Kevin Green | Roboticist

Graf Hall – 1680 SW Monroe Ave – Corvallis, OR 97331

✉ greenkev@oregonstate.edu

PhD student at Oregon State University studying the design and control of legged robots.

Education

Oregon State University — **Corvallis, OR**
PhD in Robotics - In Progress, Expected 2022 — *Sep. 2017-present*
Advisors: Jonathan Hurst and Ross 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

Professional Appointments/Employment

Oregon State University: Dynamic Robotics Lab — **Corvallis, OR**
Graduate Research Fellow - Supervisors: Jonathan Hurst and Ross Hatton — *Sep. 2017–present*

- Develop a bipedal control hierarchy that utilize machine learning and online optimization
- Develop physics first RL and machine learning approaches for agile legged locomotion
- Implement 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 - Supervisors: Glenn Green and Dave Zopf — *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 - Supervisors: C. David Remy — *Jan. 2014–May 2016*

- Designed, programmed, and tuned a walking controller in hardware and simulation 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 — **Saint Joseph, MI**
Engineering Intern - Supervisors J M Hunnell and Alvaro Vallejo — *Jun.–Aug. 2013, May-Aug. 2014*

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

Awards, Fellowships and Honors

2017: Graduate Research Fellowship, National Science Foundation (NSF) — *National*
2017: Provost Distinguished Fellowship — *Oregon State University*

Publications

Book Chapters

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. [Online]. Available: https://doi.org/10.1007/978-3-642-41610-1_120-1

Refereed Journal 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. [Online]. Available: https://doi.org/10.1109/LRA.2021.3066833

Vivian C. Nanagas, Keerthi R. Karamched, Allison Powell, **Kevin Green**, Alan P. Baptist, and Glenn E. Green, "Development of a 3-dimensional practice nasolaryngoscopy model," *Journal of Allergy and Clinical Immunology*, vol. 141, no. 2, Supplement, p. AB164, 2018.

Chelsea L. Reighard, **Kevin Green**, Deborah M. Rooney, and David A. Zopf, "Development of a Novel, Low-Cost, High-fidelity Cleft Lip Repair Surgical Simulator Using Computer-Aided Design and 3-Dimensional PrintingDevelopment of a Cleft Lip Repair Surgical Simulator Using Computer-Aided Design and 3-D PrintingLetters," *JAMA Facial Plastic Surgery*, vol. 21, no. 1, pp. 77–79, 01 2019. [Online]. Available: https://doi.org/10.1001/jamafacial.2018.1237

Kevin J Kovatch, Allison R Powell, **Green, Kevin**, Chelsea L Reighard, Glenn E Green, Virginia T Gauger, Deborah M Rooney, and David A Zopf, "Development and multidisciplinary preliminary validation of a 3-dimensional-printed pediatric airway model for emergency airway front-of-neck access procedures." *Anesthesia and analgesia*, 2018.

Chelsea L. Reighard, **Kevin Green**, Allison R. Powell, Deborah M. Rooney, and David A. Zopf, "Development of a high fidelity subglottic stenosis simulator for laryngotracheal reconstruction rehearsal using 3d printing," *International Journal of Pediatric Otorhinolaryngology*, vol. 124, pp. 134 – 138, 2019. [Online]. Available: http://www.sciencedirect.com/science/article/pii/S0165587619302484

Peer-Reviewed Conference Publications

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. [Online]. Available: https://arxiv.org/abs/2105.08328

Helei Duan, Jeremy Dao, **Kevin Green**, Taylor Apgar, Alan Fern, and Jonathan Hurst, "Learning task space actions for bipedal locomotion," in *2021 IEEE International Conference on Robotics and Automation (ICRA)* **Finalist for Best Paper in Cognitive Robotics**, 2021.

Kevin Green, Ross L. Hatton, and Jonathan Hurst, "Planning for the Unexpected: Explicitly Optimizing Motions for Ground Uncertainty in Running," 2020. [Online]. Available: https://arxiv.org/abs/2001.10629

Mike Hector, **Kevin Green**, Burak Sencer, and Jonathan Hurst, "Ankle torque during mid-stance does not lower energy requirements of steady gaits," in *2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019, pp. 5491–5497.

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. [Online]. Available: http://www.roboticsproceedings.org/rss14/p54.pdf

Kevin Green, Nils Smit-Anseeuw, Rodney Gleason, and C. David Remy, "Design and control of a recovery system for legged robots," in *2016 IEEE International Conference on Advanced Intelligent Mechatronics (AIM)*, July 2016, pp. 958–963.

Patents

Alvaro Vallejo Noriega, Harsh R. Mondkar, and **Green, Kevin**, "Method of using high velocity water to remove puddling in a dishwasher," U.S. Patent 9 895 043, February, 2018.

——, "Method of using high velocity water to remove puddling in a dishwasher," U.S. Patent 9 986 883, June, 2018.

——, "Dishwasher with high-velocity sprayer," U.S. Patent 20 180 249 881, September, 2018.

