Hannah Stuart PhD

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University of California

EDUCATION

Doctor of Philosophy, Mechanical Engineering — **Stanford University**
Biomimetics and Dexterous Manipulation Lab — *2013- 2018*

Master of Science, Mechanical Engineering — **Stanford University**
Depth Areas: Smart Product Design, Dynamics — *2011-2013*

Bachelor of Science, Mechanical Engineering — **George Washington University**
2007-2011

APPOINTMENTS

Assistant Professor, University of California at Berkeley — *January 2018-present*
Department of Mechanical Engineering, College of Engineering
Principal Investigator: Embodied Dexterity Group (EDG), **edg.berkeley.edu**

AWARDS

Hellman Fellow, Capacity for great distinction in research, University of California Berkeley — *2020*
Distinguished Service Award, Outstanding reviewer, IEEE Robotics & Automation Letters — *2020*
Lieberman Fellowship, Stanford University — *2016*
National Science Foundation Graduate Research Fellowship — *2012*
Stanford University Graduate Fellowship — *2011*

FUNDING SOURCES

Hellman Fellows Fund — *2020-2021*
Arts and Design Creative Discovery Grant Award — *2020*
NASA Space Technology Research Fellowship Grant — *2019-2021*
COE Fire Research Fund — *2019-2020*
CITRIS and the Banatao Institute, 2019 Core Seed Funding — *2019-2020*

JOURNAL PUBLICATIONS

Li., M., Melville, D., Chung, E., **Stuart, H.S.** (2020). "Milliscale features increase friction of soft skin in lubricated contact." IEEE Robotics and Automation Letters.

Negrello, F.[1], **Stuart, H.S.**[1], Catalano, M.G. (2019). "Hands in the Real World." Frontiers in Robotics and AI, Research Topic Hands in the Real World: Connecting End-Effector Design, Sensitivity, and Behavior. [1]*Authors contributed equally.*

Wang, S., Jiang, H., Huh, T.M., Sun, D., Ruotolo, W., Miller, M., Roderick, W.R.T., **Stuart, H.S.**, Cutkosky, M.R. (2019) "SpinyHand: Contact Load Sharing for a Human-Scale Climbing Robot." ASME Journal of Mechanisms and Robotics, 11(3):031009.

Stuart, H.S., Wang, S., Cutkosky, M.R. (2018) "Tunable Contact Conditions and Grasp Hydrodynamics using Gentle Fingertip Suction." IEEE Transactions on Robotics, 36(2):150-166.

Stuart, H., Wang, S., Khatib, O., Cutkosky, M.R. (2017). "The Ocean One hands: An adaptive design for robust marine manipulation." The International Journal of Robotics Research, 36(2):150-166.

Khatib, O., Yeh, X., Brantner, G., Soe, B., Kim, B., Ganguly, S., **Stuart, H.**, Wang, S., Cutkosky, M., Edsinger, A., Mullins, P., Barham, M., Voolstra, C., Salama, K., L'Hour, M., Creuze, V. (2016). "Ocean One: A Robotic Avatar for Oceanic Discovery." Robotics & Automation Magazine, 23(4):20-29. *Featured on cover of magazine.*

Aukes, D. M., Heyneman, B., Ulmen, J., **Stuart, H.**, Cutkosky, M. R., Kim, S., Garcia, P., Edsinger, A. (2014). "Design and testing of a selectively compliant underactuated hand." The International Journal of Robotics Research, 33(5):721-735.

REFEREED CONFERENCE PROCEEDINGS

McPherson, A., Patel, V.V., Downey, P.R., Alvi, A.A., Abbott, M., **Stuart, H.S.** "Motor-augmented Wrist-Driven Orthosis: Flexible Grasp Assistance for People with Spinal Cord Injury." 2020 IEEE Engineering in Medicine and Biology International Conference.

Nadeau, P., Abbott, M., Melville, D., **Stuart, H.S.** (*in press*). "Tactile sensing based on fingertip suction flow for submerged dexterous manipulation." 2020 IEEE International Conference on Robotics and Automation (ICRA).

Kaneishi, D., Leu, J.E., O'Donnell, J., Affleck, C., Matthew, R.P., McPherson, A., Tomisuka, M., **Stuart, H.S.** (2020). "Design and Assessment of a Single-size Semi-soft Assistive Mitten for People with Cervical Spinal Cord Injuries." 2019 IEEE-RAS International Conference on Humanoid Robots (Humanoids).

