

Jessica S. Lee

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Experience

9/13 - Present **Graduate Researcher**

University of California, Berkeley

Ronald Fearing's Biomimetic Millisystems Lab

- Designed and manufactured anisotropic collapsible leg spines using UV laser
- Constructed palm-sized cockroach-inspired running robot through Smart Composite Microstructure (SCM) with IR laser, polymer forming, laminating, transmission assembly, 3D printing and surface mounting
- Made terrestrial robots faster, more energy efficient, able to climb higher inclines and pull larger loads by creating bio-inspired leg spines
- Designing a clawed gripper to increase a jumping robot's traction and perching ability

9/17 - 12/17 **Visiting Researcher**

NASA Ames Research Center

Kenneth Cheung's Coded Structures Lab

- Assisted in new lattice building-block design to be assembled into structures with high stiffness to weight ratios that can be disassembled and reconfigured to other shapes
- Designed and created a new end effector for robots to traverse and manipulate lattice

2/16 - Present **Graduate Researcher**

University of California, Berkeley

Robert Full's Poly-PEDAL Lab

- Designed and conducted experiments testing the effectiveness of cricket tibia spines and foot pads on various substrates
- Investigated tail righting strategies in geckos

7/15 - 9/15 **Visiting Graduate Researcher**

Seoul National University, South Korea

Kyu-jin Cho's BioRobotics Lab

- Designed and manufactured a bio-inspired compound foot with spines and foot pads
- Manufactured 3cm flea-inspired jumping robot through Smart Memory Alloy (SMA) spring construction and Smart Composite Microstructure (SCM) with IR laser
- Robot able to jump on more surface types, on some surfaces jumps farther and faster

6/14 - 7/14 **Visiting Graduate Researcher** **École polytechnique fédérale de Lausanne, Switzerland**

Jaime Paik's Reconfigurable Robotics Lab

- Designed and manufactured Soft Pneumatic Actuators (SPAs) for an earthworm-inspired soft, crawling robot to traverse a 3-D space
- Implemented new manufacturing strategies, increasing number of usable SPAs by 40%

Education – Mechanical Engineering

Ph.D. Candidate

University of California, Berkeley

GPA: 3.92 Quads Pass Date: March 2016

Expected Graduation **June 2018**

Advisor: Ronald Fearing, Robert Full, and Alice Agogino

M.S.

University of California, Berkeley

GPA: 3.92 Graduation June 2015

B.S.

University of California, Santa Barbara

GPA: 3.80 (ranked 5th in class) Graduation June 2013

Skills, Tools, and Expertise

Engineering: UV Laser, IR Laser, 3D Printing, machine shop (lathing, milling...), surface mounting

Software: Matlab, Java, C, SolidWorks, AutoCad, Labview, Photoshop, R statistics, Html, CSS,

Coursework: Social Psychology, Electromechanical Devices, Biomimetic Engineering Behavior of Engineering Materials, Organism Mechanics, Design Thinking, Sustainable Manufacturing

Specialization: Bio-inspired design, design and manufacturing robots of Smart Composite

Microstructure (SCM) and Soft Pneumatic Actuators (SPA), rapid prototyping, experimental biology

Interests: Skydiving, scuba diving, skiing, basketball, hiking, kayaking, traveling, mandarin, piano

Outreach and Leadership

Networking Chair for Graduate Women in Engineering (GWE)

Networking Chair for Women in Computer Science and Engineering (WICSE)

President of Science and Engineering Community Outreach (SECO)

Robotics Lead for Electrical Engineering Outreach

Tutoring Chair for Tau Beta Pi (Engineering Honor Society)

Fellowships and Honors

- **NSF GRFP** - National Science Foundation Graduate Research Fellowship Program
- NSF IGERT - Integrative Graduate Education and Research Trainee
- **Division Winner of IET PATW** - Institution of Engineering and Technology Present Around the World (PATW) Competition 2014/2015
- College of Engineering Dean's Honors Program at UCSB, Member of NSCS

Publications

- 2018 Lee, J.S., Plecnik, M., Yang, J and Fearing, R.S. Self-Engaging Spined Gripper with Dynamic Penetration and Release for Steep Jumps (**ICRA**)
- 2017 Lee, J.S., Fearing, R.S., Cho, K.J., and R. Full. Crickets Jumping from Diverse Substrates Inspire Leg Design in a Millirobot. Society for Integrative and Comparative Biology (**SICB**)
- 2016 Lee, J., Fearing, R. S., Cho, K. Compound Foot for Increased Millirobot Jumping Ability. Climbing and Walking Robots and Support Technologies for Mobile Machines (**CLAWAR**)
- 2015 Lee, J.S., and Fearing, R.S. Anisotropic collapsible leg spines for increased millirobot traction. IEEE/RSJ International Conference on Robotics and Automation (**ICRA**)
- 2015 Lee, J.S., Haldane, D., Fearing, R., and R. Full. Biologically inspired collapsible spines increase performance in legged robot. Society for Integrative and Comparative Biology
- 2015 Haldane, D.W., Lee, J. S., et al. Integrated Manufacture of Exoskeletons and Sensing Structures for Folded Millirobots. Journal of Mechanisms and Robotics (**JMR**)

Undergraduate Experience

- 10/12 – 5/13 **Undergraduate Researcher**, Kim Turner's Mechanics of Microscale Systems (MEMS) Lab
- Used Micro-Electro-Mechanical Systems to fabricate gecko inspired dry adhesives
 - Designed and built a system to test the adhesives on a macro scale
- 6/12 – 9/12 **Structures Engineering Intern**, United Airlines
- Assisted in fixing and maintaining the skin and skeleton of United Airlines' airplanes
 - Created maintenance plans to prevent cracks in the Airbus fuselages
- 8/11 – 6/12 **Engineering Intern**, Intouch Health
- Quality tested and built new prototypes of components for remote presence robots
 - Created and implemented new procedures to improve the efficiency of the manufacturing floor
- 8/10 - 4/11 **Engineering Intern**, Inogen
- Surface mounted and tested various electrical components for the product
 - Redesigned and found new parts for the pressure sensor in the oxygen concentrators
- 2/08 - 6/08 **International Robogames Competitor**, initiated the robotics independent study program
- Designed and constructed a Sumobot using a PIC microcontroller, metal bending, milling, custom board, UV laser, proximity and line sensors – placed 4th