Kevin Green

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Employment History

Agility Robotics — **Salem, OR**

Software Engineer III, Robotics — *Apr 2024-Present*

Software Engineer II, Motion Planning — *Aug 2022-Apr 2024*

- Designed, implemented, and deployed a new nonlinear, MPC locomotion controller
- Developed and deployed a RL locomotion policy for step recovery behaviors, which was the first RL control policy used in customer deployments
- Primary locomotion software engineer responsible for bringing up, tuning, and initial testing of two major Digit robot hardware revisions

Oregon State University: Dynamic Robotics Lab — **Corvallis, OR**

Graduate Research Fellow — *Sep 2017-Aug 2022*

- Developing bipedal control hierarchies that use machine learning and online optimization
- Developing physics-first RL and machine learning approaches for agile legged locomotion
- Implementing model predictive control footstep planning and operational space control inverse dynamics

University of Michigan Health System: Department of Otolaryngology — **Ann Arbor, MI**

Undergraduate Research Assistant — *May 2016-Jul 2017*

- Designed customized glasses for children with facial deformities from facial scans using 3D printing
- Created high fidelity surgical simulation models from raw CT data using Materialise Mimics and 3-Matic
- Processed and produced surgical reference models for Juvenile Nasopharyngeal Angiofibroma from patient CT data

University of Michigan: RAM (Robotic and Motion) Research Lab — **Ann Arbor, MI**

Undergraduate Research Assistant — *Jan 2014-May 2016*

- Designed, programmed, and tuned a virtual model control walking controller in simulation and hardware for the five link series elastic biped, RAMone
- Designed, manufactured, and programmed an active support system to catch a bipedal robot when it falls
- Prototyped and tested inductance based pneumatic muscle force and position sensors

Whirlpool Corporation — **Saint Joseph, MI**

Engineering Intern — *Jun-Aug 2013, May-Aug 2014*

- Designed, prototyped, and evaluated novel systems to remove all puddled water from items in dishwashers
- Correlated a dynamic model of a washing machine to test data in order to predict the effects of design changes

Education

Oregon State University — **Corvallis, OR**

Ph.D. Robotics — *Sep 2017-Aug 2022*

Dissertation: Agile Bipedal Locomotion via Hierarchical Control by Incorporating Physical Principles, Learning, and Optimization

Advisors: Jonathan Hurst and Ross L. Hatton

University of Michigan — **Ann Arbor, MI**

B.S.E. Mechanical Engineering, Minor in Mathematics — *Sep 2013-Apr 2017*

Summa Cum Laude

Advisor: C. David Remy

Selected Publications

Kevin Green, Yesh Godse, Jeremy Dao, Ross L. Hatton, Alan Fern, and Jonathan Hurst, "Learning spring mass locomotion: Guiding policies with a reduced-order model," *IEEE Robotics and Automation Letters*, vol. 6, no. 2, pp. 3926–3932, 2021.

Jonathan Hurst and **Kevin Green**, "Series elastic actuation," in *Encyclopedia of Robotics*, Marcelo H. Ang, Oussama Khatib, and Bruno Siciliano, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2020, pp. 1–12.

Ryan Batke, Fangzhou Yu, Jeremy Dao, Jonathan Hurst, Ross L. Hatton, Alan Fern, and **Kevin Green**, "Optimizing

bipedal maneuvers of single rigid-body models for reinforcement learning," in *2022 IEEE-RAS International Conference on Humanoid Robots*, 2022.

Fangzhou Yu, Ryan Batke, Jeremy Dao, Jonathan Hurst, **Kevin Green**, and Alan Fern, "Dynamic bipedal maneuvers through sim-to-real reinforcement learning," in *2022 IEEE-RAS International Conference on Humanoid Robots*, 2022.

Kevin Green, John Warila, Ross L. Hatton, and Jonathan Hurst, "Motion planning for agile legged locomotion using failure margin constraints," in *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022.

Jonah Siekmann, **Kevin Green**, John Warila, Alan Fern, and Jonathan Hurst, "Blind bipedal stair traversal via sim-to-real reinforcement learning," in *Robotics: Science and Systems*, 2021.

Kevin Green, Ross L. Hatton, and Jonathan Hurst, "Planning for the unexpected: Explicitly optimizing motions for ground uncertainty in running," in *2020 IEEE International Conference on Robotics and Automation (ICRA)*, 2020, pp. 1445–1451.

Taylor Apgar, Patrick Clary, **Kevin Green**, Alan Fern, and Jonathan Hurst, "Fast online trajectory optimization for the bipedal robot cassie," in *Robotics: Science and Systems*, 2018.

Awards, Fellowships, and Records

2022: Guinness World Record Fastest 100m by a bipedal robot: 24.73 s
2021: World Record Fastest Unsupported Bipedal Robot 5k: 43:59.53 (Claimed, unverified)
2021: Co-author of Finalist: IEEE ICRA Best Paper Award in Cognitive Robotics
2017: Graduate Research Fellowship, National Science Foundation

Service and Teaching

Teaching Experience

- ENGR 212 Dynamics. Oregon State University. — Instructor of record
- ME 317 Intermediate Dynamics. Oregon State University. — Teaching Assistant
- ROB 542 Actuator Dynamics. Oregon State University. — Teaching Assistant
- ROB 521 Research Robotics. Oregon State University. — Teaching Assistant

Mentorship

- Fangzhou Yu, Oregon State Robotics MS Student — RAI Institute
- Ryan Batke, Oregon State Robotics MS Student — Sanctuary AI, RSL
- Jonah Siekmann, Oregon State Undergraduate and Robotics MS student — Agility Robotics
- Yesh Godse, Oregon State Undergraduate — Agility Robotics
- John Warila, Oregon State Undergraduate — Electric Era
- Andrew Sanders, Oregon State Undergraduate — Garmin
- Grace Stridick, University of Michigan UROP Student — SpaceX

Peer Reviewer

IEEE T-RO, IJRR, IEEE RA-L, Mechanism and Machine Theory, RSS, IEEE ICRA, IEEE IROS

Technical Skills

Proficient with: C++, Python, Eigen, Pytorch, IsaacSim, MuJoCo
Comfortable with: MATLAB, Typescript, AVRO, RBDL, JIRA, Trello, Confluence, Git & Github, bazel

References available upon request