Li, M.S., Van der Zande, R., Hernandez-Agreda, A., Bongaerts, P., and **Stuart, H.S.** "Gripper design with rotational-constrained teeth for mobile manipulation of hard, plating corals with human-portable ROVs." 2019 IEEE-MTS OCEANS Conference Proceedings.

Kaneishi, D., Matthew, R.P., Leu, J.E., O'Donnell, J., Tomisuka, M., **Stuart, H.S.** "Hybrid Control Interface for a Semi-soft Assistive Glove for people with Spinal Cord Injuries." 2019 IEEE International Conference on Rehabilitation Robotics (ICORR).

Stuart, H. S., Bagheri, M., Wang, S., Barnard, H., Sheng, A. L., Jenkins, M., Cutkosky, M. R. "Suction Helps in a Pinch: Improving Underwater Manipulation with Gentle Suction Flow." 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems Proceedings (IROS).

Stuart, H. S., Wang, S., Gardineer, B. G., Christensen, D. L., Aukes, D. M., & Cutkosky, M. "A compliant underactuated hand with suction flow for underwater mobile manipulation." 2014 IEEE International Conference on Robotics and Automation Proceedings (ICRA).

Stuart, H., Inman, K., & Wang, X. "Initial Development of a Method for Optical Measurement of Water Droplet Formation in the Cathode Flow Channel of a PEM Fuel Cell." 2013 ASME International Conference on Fuel Cell Science, Engineering and Technology.

Dastoor, S., Weiss, S., **Stuart, H.**, Cutkosky, M. (2012). "Jumping Robot with a Tunable Suspension Based on Artificial Muscles." Biomimetic and Biohybrid Systems: Lecture Notes in Computer Science, 7375:95-106.

ABSTRACTS & POSTERS

Cao, C., **Stuart, H.**, and Lieu, D.. (2020) "Extension of Resisitive Force Theory to Anchoring Modes During Locomotion." Robotics: Science and Systems, Reacting to Contact Workshop.

Li, M., Shams, M.K., **Stuart, H.S.**; Yahnker, C.R., Ma, R.R., Carpenter, K.C., Kosh, J.R., Barge, L.M.; Creuze, V., Planes, S. "End-Effectors for Frangile Substrate in Extreme Underwater Environments." 2020 International Planetary Probe Workshop.

Treers, L., **Stuart, H.** (2020). "Burrowing Dynamics in Granular Media." Society of Integrative and Comparative Biology Annual Meeting.

Treers, L., **Stuart, H.** (2019). "Decapod-Inspired Mechanisms for Penetration Force Reduction." NSF Bioinspired Geotechnics Workshop.

Nadeau, P., Abbott, M., Melville, D., **Stuart, H.** (2019). "Tactile Feedback Based on Fingertip Suction Flow." Bay Area Robotics Symposium.

Treers, L., **Stuart, H.** (2019). "Bio-Inspired Burrowing." Bay Area Robotics Symposium.

Abbott, M., Melville, D., Cutkosky, M.R., **Stuart, H**. (2018). "Underwater Tactile Feedback with Suction Flow Sensing." Bay Area Robotics Symposium.

Li, M., **Stuart., H.** (2018). "Spiny gripper design for mesophotic coral sampling." Bay Area Robotics Symposium.

NOTABLE PRESENTATIONS

Workshop – Robotics Science and Systems (RSS), Corvallis (*virtual*, COVID-19)	*July 2020*
Workshop – Int. Conf. on Robotics and Auto. (ICRA), Paris (*cancelled*, COVID-19)	*June 2020*
Seminar – ENGR311A: "Women's Perspectives in Engineering," Stanford, CA	*Feb 2020*
Workshop – Industry-UCB-UEC-Keio University Workshop, Tokyo	*Dec 2019*
Seminar – CS529: "Robotics and Autonomous Systems Seminar," Stanford, CA	*Nov 2019*

