Tund Theerawit

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EDUCATION

University of Wisconsin-Madison **Graduation date:** ***May 2027***
B.S. Mechanical Engineering
Research Focus: Embodied AI, Differentiable Simulation (JAX), Reinforcement Learning. **GPA: 3.83 / 4.0**

RELEVANT COURSEWORK

Data Science Programming I & II (Python) • Linear Algebra • Differential Equations • Dynamics Systems • Geometric Modeling • Statistics

SKILLS & INTERESTS

Programming: Python, C++, PyTorch/JAX, Git, Linux/Bash
Machine Learning & Simulation: JAX/MJX (Differentiable Physics), Reinforcement Learning (PPO), Sim-to-Real Transfer, Domain Randomization, Massive Parallel Simulation, Policy Optimization, Custom Reward Design, MuJoCo (MJX), Robot Kinematics & Dynamics
Robotics: ROS 2, OpenCV, Mechatronics Integration, PCB Soldering/Debugging
Tools: SolidWorks, Physics Engines

SUMMARY

Mechanical Engineering student at UW–Madison with hands-on experience building physics-accurate digital twins and training reinforcement learning policies for legged locomotion. Specialized in domain randomization, reward shaping, and Sim-to-Real transfer using MuJoCo (MJX/JAX) on the Pupper quadruped platform. Passionate about leveraging differentiable physics to accelerate high-DoF robot autonomy.

EXPERIENCES

LeggedAI Lab| Madison, Wisconsin, United States **May 2025 – Present**
Department of Mechanical Engineering, leggedai.com
Robotics Engineer Undergraduate Researcher

- Developed a **massively parallelized simulation pipeline** using **JAX/MJX**, enabling the generation of millions of interaction steps per second to train locomotion policies significantly faster than real-time.
- Engineered **Sim-to-Real pipeline** with domain randomization and PPO policies. Overcame jerky, inefficient motion by **designing custom reward functions** (velocity tracking, torque penalties, smoothness constraints) to achieve stable 0.75 m/s forward-velocity tracking with a 10% reduction in simulated energy consumption.
- Built a **hardware-in-the-loop "Digital Twin"** pipeline to validate simulation fidelity, visualizing real-time sensor data against physics model predictions to identify and correct dynamics mismatches.
- Demonstrated **adaptive agent capabilities** by training PPO policies that achieved zero-shot recovery from hardware failures (motor burnout), allowing the robot to maintain high-speed locomotion on three legs.

CATS Lab| Madison, Wisconsin, United States **July 2024 – August 2024**
Department of Civil & Environmental Engineering, Affiliate of Electrical & Computer Engineering
Summer Undergraduate Research

- Developed an autonomous navigation system for a Ranger omnidirectional robot using OpenCV/Python vision pipelines; integrated ROS 2 nodes for real-time sensor–motor communication, control, and data processing across indoor and outdoor environments.

AI Group internship | Bangkok, Thailand **July 2023 – August 2023**
Project Assistant

- Implemented real-time C++ A* path-planning and control algorithms for autonomous guided vehicles in industrial factory settings; integrated PLC/Ladder logic within a cross-functional team.