

CONTACT INFORMATION	sdivi@andrew.cmu.edu https://sathvikdivi.github.io/	669.234.2974
RESEARCH INTERESTS	bio-inspired robotics, insect-scale robotics, microrobots, actuation and sensing, design and control of novel mechanisms, fabrication, systems integration	
EDUCATION	Carnegie Mellon University Ph.D., Mechanical Engineering, Dissertation title: <i>Role of latches in latch-mediated spring actuation systems for high-acceleration movements in small-scale robots</i> Advisor: Prof. Sarah Bergbreiter	Pittsburgh, PA Aug 2022 (Expected)
	NC State University M.S., Mechanical Engineering,	Raleigh, NC Dec 2017
	Birla Institute of Technology & Science - Pilani, B.E.(Hons), Mechanical Engineering,	India June 2014
SKILLS	Programming Languages MATLAB, Python, C, C++ Design/Analysis Tools Simulink, Solidworks, Ansys APDL, Eagle Rapid Prototyping Methods 3D Printing (FDM, SLA, DLP, PolyJet), Laser Cutting	
RESEARCH EXPERIENCE	Research Assistant Microrobotics Lab, Carnegie Mellon University	Aug 2018 to Current Pittsburgh, PA
	<ul style="list-style-type: none"> Modeled the dynamics of latch-mediated spring actuation (LaMSA) systems to investigate the role of latches in high-acceleration movements in insects & robots Designed & fabricated small bio-inspired jumping robot prototypes, and validated the role of latches as a control tool for feedforward control in impulsive systems Designed & built a programmable virtual substrate using impedance control of a direct-drive actuator for mimicking a variety of environments to study the tuning relationship between LaMSA jumping robots and their environment Modeled & experimentally validated the tuning relationships between design & control aspects of LaMSA-based jumping robots and their environment 	
	Research Assistant Microrobotics Lab, University of Maryland	Jan to July 2018 College Park, MD
	<ul style="list-style-type: none"> Fabricated EPFL-inspired 7g LaMSA-based jumping robots with tunable latches to control jump performance 	
	Research Assistant Engineering Mechanics & Space Systems Lab, NC State University	Aug 2016 to June 2017 Raleigh, NC
	<ul style="list-style-type: none"> Modeled the dynamics and control of a mobile underwater turbine system for harvesting marine hydrokinetic energy 	
JOURNAL PUBLICATIONS	J1 Divi, S. , Reynaga, C.M., Azizi E., and Bergbreiter, S., “Adapting small jumping robots to compliant environments” [In Prep, Science Robotics] J2 Divi, S. , Foong, H.M., St. Pierre, R., and Bergbreiter, S., “Latch-based control of jump performance in small-scale jumping robots with fixed spring compression” [In Prep, Bioinspiration & Biomimetics] J3 Olberding, J.P., Hyun, N.P., De, A., Divi, S. , Liang, X., Thomas, E., St. Pierre, R., Steinhardt, E., Jorge, J., Longo S.J., Cox, S., Mendoza, E., Sutton, G.P., Azizi, E., Crosby, A.J., Bergbreiter, S., Wood., R.J., and Patek, S.N., “Spring	

- and latch dynamics act as control pathways in ultrafast systems” [**Submitted to Science Advances**]
- J4 **Divi, S.**, Ma, X., Ilton, M., St. Pierre, R., Eslami, B., Patek, S.N., and Bergbreiter, S., “Latch-based control of energy output in spring actuated systems”, *Journal of the Royal Society Interface* vol. 17, July 2020
- J5 Tandon, S., **Divi, S.**, Muglia, M., Vermillion, C., Mazzoleni, A., “Modeling and dynamics analysis of a mobile underwater turbine system for harvesting marine hydrokinetic energy”, *Ocean Engineering* vol. 187, July 2019
- CONFERENCE PRESENTATIONS AND PROCEEDINGS
- C1 Krishnan, T., **Divi, S.**, St. Pierre, R., Bergbreiter, S., and Ilton, M., “Performance trade-offs in a latch-mediated spring actuated robotic jumper”, *Bulletin of the American Physical Society*, Chicago, IL, March 14-18 2022
- C2 **Divi, S.**, Ma, X., Ilton, M., and Bergbreiter, S., “Tuning impulsive mechanisms to their environment”, *Bulletin of the American Physical Society*, Boston, MA, March 4-8 2019
- C3 Ilton, M., Cook, A., Heller, N., Patek, S., Crosby, A., Bergbreiter, S., Azizi, E., Sutton, G., Longo, S., **Divi, S.**, Reynaga, C., Olberding, J., St. Pierre, R., Cox, S., “Modeling the physical constraints of latch mediated, spring actuated systems”, *Bulletin of the American Physical Society*, Boston, MA, March 4-8 2019
- WORKSHOP TALKS
- W1 **Divi, S.** and Bergbreiter, S., “Power modulation of ultrafast movements through latches”, *IEEE International Conference on Robotics and Automation (ICRA) Workshop on Energy Storage and Delivery in Robotic Systems*, Philadelphia, PA, May 27, 2022 [**To be delivered**]
- W2 **Divi, S.** and St. Pierre, R., “Practical approaches to studying latches” *Society of Integrative and Comparative Biology Workshop on Playing with power: mechanisms of energy flow in organismal movement*, Tampa, FL, January 3, 2019
- TEACHING EXPERIENCE
- Teaching Assistant** Aug to Dec 2019
24-452 - Mechanical Systems Experimentation
Carnegie Mellon University
- Teaching Assistant** Jan to May 2018
ENME350 - Electronics and Instrumentation I
University of Maryland
- Teaching Assistant** Aug 2016 to May 2017
MAE 405 - Dynamics and Control Laboratory
NC State University
- AWARDS
- Milton Shaw Award for best poster (Robotics) at the 2019 Graduate Research Symposium (Dept of Mechanical Engineering, Carnegie Mellon University), March 2019
- Finalist at CMU’s 2022 3MT competition
- LEADERSHIP
- Organizer - Symposium on *Fast Movements: Nature, Robotics and Materials*, Duke University, Durham, NC, July 19-21 2022
- Organizer - Workshop on *Impulsive systems: Principles of rapid energy release and applications to unique robot behaviors*, at IEEE International Conference on Robotics and Automation, Philadelphia PA, May 23, 2022

Workshop leader - *Society of Integrative and Comparative Biology Workshop on Playing with Power: mechanisms of energy flow in organismal movement*, Tampa, FL, Jan 3, 2019

Vice president - Indian Graduate Student Association (MAITRI) at NC State University, Dec 2015-Dec 2016