Workshop – IEEE Int. Conf. on Intelligent Robots and Systems (IROS), Macau *Nov 2019*
Podium presenter – Bay Area Robotics Symposium, Berkeley *Nov 2019*
Workshop – National Academy of Fire Workshop Oct 2019
Workshop – IEEE-RAS Int. Conf. on Humanoid Robots (HUMANOIDS), Toronto *Oct 2019*
Podium presenter – IEEE Int. Conf. on Ocean Technologies (OCEANS), Marseilles *June 2019*
Lecture series – Technological University of Hamburg-Harburg *June 2019*
Seminar – Chevron Fellows Learning Series, Chevron Richmond Technology Center *June 2019*
Seminar – Monterey Bay Aquarium Research Institute *Mar 2019*
Podium presenter – Bay Area Robotics Symposium, Stanford *Nov 2018*
Workshop – IEEE Int. Conf. on Intelligent Robots and Systems (IROS), Madrid *Oct 2018*
Seminar – NASA Jet Propulsion Lab, Pasadena *Jun 2018*
Podium presenter – Berkeley|AutoDesk Research Symposium *Jan 2018*
Podium presenter – Bay Area Robotics Symposium, Berkeley *Nov 2017*
Seminar – CITRIS Design of Robotics and Embedded Systems, Analysis, and Modeling *Oct 2017*
Seminar – University of Washington, Seattle *Apr 2017*
Seminar – University of Colorado, Boulder *Apr 2017*
Seminar – University of California, Berkeley *Mar 2017*
Podium presenter – IEEE Int. Conf. on Intelligent Robots and Systems (IROS), Hamburg *Sept 2015*
Podium presenter – IEEE Int. Conf. on Robotics and Auto. (ICRA), Hong Kong *June 2014*

TEACHING & MENTORSHIP

Instructor, UC Berkeley
ME 179/270 & DES INV 190E-2: Augmenting Human Dexterity (*Spring 2020)*
ME 102B: Mechatronic Design (*Fall 2019, Fall 2020)*
ME 193C/292C & DES INV 190E-2: Upper-Limb Prosthesis Design (*Fall 2018)*
ENGR 25: Visualization for Design (*Spring 2018)*

Student Researchers (*fellowship awards*):
Graduate students in EDG:
Michael Abbott (*National Science Foundation Graduate Research Fellow 2019-2022*),
Cyndia Cao (co-advisee, *NASA Space Technology Research Fellow 2019-2023*),
Erin Chang (*National Science Foundation Graduate Research Fellow 2020-2023*),
Sareum Kim (co-advisee),
Jungpyo Lee (*Korean Government Scholar for Study Overseas*),
Sebastian Lee,
Monica Li (*NASA Space Technology Research Fellow 2019-2023*),
Raghid Mardini,
Andrew McPherson (*UCB Chancellor's Fellow 2020-2022*),
Juan Romero (*Berkeley ME First Year Fellow 2019-2020, NSF Graduate Reserch Fellow 2020-2023*),
Wilson Torres (*McMurtry Family Fellow 2020*),
Laura Treers (*National Defense Science and Engineering Graduate Fellow 2019-2022*)

Graduate student committees:
Alan Zhang, qualifaying exam
Alexandre Immas, qualifying exam
Andrew Barkan, qualifaying exam and dissertation
Anusha Nagabandi, qualifying exam and dissertation
Carolyn Chen, masters thesis, qualifying exam and dissertation
Elaine Kwan, masters thesis
Fatima Hidalgo, qualifying exam
Grederik Ebert, qualifying exam and dissertation
Isabel Huang, qualifying exam and dissertation

Jessica Leu, qualifying exam
Jiaming Zha, masters thesis
Julia O'Donnell, maters thesis
Laura Hallock, qualifying exam and dissertation
Phillip Downey, 5th year masters oral exam

EDG Postdoc: Dr. Tae Myung Huh

Undergraduate: A total of 27 ugrad students have conducted at least 1+ full semester of research in EDG.
Notable undergraduate student research fellowship awards:
Ashlyn D'Orazio (*Regent's Scholar 2020, Jacobs Institute Engineering Design Scholar 2020*),
Natalia Perez (*Jacobs Institute Engineering Design Scholar 2020*),
Kristin Yamane (*Semiconductor Research Corporation Undergraduate Research Scholar 2019-2020*),
Ethan Chung (*Rose Hills Summer Fellow 2019*),
Daniel Santos (*NSF LSAMP, Cal NERDS 2019*),
Philippe Nadeau (*NSERC Scholar 2019*).

Faculty advisor/mentor for EnableTech, a student DeCal to create assistive technologies.

SELECT PROFESIONAL ACTIVITIES

Associate/Guest Editor
Frontiers in Robotics and AI topic "Hands in the Real-World" 2019.
International Conference on Robotics and Automation (ICRA) 2020
International Conference on Intelligent Robots and Systems (IROS) 2020

Organization of international workshops
2018 Int. Conference on Intelligent Robots and Systems. Hands in the Real World (Madrid)
2019 Int. Conference on Intelligent Robots and Systems Automation in Construction (Macau)
2019 Int. Conference on Intelligent Robots and Systems Marine Bioinspired Soft Robots (Macau)