DANIEL MAREW

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Scholar § Linkedin

RESEARCH EXPERIENCE FOCUS

- **Humanoid Robot Control**: RL sim-to-real transfer, MPC, Whole-body Control
- **Humanoid Robot Development**: Design validation, System ID and electrical system design
- **Efficient Humanoid Locomotion**: Actuated-Toe enabled efficient humanoid locomotion

EDUCATION

University of Massachusetts Amherst, Ph.D. Candidate Comp Sci. (GPA 4.0) 2019-Expected 2025
Carnegie Mellon University , MSc. Elec. and Comp. Engg. (GPA 3.98) 2017 - 2018
Addis Ababa University, BSc. Elec. and Comp. Engg. (GPA 3.87) 2012 - 2017

EXPERIENCE

Research Assistant, DARoS Lab-UMass Amherst, MA (Advisor: Donghyun Kim) May 2021 - now

- (VID) Actuated Toe-Enabled efficient humanoid locomotion using imitation learning.
- (VID) System Identification and RL sim-to-Real for robots with kinematic loops and cooperative actuation.
- (VID) Developed a trajectory optimization tool to re-target human MoCap to kinodynamically feasible and hardware consistent robot trajectories Video.
- (VID) Designed, built, and formulated an MPC dynamic walking controller for point-foot biped.

Research Assistant, LPR Lab-UMass Amherst, MA (Advisor: Rod Grupen) Sep 2019 - May 2021

- Applied Bayesian optimization for energetic overhand throwing on a WIP humanoid (Ubot-7).

Research Intern, iCog-Labs, Addis Ababa, Ethiopia Sep 2015 - May 2017

- Designed and built a mobile home companion robot (SHUC) with autonomous navigation. [GitHub]

PUBLICATIONS

(2024 IROS) StaccaToe: A Single-Leg Robot that Mimics the Human Leg and Toe
(2024 Humanoids) Learning Generic and Dynamic Locomotion of Humanoids Across Discrete Terrains
(2024 Humanoids) A Biomechanics-Inspired Approach to Soccer Kicking for Humanoid Robots
(2023 Humanoids) Integration of Riemannian Motion Policy with Whole-Body Control for Collision-Free Legged Locomotion (Oral)

TECHNICAL SKILLS

Languages and Frameworks : Python, C/C++, Pytorch, Jax, Eigen, CasADi, Pinocchio, Crocoddyl
Control: RL, IL, MPC, Whole-Body Control, RMPflow
Simulation: IsaacGym, IsaacSim, MuJoCo, Raisim, Simple
Hardware: PCB Design (KiCad/EasyEDA), CAD (Onshape), Embedded Systems, CAN-bus

AWARDS

Spaulding-Smith Fellow ($50,000)
Mastercard Foundation Scholar, Carnegie Mellon University ($40,000)