

XIANGYU PENG

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[Homepage](#) [Google Scholar](#)

EDUCATION

University of Michigan (Ann Arbor), USA

August 2021 - Present

Ph.D. in Robotics, GPA: 4.0/4.0

University of Michigan (Ann Arbor), USA

August 2019 - April 2021

M.S. in Robotics, GPA: 4.0/4.0

Shanghai Jiao Tong University, China

September 2015 - June 2019

B.E. in Mechanical Engineering, GPA: 86.4/100

PUBLICATION

[1] **Xiangyu Peng**, Shunzhang Li, and Leia Stirling, “Integrating User Adaptation into an Adaptive Controller for Enhanced Task Performance in Powered Upper Limb Exoskeletons”, *IEEE Robotics and Automation Letters (RA-L)*, 2023 (under review)

[2] **Xiangyu Peng** and Leia Stirling, “Examination of Biofeedback to Support the Use of EMG-Based Upper-Extremity Exoskeletons Under Proportional Myoelectric Control”, *IEEE Transactions on Medical Robotics and Bionics (T-MRB)*, 2023 (under review)

[3] **Xiangyu Peng** and Leia Stirling, “Effects of Biofeedback on Muscle Effort Reduction when Holding Positions with a Powered Upper Limb Exoskeleton”, *67th Annual Meeting of the Human Factors and Ergonomics Society (HFES)*, Washington DC, October 23-27, 2023 (Accepted)

[4] **Xiangyu Peng**, Yadrianna Acosta-Sojo, Man I Wu, and Leia Stirling, “[Actuation Timing Perception of a Powered Ankle Exoskeleton and its Associated Ankle Angle Changes During Walking](#)”, *IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE)*, 2022

[5] **Xiangyu Peng**, Yadrianna Acosta-Sojo, Man I Wu, and Leia Stirling, “[Perception of Powered Ankle Exoskeleton Actuation Timing During Walking: A Pilot Study](#)”, *The 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Guadalajara, Mexico, October 31 - November 4, 2021

[6] **Xiangyu Peng**, Ningbin Zhang, Lisen Ge, and Guoying Gu, “[Dimension Optimization of Pneumatically Actuated Soft Continuum Manipulators](#)”, *The 2nd IEEE International Conference on Soft Robotics (RoboSoft)*, Seoul, Korea, April 14-18, 2019

RESEARCH EXPERIENCE

Integrating User Adaptation into Exoskeleton Controller

Oct 2022 - Present

Advisor: Prof. Leia Stirling, University of Michigan

Graduate Research Assistant

- Developed an adaptive controller for a powered upper limb exoskeleton, capable of real-time monitoring and adjustment to the user’s changing motor program.
- Pioneered the integration of the user adaptation process into controller design, enhancing user intention classification accuracy and facilitating coordination during the adaptation phase.

EMG Biofeedback Helps the Usage of Upper Exoskeletons

Sep 2021 - Oct 2022

Advisor: Prof. Leia Stirling, University of Michigan

Graduate Research Assistant

- Designed visual and haptic biofeedback for an EMG-based upper-extremity exoskeleton to study its impact on user device utilization, potentially enhancing user adaptation and task performance.

- Explored the learning process of novice users using exoskeletons to balance task accuracy while reducing muscle efforts.

Human Perception of Exoskeleton Actuation Timing

Advisor: Prof. Leia Stirling, University of Michigan

May 2020 - August 2021

Graduate Research Assistant

- Designed a human subject study to assess human perception of changes in exoskeleton actuation timing, yielding insights into user comfort, coordination, trust, and the sensorimotor system's response to behavior changes.
- Created a boot algorithm to deliver targeted torque timing within each gait cycle.
- Developed an Android app to reduce potential distractions impacting participant perception and designed a Python GUI for precise device control, adhering to established human study protocols.

Instability phenomenon on Soft Manipulator

Advisor: Prof. Guoying Gu, Shanghai Jiao Tong University

February 2018 - July 2019

Undergraduate Research Assistant

- Investigated the common instability phenomenon present in soft manipulators and examined the impact of Length to Diameter Ratio (LDR) on the workspace of these manipulators.
- Designed and constructed a novel two-section soft manipulator that incorporated three fiber-reinforced actuators in each section, conducting experiments to validate simulation findings.
- Proposed the concept of instability and a novel metric, workspace ratio, for evaluating the performance of soft manipulators in terms of their workspace, offering design insights for future applications.

AWARDS AND HONORS

| | |
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| Rackham Travel Grant (\$900) | 2023 |
| NIOSH PPRT award (\$20,000) | 2023 |
| Robotics PhD Fellowship | 2021 |
| Excellent Undergraduate in Shanghai | 2019 |
| Honors degree for outstanding scholastic and scientific research performances in SJTU | 2019 |
| Design Excellent Award – 2 nd Place for Capstone Design Project EXPO | 2019 |
| Hongyi Overseas Research Scholarship (Top 10%) | 2018 |
| 1 st Prize NPIC Scholarship | 2016, 2017 |
| Excellent Student of SJTU selected with overall performance (Top 5%) | 2016, 2017 |

OTHERS

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|-------------------|--|
| Membership | IEEE Student Member, 2021, 2023 |
| | EMBS Graduate Student Member, 2021 |
| | HFES Student Member, 2021, 2023 |
| Reviewer | IEEE Robotics and Automation Letters (RA-L), 2022 |
| | IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE), 2022 |
| | Human Factors and Ergonomics Society Annual Meeting (HFES), 2023 |
| Outreach | Discover Engineering Camp, 2022 |
| | WISE Camp, 2022, 2023 |
| | Wines Elementary School, 2022 |
| | Allen Elementary School Robotics Visit, 2023 |
| | Pittsfield Elementary School, 2023 |