AVA CHEN

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EDUCATION

Columbia University — **2019 – present**
Ph.D in Mechanical Engineering — *New York, NY*
Advisor: Matei Ciocarlie

Columbia University — **2019 – 2021**
M.S. in Mechanical Engineering — *New York, NY*

Massachusetts Institute of Technology (MIT) — **2013 – 2017**
B.S. in Mechanical Engineering — *Cambridge, MA*

HONORS

NIH Ruth L. Kirschstein National Research Service Award (NRSA) F31 — **2023 – 2025**
Columbia University CIRTL Fellow — **2023 – 2024**
Columbia University Presidential Fellowship — **2019 – 2023**
Rising Star in ME 2022 at Stanford University — **2022**
Honorable Mention, MIT MechE deFlorez Design Competition — **2016**

PUBLICATIONS

Peer-Reviewed Journal Articles

[J.2] **A. Chen,** L. Winterbottom, S. Park, J. Xu, D.M. Nilsen, J. Stein, M. Ciocarlie, "Thumb Stabilization and Assistance in a Robotic Hand Orthosis for Post-Stroke Hemiparesis." *IEEE Robotics and Automation Letters*, 7, 8276-8282 (2022)

- Presented in *2022 IEEE RAS/EMBS Intl. Conference on Biomedical Robotics and Biomechatronics (BioRob).* **Finalist, BioRob2022 Best Paper Award**

[J.1] **A. Chen,** K. Kim, P.S. Shamble. Rapid mid-jump production of high-performance silk by jumping spiders. *Current Biology*, 31, R1422-R1423 (2021)

Peer-Reviewed Conference Papers

[C.3] **A. Chen,** L. Winterbottom, K. O'Reilly, S. Park, D.M. Nilsen, J. Stein, M. Ciocarlie. "Design of Spiral-Cable Forearm Exoskeleton to Provide Supination Adjustment for Hemiparetic Stroke Subjects." In *2022 IEEE Intl. Conference on Rehabilitation Robotics (ICORR)* (2022), pp. 1-6.

[C.2] J. Xu, C. Meeker, **A. Chen,** L. Winterbottom, M. Fraser, S. Park, L.M. Weber, M. Miya, D.M. Nilsen, J. Stein, M. Ciocarlie. "Adaptive Semi-Supervised Intent Inferral to Control a Powered Hand Orthosis for Stroke." In *2022 IEEE Intl. Conference on Robotics and Automation (ICRA)* (2022), pp. 8097-8103.

[C.1] T. Cervantes, W.E. Byun*, **A. Chen*,** K. Kim*, K. Nealon*, J. Connor, A. Slocum. "A Device for Quantitative Analysis of the Thumb Ulnar Collateral Ligament." Frontiers in Biomedical Devices, *2018 ASME Design of Medical Devices Conference* (2018)

Submitted for Publication

[S.1] L. Winterbottom*, **A. Chen***, R. Mendonca, D.M. Nilsen, M. Ciocarlie, J. Stein. "Clinician perceptions of a novel wearable robotic hand orthosis for post-stroke hemiparesis." (2023)

Patents

[P.1] M. Ciocarlie, J. Stein, **A. Chen,** S. Park, and D.M. Nilsen. "Robotic Hand Orthosis For Stroke", Application #: US 63/249,456

Workshop Contributions

[W.1] **A. Chen*,** J. Xu*, and M. Ciocarlie. "MyHand: a Wearable Hand Orthosis for Stroke." Workshop presentation in *Intelligent Robots and Systems (IROS), 2021 Intl. Conference on. Challenges and Opportunities of Human-Robot Symbiosis: from Wearable Robots to Neurorobotics.* (2021)

[∗ indicates equal contribution]

GRANT PROPOSAL EXPERIENCE

- *Impact of biofeedback and task-specific training with a robotic hand orthosis on voluntary muscle modulation for rehabilitation post-stroke.* NIH F31 1F31HD111301-01A1 8/2023–1/2025 $72,587. **PI: Chen**
- *Reciprocal Learning for Intent Inferral on an Active Hand Orthosis for Stroke.(Pending)* PI: Ciocarlie/Stein/Nilsen NSF M3X program. Contributed to conceptualization, methodology, investigation, preliminary data, and writing.

