Kaushik Jayaram, Ph.D.

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http:/kaushikjayaram.com/ | Google Scholar | Media Channel

Employment History

- 2020 – · · · · **Assistant Professor.** Mechanical Engineering, University of Colorado Boulder.
- 2019 – 2019 **Visiting Assistant Professor.** Mechanical Engineering, University of Colorado Boulder.
- 2018 – 2019 **Research Associate.** John A. Paulson School of Engineering and Applied Sciences, Harvard University.
  (Prof. Rob Wood's Microrobotics Lab)
- 2015 – 2018 **Postdoctoral Scholar.** Wyss Institute for Biologically Inspired Engineering, Harvard University.
  (Prof. Rob Wood's Microrobotics Lab)
- 2009 – 2015 **Graduate Research Assistant.** University of California Berkeley.
  (Prof. Robert Full's PolyPEDAL Lab)
- 2007 – 2007 **Undergraduate Research Fellow.** Ecole Polytechnique Federale du Laussane.
  (Prof. Dario Floreano's Laboratory for Intelligent Systems)
- 2006 – 2006 **Undergraduate Research Fellow.** University of Bielefeld.
  (Prof. Holk Cruse's Bio Cybernetics Group)

Education

- 2009 – 2015 **Ph.D., University of California Berkeley** in Integrative Biology.
  Thesis title: *Robustness of biological and bioinspired exoskeletons.*
  Advisor: *Prof. Robert J. Full*
- 2004 – 2009 **M.Tech., Indian Institute of Technology Bombay** in Computer Integrated Manufacturing.
  Thesis title: *Development of low-cost, vision-based microassembly system.*
  Advisor: *Prof. Suhas S. Joshi*
- **B.Tech., Indian Institute of Technology Bombay** in Mechanical Engineering.

Honors and Awards

- 2019 Burroughs Wellcome Fund's Career Award at Scientific Interface, *(finalist)*
- 2018 IOP Outstanding Reviewer Award
- 2017 IROS Best Paper Award, Finalist 2017
- 2016 Mimi Koehl and Stephen Wainwright Best Paper Award (SICB)
- 2014 Outstanding Graduate Student Instructor
- 2012 – 2015 David and Caroline Miller Fellowship
- 2009 – 2014 Travel Awards : Wiley Foundation (13-14), Charlotte Magnum (10-12), Hansen Fund (09-14)
- 2009 – 2011 UC Berkeley Graduate Fellowship
- 2005 IIT Bombay Heritage Scholarship - *One of 20 selected from over 500 students*

Honors and Awards (continued)

- 2004 — International Chemistry Olympiad Camp 2004 - *Amongst the top 25 in the country selected*
- 2002 – 2004 — State Mathematics Olympiad - *Ranked in the top 10 for 3 successive years*
- 2002 – 2009 — National Talent Search Scholarship 2002-09 - *One of 750 awardees countrywide (State Rank 3)*

Research Publications

Google Scholar

Journal Articles

1. **Jayaram, K.**, Doshi, N., Castellanos, S., Kuindersma, S., & Wood, R. J. (2019). Effective locomotion at multiple stride frequencies using proprioceptive feedback on a legged microrobot. *arXiv preprint arXiv:1901.08715*.
2. de Rivaz, S. D., Goldberg, B., Doshi, N., **Jayaram, K.**, Zhou, J., & Wood, R. J. (2018). Inverted and vertical climbing of a quadrupedal microrobot using electroadhesion. *Science Robotics*, *3*(25), eaau3038. (**Altmetric Score 172**)
3. **Jayaram, K.**, Jafferis, N. T., Doshi, N., Goldberg, B., & Wood, R. J. (2018). Concomitant sensing and actuation for piezoelectric microrobots. *Smart Materials and Structures*, *27*(6), 065028.
4. **Jayaram, K.**, Mongeau, J.-M., Mohapatra, A., Birkmeyer, P., Fearing, R. S., & Full, R. J. (2018). Transition by head-on collision: mechanically mediated manoeuvres in cockroaches and small robots. *Journal of The Royal Society Interface*, *15*(139), 20170664. (**Altmetric Score 337**)
5. Christodouleas, D. C., Simeone, F. C., Tayi, A., Targ, S., Weaver, J. C., **Jayaram, K.**, … Whitesides, G. M. (2017). Fabrication of paper-templated structures of noble metals. *Advanced Materials Technologies*, *2*(2), 1600229.
6. Goldberg, B., Doshi, N., **Jayaram, K.**, & Wood, R. J. (2017). Gait studies for a quadrupedal microrobot reveal contrasting running templates in two frequency regimes. *Bioinspiration & biomimetics*, *12*(4), 046005.
7. **Jayaram, K.** & Full, R. J. (2016). Cockroaches traverse crevices, crawl rapidly in confined spaces, and inspire a soft, legged robot. *Proceedings of the National Academy of Sciences*, *113*(8), E950–E957. (**Altmetric Score 1118, Annual Ranking # 103**)
8. **Jayaram, K.** & Joshi, S. S. (2016). Design and development of a vision-based micro-assembly system. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, *230*(6), 1164–1168.
9. Mongeau, J.-M., Demir, A., Dallmann, C. J., **Jayaram, K.**, Cowan, N. J., & Full, R. J. (2014). Mechanical processing via passive dynamic properties of the cockroach antenna can facilitate control during rapid running. *Journal of Experimental Biology*, *217*(18), 3333–3345.
10. **Jayaram, K.** & Joshi, S. S. (2009). Development of a flexure-based, force-sensing microgripper for micro-object manipulation. *Journal of Micromechanics and Microengineering*, *20*(1), 015001.

