang, **Aaron Kim**, and Luis Sentis. "PLATO Hand: Dexterous Robotic Hand with Fingernails for Versatile Force Interaction," *IEEE Robotics and Automation Letters*, under review, 2025.

## Skills

**Design/Fabrication:** SolidWorks, Onshape, Inventor, 3D Printing, Machining, GD&T, Mechanism Design, Tolerance Analysis

**Modeling/Control/Embedded:** ROS, C++ , Python, MATLAB, FEA, Kinematics, Trajectory Optimization, CAN Bus, RL (Isaac Lab), Sim-to-Real, Arduino, Sensors, Signal Processing, Motor Control