TEACHING EXPERIENCE

Academic

Teaching Assistant, Columbia MECE E4602 – Introduction to Robotics **Fall 2020**
Lab Assistant, Harvard LS50 – Integrated Science **Spring 2018, Spring 2019**

Extracurricular

Mentor and Teaching Assistant, Research Science Institute (RSI at MIT) **2014**
Teaching Assistant, Bellarmine University Summer Youth Camps **2012 – 2013**

SERVICE

External Paper Reviewer

IEEE Transactions on Medical Robotics and Bionics (T-MRB) **2023**
Scientific Reports **2022, 2023**
IEEE Intl. Conference on Robot and Human Interactive Communication (RO-MAN) **2022, 2023**
IEEE Intl. Conference on Rehabilitation Robotics (ICORR) **2022**
IEEE RAS/EMBS Intl. Conference on Biomedical Robotics & Biomechatronics (BioRob) **2022**
IEEE Intl. Conference on Robotics and Automation (ICRA) **2021, 2022**
IEEE Robotics and Automation Letters (RA-L) **2021, 2022**
IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE) **2020**

Invited Speaker

Harvard Bauer Forum – Speaker, "How jumping spiders use silk to orient themselves in midair" **Oct. 2018**
CEE 35th Anniversary Celebration – Speaker, "How Jumping Spiders Jump" **Oct. 2018**

University Service

Invited Panelist, Columbia Engineering Your PhD **Aug. 2023**
Invited Panelist, Columbia WISC STEM Field Exploration Fair, "Behind the Lab Scenes" **Apr. 2022**
Center for the Integration of Research, Teaching, and Learning (CIRTL) Fellow **2023 – present**
Conference Volunteer, Robotics: Science and Systems (RSS) **2022**
Mentor, Columbia University Engineering the Next Generation (ENG) **2022**

Extracurricular

Question Reviewer, US DOE National Science Bowl (NSB) **2022**
Judge, Kentucky Science and Engineering Fair **2021**
Mentor, Women in Science at Columbia (WISC) **2020 – 2021**
Judge, MIT Mechanical Engineering Research Exhibition **2020**
Volunteer, Adaptive Climbing Group NY **2019**
Question Writer, USA Biolympiad (USABO) **2019**
Volunteer, Research Science Institute (RSI) at MIT **2015, 2018**
Judge, Sweden Research Academy for Young Scientists (RAYS) **2015**

Professional Societies: IEEE, ICORR, SWE

RESEARCH MENTORSHIP

Masters Students

Pedro La Rotta **2023**
Carolyn David **2022 – 2023**
Preethika Chivukula **2021 – 2022**

Undergraduate Students

Connor Lee **2023 – present**
Alex Deli-Ivanov **2022 – present**
Joaquin Palacios **2021 – 2023**
Katherine O'Reilly [C.3] **2020 – 2023**
Ciara Little **2020 – 2021**
Katelyn G. Mitchell **2020 – 2021**
Frederick Horne **2019**
Rowen VonPlagenhoef **2019**
Eliot Burnes **2018 – 2019**
Henry Burnes **2018 – 2019**
Lincoln Sorscher **2018**

PREVIOUS POSITIONS

Harvard Dept. of Organismic & Evolutionary Biology, Shamble Lab **2017 – 2019**
Research Assistant with Dr. Paul Shamble

Dephy, Inc. **Summer 2017, Fall 2018**
Mechanical Engineering Intern

MIT Media Lab, Biomechatronics Group **2013 – 2017**
Undergraduate Researcher with Dr. Hugh Herr, Arthur Petron, and Matt Carney

Apple Inc. **Summer 2016**
Product Design Validation Engineer Intern

Formlabs **Summer 2015**
Mechanical Engineering Intern

Brain Power, LLC **Winter 2015**
Hardware Intern

Cardiovascular Innovation Institute & Christine M. Kleinert Institute **2012 – 2013**
Research Intern with Dr. Nolan Boyd and Dr. Christina Kaufman

SIDE PROJECTS

Untethered Gait Tracking for Rehabilitation **2018 – 2019**
Collaboration with FIGUR8, Inc. to use their wearables platform for monitoring gait trends during self recovery & long-term effects of rehabilitation post knee-reconstruction surgery.

MIT East Campus Roller Coaster **2015**
Formed and led team of students to complete $15,000 construction project in 8 days.
Unofficial Guinness World Record holder for Steepest Wooden Roller Coaster.

More documentation on side projects at https://www.avamakesthings.com