RIANNA JITOSHO

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EDUCATION

Stanford University | Stanford, CA   2019-2024
- Ph.D. Candidate in Mechanical Engineering, M.S. in Mechanical Engineering (2019-2021), GPA: 4.0/4.0
- Advisors: Allison Okamura and Karen Liu, Collaborator: Zachary Manchester (Carnegie Mellon University)
- Relevant Coursework: Machine Learning, Robot Autonomy, Optimal and Learning-Based Control

Massachusetts Institute of Technology | Cambridge, MA   2015-2019
- Bachelor of Science in Mechanical Engineering, GPA: 4.9/5.0
- Relevant Coursework: Dynamics and Control I & II, Feedback Systems, Design of Electromechanical Robotic Systems

EXPERIENCE

CHARM Lab at Stanford University | Stanford, CA
Graduate Student Researcher
<u>Modeling, System Identification, and Control for Soft Robots</u>   Mar 2020 - present
- Created a high-speed dynamics simulator for soft growing "vine" robots to be used in motion planning algorithms
- Prototyped a lightweight version of the vine robot for use on mobile platforms such as aerial vehicles
- Developed a system identification method for approximating soft robot dynamics with multi-link rigid body models
- Exploring trajectory optimization and reinforcement learning for a mobile-base vine robot to leverage parallel actuation (base motion and vine bending) for improving dynamic performance; validating control methods on physical hardware

<u>Medical Robotics</u>   Sep - Dec 2019
- Developed a practice environment in VR for surgeons to improve their suturing technique
- Utilized C++, ROS, and QT for implementation on Intuitive Surgical's Da Vinci robotic-assisted surgical system

Honda Research Institute | San Jose, CA
Robotics Intern   Jun - Dec 2021
- Developed planning and control methods for in-hand manipulation that exploits sliding contact
- Implemented algorithms in C++ and ran simulations with ROS to verify functionality

NASA Jet Propulsion Laboratory | Pasadena, CA
Robotics R&TD (Research & Technology Development) Intern   Jun - Aug 2019
- Designed hardware for an autonomous hybrid aerial-ground vehicle to compete in the DARPA Subterranean Challenge
- Led sensor integration, electronics packaging, and wire harnessing of the aerial-ground vehicle
- Experimentally characterized propeller thrust variation to verify first order dynamics and inform vehicle controls

DART Lab at Georgia Institute of Technology | Atlanta, GA
NSF Robotics Research Fellow   May - Aug 2018
- Designed and manufactured a bistable, reflexive, lightweight gripper featuring a high force density and rapid activation
- Led project from concept phase to working prototype which carried 15-28 times its weight and actuated in 0.12 s

Responsive Environments at MIT Media Lab | Cambridge, MA
Undergraduate Researcher   Mar 2018 - Jun 2019
- Demonstrated locomotion on a proof-of-concept prototype of a pneumatic, bio-inspired epidermal soft robot
- Designed a silicone actuator for bending in 3 directions, developed fabrication methods utilizing multi-part molds
- Implemented electronic controls for the pneumatics and programmed multiple modes of locomotion

MENTORING AND OUTREACH

Research Mentor – CHARM Lab | Stanford, CA   Jan 2022 - present
- Mentoring undergraduate students for research projects on soft and flexible robotics
- Mentees: Max Alquist, Ryan Nguyen, Sofia Simón-Trench

Educational Outreach – CHARM Lab | Stanford, CA   Mar 2020 - present
  o Engage with students ranging from elementary school to community college
  o Provide demonstrations of robotics research and lead discussions on areas for future work

Solar Electric Vehicle Team Outreach – MIT | Cambridge, MA   Sep 2015 - Aug 2018
  o Hosted lab tours for students from local elementary and high schools or visiting students in MIT summer programs

TEACHING

Stanford University | Stanford, CA
Course Assistant for Dynamic Systems, Vibrations and Control   Sep 2022 - present
  o Facilitated discussion during class and office hours, designed homework problems, graded assignments and exams

Experimental Study Group (ESG) | Cambridge, MA
Teaching Assistant for Multivariable Calculus   Aug 2016 - Jun 2019
  o Led recitation sections and exam reviews, hosted office hours, graded assignments and exams
  o Completed a semester-long course on strategies for effective teaching

China Educational Technology Initiative (CETI) | Xi'an / Guangzhou / Fuzhou, China
Instructor   Jun 2016 - Aug 2016
  o Constructed and presented STEM curriculum that provided a more interactive learning experience
  o Facilitated discussion and activities for cross-cultural exchange

PUBLICATIONS

[1] **R. Jitosho***, S. Simón-Trench*, A. Okamura, B. Do, "Passive Shape Locking for Multi-Bend Growing Inflated Beam Robots," 2023 International Conference on Soft Robotics (RoboSoft), Accepted.
[2] **R. Jitosho**, N. Agharese, A. Okamura and Z. Manchester, "A Dynamics Simulator for Soft Growing Robots," 2021 International Conference on Robotics and Automation (ICRA), Xi'an, China, 2021.
[3] B. Jackson et al., "ALTRO-C: A Fast Solver for Conic Model-Predictive Control," 2021 International Conference on Robotics and Automation (ICRA), Xi'an, China, 2021.
[4] A. Dementyev, **R. Jitosho** and J. A. Paradiso, "Mechanical Imaging of Soft Tissues with Miniature Climbing Robots," in IEEE Transactions on Biomedical Engineering (TBME), 2021.
[5] A. Kalantari et al., "Drivocopter: A concept Hybrid Aerial/Ground vehicle for Long-Endurance Mobility," 2020 IEEE Aerospace Conference, Big Sky, MT, USA, 2020, pp. 1-10.
[6] S. Backus, J. Izraelevitz, J. Quan, **R. Jitosho**, E. Slavick and A. Kalantari, "Design and Testing of an Ultra-Light Weight Perching System for Sloped or Vertical Rough Surfaces on Mars," 2020 IEEE Aerospace Conference, Big Sky, MT, USA, 2020, pp. 1-12.
[7] **R. Jitosho**, K. Choi, A. Foris and A. Mazumdar, "Exploiting Bistability for High Force Density Reflexive Gripping," 2019 International Conference on Robotics and Automation (ICRA), Montreal, QC, Canada, 2019, pp. 1241-1247.

PRESENTATIONS

Poster Presentation | Stanford Wearable Electronics Initiative Symposium   2023
Invited Workshop Speaker | International Conference on Soft Robotics (RoboSoft)   2022
Paper Presentation | International Conference on Robotics and Automation (ICRA)   2021
Poster Presentation | International Conference on Robotics and Automation (ICRA)   2019

AWARDS

National Science Foundation Graduate Research Fellow   2019-2022
Peter and Sharon Fiekowsky Award for Excellence in Teaching   2019
MIT Community Service Award   2014