David Zopf, **Green, Kevin**, and Kyle Vankoevering, "Ear splint to correct congenital ear deformities," International Patent WO2 018 053 219A1, March, 2018.

Presentations

Conference Abstracts and Presentations

Jeremy Dao, **Kevin Green**, Helei Duan, Jonah Siekmann, Yesh Godse, Alan Fern, and Jonathan Hurst, "Challenges of Learned High-Speed Locomotion over Five Kilometers in the Real World," in *ICRA 2021: 5th Workshop on Legged Robots: Towards Real-World Deployment of Legged Robots,* **Winner Best Extended Abstract**, 2021.

Jeremy Dao, Helei Duan, **Green, Kevin**, Jonathan Hurst, and Alan Fern, "Learning to walk without dynamics randomization," in *RSS 2020: 2nd Workshop on Closing the Reality Gap in Sim2Real Transfer for Robotics*.

Green, Kevin, Yesh Godse, Jeremy Dao, Ross L Hatton, Alan Fern, and Jonathan Hurst, "Leveraging spring mass locomotion to guide learned walking controllers," in *Dynamic Walking Meeting*, May 2020. [Online]. Available: https://www.seas.upenn.edu/~posa/DynamicWalking2020/723-1093-1-RV.pdf

Helei Duan, Jeremy Dao, **Green, Kevin**, Alan Fern, and Jonathan Hurst, "Learning bipedal locomotion in task space," in *Dynamic Walking Meeting*, May 2020. [Online]. Available: https://www.seas.upenn.edu/~posa/DynamicWalking2020/682-1014-1-RV.pdf

Kevin Green, Ross L. Hatton, and Jonathan Hurst, "Control of compliant robotic legs for modal behavior," in *Dynamic Walking Meeting*, 2019, oral Presentation.

Mike Hector, **Kevin Green**, Burak Sencer, and Jonathan Hurst, "The energetic benefit of midstance ankle torque in dynamic gaits," in *Dynamic Walking Meeting*, 2019, oral Presentation.

Green, Kevin, Taylor Apgar, and Jonathan Hurst, "Footstep planning and operational space control on cassie," in *Dynamic Walking Meeting*, 2018, oral Presentation. [Online]. Available: https://youtu.be/Cirjk-hXFH4

Ahmed S Ali, David Zopf, **Green, Kevin**, Glenn Green, and Chelsea Reighard, "71. computer-aided design and 3d printing to produce a model for simulation of cleft lip repair," vol. 54, no. 3. The Cleft Palate-Craniofacial Journal, 2017, p. e26.

Teaching Experience

Instructor of Record

1. Oregon State University. ENGR 212 Dynamics

Teaching Assistant

1. Oregon State University. ME 317 Intermediate Dynamics
2. Oregon State University. ROB 542 Actuator Dynamics
3. Oregon State University. ROB 521 Research Robotics

Service

Mentoring

1. Yesh Godse, Oregon State Undergraduate   Fall 2019 - Present

           2020 Goldwater Scholar, Recruited to Agility Robotics
2. Ryan Batke, Oregon State Robotics MS Student   Fall 2020 - Present
       Recruited to IHMC internship
3. Jonah Siekmann, Oregon State Undergraduate and Master's   Winter 2018 - Present
       Recruited to Agility Robotics
4. Elizabeth Childs, REU Student   Summer 2018
5. Andrew Sanders, Oregon State Undergraduate   Winter 2018 - Summer 2018
       Recruited to Garmin
6. Grace Stridick, University of Michigan UROP Student   2016-2017

Peer Reviewer

1. IEEE Robotics and Automation Letters (RA-L)
2. IEEE Transactions on Robotics (T-RO)
3. International Journal of Robotics Research (IJRR)
4. Mechanism and Machine Theory
5. IEEE International Conference on Robotics and Automation (ICRA)
6. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Outreach

1. FIRST Tech Challenge Volunteer for Oregon State University Event

Media Coverage

1. "Agility Robotics' Cassie Is Now Astonishingly Good at Stairs" IEEE Spectrum. May 20, 2021. Web
2. "'Blind' robot learns to navigate a flight of stairs for the first time by feeling its way" Daily Mail. May 19, 2021. Web
3. "after walking through fire, blind bipedal robot 'cassie' learns to climb stairs" designboom. May 19, 2021. Web
4. "Watch a 'blind' robot successfully navigate stairs" Engadget. May 19, 2021. Web
5. "Oregon State among top robotics programs in country, according to report" Fox 12: KPTV. September 18, 2018. Television and Web
6. "Scientists At Oregon State Are Building Robots That Can Walk Like Us" Oregon Public Broadcasting. July 17, 2018. Web

Professional Organizations

Professional Societies

1. IEEE Student Member
2. Tau Beta Pi Engineering Honor Society, Fall 2014
3. Pi Tau Sigma Mechanical Engineering Honor Society, Fall 2015
4. Phi Kappa Phi Mechanical Engineering Honor Society, Winter 2015

Citizenship: United States of America