Conference Proceedings

1. Doshi, N., **Jayaram, K.**, Goldberg, B., Manchester, Z., Wood, R., & Kuindersma, S. (2018). Contact-implicit optimization of locomotion trajectories for a quadrupedal microrobot. In *Robotics: science and systems*.

2. Doshi, N., **Jayaram**, **K.**, Goldberg, B., & Wood, R. J. (2017). Phase control for a legged microrobot operating at resonance. In *2017 ieee international conference on robotics and automation (icra)* (pp. 5969–5975). IEEE.

3. Goldberg, B., Doshi, N., **Jayaram**, **K.**, Koh, J.-S., & Wood, R. J. (2017). A high speed motion capture method and performance metrics for studying gaits on an insect-scale legged robot. In *Ieee/rsj international conference on intelligent robots and systems (iros) 2017*. (**Finalist, Best Conference Paper**)

4. **Jayaram**, **K.** & Joshi, S. S. (2012). Development of a low-cost vision-based micro-assembly system. International Conference on Mechatronics and Manufacturing.

Abstracts

1. **Jayaram**, **K.**, Doshi, N., & Wood, R. (2019). Gait recovery using proprioceptive feedback in hamr, a biologically-inspired robotic platform. Society of Integrative and Comparative Biology Annual Meeting.

2. **Jayaram**, **K.**, Salcedo, M., Weaver, J., Bartlett, N., Mahadevan, L., & Wood, R. (2018). Fabrication of insect wings ranging from millimeters to meters. Society of Integrative and Comparative Biology Annual Meeting.

3. Doshi, N., Goldberg, B., **Jayaram**, **K.**, & Wood, R. (2017). Task driven optimal leg trajectories in insect-scale legged microrobots. Americal Physical Society March Meeting.

4. **Jayaram**, **K.**, Goldberg, B., Doshi, N., & Wood, R. (2017). Towards rapid running at resonance using hamr, a biologically-inspired robotic platform. Society of Integrative and Comparative Biology Annual Meeting.

5. **Jayaram**, **K.** & Full, R. (2016). Cockroaches squeezing through crevices. Society of Integrative and Comparative Biology Annual Meeting. (**Winner, Best Conference Presentation**)

6. Li, C., Tian, R., Porter, W., Hammond, Z., Strachan-Olson, D., Kooker, A., … Fearing, R. (2016). Cockroach-inspired self-righting robots. Society of Integrative and Comparative Biology Annual Meeting.

7. **Jayaram**, **K.** & Full, R. (2015). Body size limit predictions for mechanically mediated maneuvers. Society of Integrative and Comparative Biology Annual Meeting. (**Finalist, Best Conference Presentation**)

8. **Jayaram**, **K.**, Goldman, D., & Full, R. (2014). Effect of friction on cockroaches running in confined spaces. Society of Integrative and Comparative Biology Annual Meeting.

9. Dallmann, C., Mongeau, J.-M., **Jayaram**, **K.**, Mahavadi, A., & Full, R. (2013). Dynamic response of antenna flagellum in the american cockroach. Society of Integrative and Comparative Biology Annual Meeting.

10. **Jayaram**, **K.**, Merritt, C., & Full, R. (2012). Robust climbing in cockroaches results from fault tolerant design using leg spines. Society of Integrative and Comparative Biology Annual Meeting.

