Jason White | Roboticist

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Education

Florida State University

Ph.D. Mechanical Engineering - Legged Robot Control *2020 - 2023*
M.S. Mechanical Engineering - Robotics, Dynamics, & Controls *2018 - 2020*
Advisor: Christian Hubicki Ph.D.

Virginia Polytechnic Institute and State University

B.S. Civil Engineering - Structural Focus *2008 - 2012*

Employment

Ghost Robotics *2024 - present*

Behavior and Controls Engineer

- Quadrupedal control: optimal control algorithms, blind locomotion reflexes, manipulation behaviors, and dynamic model development
- Code structure cleanup, refactoring, and optimization
- Actuator design for next generation quadruped

Florida State University: Optimal Robotics Lab *2018 - 2023*

Graduate Research Assistant – Supervisors: Christian Hubicki & Johnathan Clark

- Obstacle avoidance algorithm: for quadrotor & bipedal avoidance of fast-moving obstacles *[hardware, ~1kHz]* https://www.youtube.com/watch?v=cKKLuRdrqcQ
- Bipedal balancing controller: for dynamic terrain tested on Cassie *[hardware, >2kHz]* https://www.youtube.com/watch?v=q10Wg61H4UQ
- Real-time reactive planning and control for monopods (with flexible contact sequencing) *[simulated, ~500Hz]* https://www.youtube.com/watch?v=EquyU9cm-SM
- Quadrupedal stepping controller: using optimal control techniques (preliminary results) *[simulated, ~500Hz]* www.linkedin.com/feed/update/urn:li:activity:7122585426162249730/

Army Research Laboratory (Fellowship) *2021 - 2022*

Graduate Research Fellow – Supervisor: Jason Pusey

- Monopod planner through viscous media experimentation and controller development *[hardware, ~0.5Hz]*
- Iterative modeling and design of revolute-revolute leg

Awards, Fellowships, and Honors

2022: Best Locomotion Paper, IEEE International Conference on Robotics and Automation *IEEE*
2021: Research Fellowship Recipient, DEVCOM Army Research Laboratory *National*

Publications

Jason White and Christian Hubicki, "Real-time Adversarial Obstacle Avoidance." in *IEEE Robotics and Automation Letters (RAL)*. [Pending Submission].

Jason White and Christian Hubicki, "Through-contact Monopod Motion Generation via MPC: Convex Formulation and Locomotion Analysis." [Pending Submission].

Tianze Wang, **Jason White**, and Christian Hubicki, "Real-time Dynamic Bipedal Avoidance," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* IEEE.

Jason White, David Jay, Tianze Wang, and Christian Hubicki, “Avoiding Dynamic Obstacles with Real-time Motion Planning using Quadratic Programming for Varied Locomotion Modes,” in *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* (pp. 13626-13633) IEEE.

Jason White, Max Austin, Jonathan Clark, Christian Hubicki, and Jason Pusey. “Online Gait Optimization for Running in Resistive Media,” in *2022 7th International Conference on Robotics and Automation Engineering (ICRAE)* (pp. 282-286). IEEE.

Adwait Mane, Dylan Swart, **Jason White**, and Christian Hubicki. “Trajectory Optimization Formulation with Smooth Analytical Derivatives for Track-leg and Wheel-leg Ground Robots.” in *2022 International Conference on Robotics and Automation (ICRA)* (pp. 5762-5768). IEEE.

Max Austin, John Nicholson, **Jason White**, Sean Gart, Ashley Chase, Jason Pusey, Christian Hubicki, Jonathan Clark, “Optimizing Dynamic Legged Locomotion in Mixed, Resistive Media,” in *2022 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)* (pp. 1482-1488). IEEE.

Jason White, Dylan Swart, and Christian Hubicki, “Force-based Control of Bipedal Balancing on Dynamic Terrain with the" Tallahassee Cassie" Robotic Platform,” in *2020 IEEE International Conference on Robotics and Automation (ICRA)* (pp. 6618-6624). IEEE.

Presentations

Jason White, “Real-time Planning & Control for Robots in Dynamic Environments,” in FAMU/FSU College of Engineering Graduate Seminar 2023. Oral presentation

Jason White, David Jay, Tianze Wang, and Christian Hubicki, “Avoiding Dynamic Obstacles with Real-time Motion Planning using Quadratic Programming for Varied Locomotion Modes,” in IROS 2022: Constrained Motion Planning. Available: https://www.youtube.com/watch?v=pQYr36-TvNo

Jason White, Max Austin, Jonathan Clark, Christian Hubicki, and Jason Pusey. “Online Gait Optimization for Running in Resistive Media,” in ICRAE 2022: Mechanical System Control and Path Planning. Oral presentation.

Jason White, Dylan Swart, and Christian Hubicki, “Force-based Control of Bipedal Balancing on Dynamic Terrain with the" Tallahassee Cassie" Robotic Platform,” in ICRA 2020: Bipedal Locomotion. Available: https://www.youtube.com/watch?v=q10Wg61H4UQ&t=6s

Jason White, Christian Hubicki, “Toward Reduced-Order Modeling Approaches for Rapidly Reactive Locomotion," in Dynamic Walking 2021: Poster Session. Available: https://www.researchgate.net/publication/374842497_Dynamic_Walking_2021

Technical Skills

Software: C++, Python, MATLAB, Simulink, Mujoco, AutoCAD, Solidworks, Github, Gitlab, Linux
Hardware: Cassie (Agility Robotics Biped), Crazyflie (Drone), Minitaur (Ghost Robotics monopod), Vision 60 (Ghost Robotics), ET-Quad (Custom Quadruped)
Control Methods: Operational Space Control, Inverse Dynamics, Joint Space Control, PD/PID Control, Force Control.
Planning Methods: Model Predictive Control, Direct Collocation, RRT*, A*.
Optimization: LPs, QPs, NLPs, Newton Raphson, Graph Search Methods
Dynamic Modeling: Newton Euler, Euler Lagrange