Linus Kim

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EDUCATION

The University of Texas at Austin, Cockrell school of Engineering   Austin, TX

Master of Science in Engineering - Mechanical Engineering; Robotics   May 2027

Bachelor of Science - Mechanical Engineering; Robotics & Mechatronics   Aug 2019 – May 2025

SKILLS

- Software: Python, C++, Nvidia Newton, Isaac Lab, Pinocchio, Mujoco, ROS2, MATLAB/Simulink, Git/GitHub, W&B
- Hardware: EtherCAT, Motor Control Systems, CNC Machining, 3D Printing (FDM, SLA)

RESEARCH EXPERIENCES

Human Centered Robotics Lab (PI: Dr. Luis Sentis)   Austin, TX

Graduate Research Assistant   Jan 2025 - present

- Designed the electromechanical architecture for a 50+ DoF humanoid head optimized for impact-resistance for deployment on a walking robot while maintaining state-of-the-art capabilities for natural human interaction
- Led the end-to-end hardware development of the DRACO 4 humanoid lower body, executing complex assemblies in Onshape and validating designs through hybrid fabrication (CNC machining, FDM/SLA 3D printing)
- Architected a bi-level co-design pipeline (hardware/control) using Nvidia Newton and Isaac Lab, implementing custom reward functions and event handlers in Python and C++ to optimize humanoid performance
- Implemented a hard real-time ROS2/EtherCAT communication interface (1000Hz) using the SOEM library, ensuring precise synchronization between the control PC and Synapticon actuators
- Designed a custom mechanical test rig for impedance control validation, executing real-time algorithms with high-fidelity encoder feedback over EtherCAT

Rehabilitation and Neuromuscular Robotics Lab (PI: Dr. Ashish Deshpande)   Austin, TX

Undergraduate Research Assistant   June 2024 – Aug 2024

- Developed 2 tensioner mechanisms that maintain the string system's reliability with Solidworks
- Fabricated and assembled a pair of cable pulley robotic fingers with improved structural integrity and joint play with 3D printing (FDM)
- Researched sensorless force estimation through current monitoring with GL80 KV30 actuators

PROJECTS

Custom Mini Cycloidal Reduction Mechanism   Sep 2025 – present

- Designed an extremely small (16mm x 10mm) 20:1 cycloidal gear reducer utilizing rolling elements for robotic hand actuation
- Developed CAD models and performed kinematic analysis to optimize gear geometry; manufactured two prototypes using SLA 3D printing with iterative design refinement
- Conducting comprehensive performance testing for torque capacity, efficiency, and backlash

Basketball Robot   Aug 2025 – Dec 2025

- Designed the flywheel assembly, ball loading mechanism, and moving platform with CAD (Onshape); fabricated using FDM 3D printing and laser cutting
- Implemented trajectory calculation algorithms based on IR and IMU sensor feedback; developed PID control system for flywheel velocity control and automated shooting sequence in C++

Battlebot   Jan 2025 – May 2025

- Designed and FEA simulated a custom battlebot using CAD (Solidworks)
- Fabricated the battlebot with hand machined and 3D printed parts
- Built a simple RC control system using off the shelf electronics parts for driving and controlling

Pick and Place Mechanism   Mar 2024 – Apr 2024

- Simulated and prototyped an 8-bar pick and place mechanism using kinematic analysis and Newton-Raphson numerical methods in MATLAB/Python; integrated end effector and demonstrated at live event with 100+ participants