11. Demir, A., Samson, E., Mongeau, J.-M., **Jayaram**, **K.**, Full, R., & Cowan, N. (2011). A tunable, multisegmented robotic antenna for identifying and testing biomechanical design principles. Society of Integrative and Comparative Biology Annual Meeting.

12. Full, R., **Jayaram**, **K.**, Mongeau, J.-M., Birkmeyer, P., Hoover, A., & Fearing, R. (2011). Role of robustness in running: bio-and bio-inspired exoskeletons. Society of Integrative and Comparative Biology Annual Meeting.

13 **Jayaram**, **K.**, Merritt, C., Cherian, A., & Full, R. (2011). Running without feet: the role of tarsi during high-speed horizontal locomotion in cockroaches. Society of Integrative and Comparative Biology Annual Meeting.

14 Mongeau, J.-M., **Jayaram**, **K.**, Demir, A., Sampson, E., Cowan, N., & Rull, R. (2011). Biomechanics of tactile sensor for wall following and spatial mapping. Society of Integrative and Comparative Biology Annual Meeting.

15 **Jayaram**, **K.**, Mongeau, J.-M., McRae, B., & Full, R. (2010). High-speed horizontal to vertical transitions inrunning cockroaches reveals a principle of robustness. Society of Integrative and Comparative Biology Annual Meeting. (**Finalist, Best Conference Presentation**)

16 Mongeau, J.-M., **Jayaram**, **K.**, Lee, J., Full, R., & Cowan, N. (2010). Mechanical feedback of antenna-substrate interaction simplifies cockroach antennal navigation. Society of Integrative and Comparative Biology Annual Meeting.

Popular Press

`Select Compilation`

News

Dec 2018 ■ HAMR-E, Harvard Ambulatory Microrobot with Electroadhesion
Science News, WIRED, TechXplore, Cosmos (+10 more)

Jul 2018 ■ Rolls-Royce tests cockroach-like robots that help repair plane engines
TechCruch, Telegraph, CNBC, Engadget (+50 more)

Mar 2018 ■ Transition by head-on Collisions in Cockroaches and Robots
Science News, NYTimes, Science Friday, LiveScience (+50 more)

Feb 2018 ■ HAMR, a cockroach inspired robot
it IEEE Spectrum, Wyss News, TechXplore, Digital Trends

Feb 2016 ■ Cockroaches Squeeze through Crevices and Crawl in Confined Spaces
Science News, Nature News, NYTimes, NatGeo (+400 more)

Feb 2010 ■ Racing Crash-Happy Cockroaches - Elizabeth Pennisi
Science Meeting Briefs, 12 February 2010, Vol 327 Science. p 776

Books

Nov 2018 ■ How to Walk on Water and Climb up Walls: Animal Movement and the Robots of the Future – David Hu
Princeton University Press

Videos

Mar 2014 ■ The secrets of nature's grossest creatures, channeled into robots – Robert J Full
TED2014

Invited Talks

Research

Jun 6, 2019 ■ Amazon re:MARS, Las Vegas, US

Apr 8, 2019 ■ Graduate School of Design, Harvard University, UK

Mar 20, 2019 ■ Biomechanics and Mechanobiology, Cambridge University, UK

Mar 6, 2019 ■ Mechanical Engineering, Tufts University, US

Feb 25, 2019 ■ Mechanical Engineering, University of Texas Austin, US

Invited Talks (continued)

Feb 11, 2019	Mechanical Engineering, University of California Riverside, US
Feb 8, 2019	Mechanical, Industrial & Manufacturing Engineering, Oregon State University, US
Feb 4, 2019	Mechanical & Industrial Engineering, University of Massachusetts Amherst, US
Jan 18, 2019	Mechanical Engineering, University of Colorado Boulder, US
Dec 10, 2018	Mechanical & Nuclear Engineering, Penn State University, US
Nov 13, 2018	World Conference for Inspection and Maintenance Robotics, Galveston, US
Aug 1, 2018	Biosciences Science and Engineering, Indian Institute of Science, Bangalore, IN
Jun 30, 2018	Carnegie Mellon University, Pittsburg, US *(Robotics: Science and Systems: Workshop on Dynamics and Control of Small Legged Robots)*
May 14, 2018	US Army Natick Soldier Research, Development, and Engineering Center, Natick, US *(Sigma Xi Lecture Series)*
Mar 4, 2018	Mechanical Engineering, University of California Santa Barbara, Santa Barbara, US
Nov 17, 2017	Concord Field Station, Harvard University, Bedford, US
Oct 11, 2017	School of Engineering and Applied Sciences, Harvard University, Cambridge, US
Oct 10, 2015	Young Investigators Meeting, MIT, Cambridge, US
Nov 20, 2013	Avanti Learning Centre, Mumbai, IN
Jul 09, 2013	BioRobotics Institute - Scuola Superiore Sant'Anna, Piza, Italy
Dec 27, 2012	Young Researchers' Conclave - IIT Gandhinagar, Gandhinagar, IN
Dec 24, 2012	Indian Institute of Technology Bombay, Mumbai, IN

