

Kevin Green

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Education

Oregon State University

Ph.D. Robotics

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

Advisors: Jonathan Hurst and Ross L. Hatton

Corvallis, OR

Sep 2017–Aug 2022

University of Michigan

B.S.E. Mechanical Engineering, Minor in Mathematics

Summa Cum Laude

Advisor: C. David Remy

Ann Arbor, MI

Sep 2013–Apr 2017

Professional Appointments/Employment

Agility Robotics

Software Engineer III, Robotics - Supervisor: Daniel Piedrahita

Salem, OR

Apr 2024– Present

Software Engineer II, Motion Planning - Supervisor: Daniel Piedrahita

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 policy to be deployed to 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

Graduate Research Fellow - Supervisors: Jonathan Hurst and Ross Hatton

Corvallis, OR

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

Undergraduate Research Assistant - Supervisors: Glenn Green and Dave Zopf

Ann Arbor, MI

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

Undergraduate Research Assistant - Supervisor: C. David Remy

Ann Arbor, MI

Jan 2014–May 2016

- Designed, programmed, and tuned a virtual model control walking controller in simulation and hardware for a series elastic biped
- 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

Engineering Intern - Supervisors: J M Hunnell and Alvaro Vallejo

Saint Joseph, MI

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

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 Honors

2022: Guinness World Record Fastest 100 m 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 (NSF)

2017: Provost Distinguished Fellowship

2016: Best Undergraduate Research Presentation in Dynamics and Controls

National

Oregon State University

University of Michigan

Service and Teaching

Teaching Experience.....

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| ○ 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.....

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| ○ 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