

Kayden Knapik

Robotics Engineer | RL & Control



About me

MSc Robotics student with hands-on experience in Sim2Real reinforcement learning and bipedal locomotion. Passionate about designing and programming robots that transition seamlessly from simulation to the real world.

Contact

- kaydenknapik.com
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Skills

Core Frameworks:

Isaac Lab, MuJoCo, PyTorch

Languages:

Python, C++, C

Control & Hardware:

Sim2Real, MIT Control Mode, CAN Bus, NVIDIA Jetson

Tools:

Linux, Git, CAD (Fusion360)

Honors & Awards

Tech United Student Team:

2024 World Champion, RoboCup MSL Eindhoven

2023 World Champion, RoboCup MSL Bordeaux

First Tech Challenge

2x Regional First Place Winner (2021, 2022)

Languages

English: Native

Dutch: Intermediate (B1)

Interests

Reinforcement Learning
Sim2Real Transfer
Humanoid Locomotion
Imitation Learning

KEY PROJECTS

2025-26

BDX-R: Open Source Bipedal Walker

Independent & BEP

Tech Stack: Isaac Lab, Jetson Orin Nano, PyTorch, Python, CAD

- Engineered a 10-DOF bipedal robot inspired by Disney's BD-X, powered by an NVIDIA Jetson Orin Nano.
- Developed an end-to-end RL pipeline in Isaac Lab, successfully training a policy for stable walking and deploying it to hardware (Sim2Real).
- Lowered the "Sim2Real Gap" for low-cost actuators, achieving real-world walking after the initial thesis conclusion (Grade: 9/10).
- Currently integrating the head for expressive motion.
- Impact:** Open-sourced the entire build to serve as a blueprint for accessible RL robotics.

2026

Sim2Real Humanoid Locomotion

Tech United Student Team

Tech Stack: Isaac Lab, MuJoCo, Sim2Real Transfer

- Working on the migration of locomotion policies from legacy Isaac Gym to the modern Isaac Lab framework.
- Developing custom walking gaits tailored to the T1 humanoid hardware, validating simulation physics against real-world dynamics.
- Currently implementing MuJoCo Lab environments to further refine policy robustness.

2025

Python Interface for CAN Bus Control

Open Source

Tech Stack: Python, CAN Bus, MIT Control Mode

- Developed a custom Python Driver to control these actuators outside of the studio environment, enabling integration into custom bipedal designs.
- Implemented full "MIT Control Mode" (Position, Velocity, KP, KD, Torque) over CAN Bus for high-frequency, low-latency communication.
- Impact:** Tutorial and code have garnered 40,000+ views, helping thousands of engineers use these motors.

2024

Design of a Low Cost Robotic Platform for RoboCup

Tech United Student Team

Tech Stack: CAD, VESC, Raspberry Pi, Python

- Designed and built an open-source, omni-wheeled robot platform to lower entry barriers for the RoboCup Middle Size League.
- Managed full lifecycle: CAD design, component selection, VESC configuration, and Inverse Kinematics programming.

EDUCATION

2025-Pres

MSc Mechanical Engineering - Robotics

TU Eindhoven

Relevant Coursework: Optimal Control & Reinforcement Learning, Multi-body Dynamics, Model-Based Control, Software Engineering for AI.

2022-25

BSc Mechanical Engineering

TU Eindhoven

EXPERIENCE

2021

Robotics Intern

Cyberdyne Robotics / Brooks Rehab, USA

Operational support for HAL (Hybrid Assistive Limb) exoskeletons during patient rehabilitation sessions.