Outreach

May 10, 2016	Museum of Natural History, Harvard University, Cambridge, US
Mar 8, 2016	Park School, Brookline, US

Professional Experience

Member of

Society of Integrative and Comparative Biology (SICB)
Society of Experimental Biology (SEB)
The Institute of Electrical and Electronics Engineers (IEEE)

Representative of

Broadening Participation Committee, SICB 2018-21

Organizer of

Robotics Inspired Biology Workshop, IROS 2017

Judge for

Best Student Paper Award, Division of Comparative Biomechanics, SICB 2017-18

Reviewer for

Proceedings of the National Academy of Sciences (PNAS)
Proceedings of The Royal Society
Bioinspiration and Biomimetics (B&B)
Journal of Mechanical Engineering Science
Journal of Micromechanics and Micro-engineering (JMM)
International Conference on Intelligent Robots and Systems (IROS)
International Conference on Robotics and Automation (ICRA)
Robotics Automation and Letters (RA-L)

International Conference on Automation Science and Engineering (CASE)
Frontiers in Zoology
Nature Scientific Reports

Teaching Experience

CU-Boulder

Harvard

Fall 2016 ■ Physics for Engineers (TA)

UC Berkeley

Fall 2013 ■ Motor Control (TA, **Outstanding Graduate Student Instructor**)
Spring 2012 ■ Mechanisms of Organisms (TA)

IIT Bombay

Spring 2009 ■ Experimental Engineering Lab (TA)
Fall 2008 ■ Advanced Manufacturing Processes (TA)

Mentorship

CU-Boulder

Harvard

Doctoral	■ Mortiz Graule		
	Neel Doshi	postdoc	Massachusetts Institute of Technology
	Mary Salcedo	postdoc	Virginia Tech University
	Benjamin Goldberg	engineer	John Deere
Masters	■ Samantha Castellanos	engineer	Boston Dynamics
	Fabian Landers	grad	ETH Zurich
	Hayley McClintock	grad	Yale University
	Sebastian de Rivaz	engineer	Apple
Undergraduate	■ Lyra Wanzer	engineer	Symbiotic
	2019 Outstanding Senior Design Thesis Award (Mechanical Engineering)		
	Daniel Ayane	engineer	Capitol One

UC Berkeley

Doctoral	■ Nate Hunt	faculty	University of Nebraska Omaha
	Chris Warner	postdoc	University of California Santa Barbara
Masters	■ Shilpa Naik	engineer	Diamler
	Arun Cherian	founder	Rise Legs Inc
Undergraduate	■ Crystal Lee	medicine	Thomas Jefferson Univ
	2016 Marion Diamond Award for outstanding research, teaching and leadership		
	Michael Tsang	grad	Univeristy of California Los Angeles
	Yung-En Perng	grad	Massachusetts General Hospital
	Joshua Nowak	engineer	Transcriptic
	2014 Pre-Initiative for Maximizing Student Development Fellow (Pre-IMSD)		
	Chirag Soni	engineer	JGC Corp.
	Avantika Pathak	medicine	University of South California
	Cody Merritt	grad	Univeristy of Stuttgart
	Chris Dallman	grad	University of Bielefeld
	Sofia Chang	grad	University of California Berkeley
	Brian McRae	grad	University of California Berkeley
	Debbie Li	grad	Stanford University
	2012 Departmental Citation (Integrative Biology) for outstanding undergraduate research		
	Andy Mahopatra	medicine	University of Washington St.Louis
	2012 Chair's Award (BioEngineering) for highest academic performance		
High School	■ Katherine Fearing	undergrad	University of California Berkeley

Outreach Activities

2017–	Broadening Participation Student Mentor, SICB
2015–2017	Cambridge Science Festival
2015	Dinner with Scientist, Oakland Zoo
2013–2015	Bay Area Students in Science (BASIS)
2014	OpenMAKE, Lawrence Hall of Science
2012–2014	Science and Engineering Community Outreach (SECO)
2013	Pre-IMSD Student Mentor
2005–2009	Technical Activities Club, IIT Bombay (*won Special Mention Award 2011*)

References

Available on Request