XIANGYU PENG

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EDUCATION

University of Michigan (Ann Arbor), USA *September 2019 - Present*
M.S. in Robotics, GPA: 4.0/4.0

Shanghai Jiao Tong University, China *September 2015 - June 2019*
B.E. in Nuclear Engineering and Technology, GPA: 86.4/100

Stanford University, USA *June 2017 - August 2017*
Intensified Study in Computer Science (Summer Session), GPA: 4.0/4.0

PUBLICATION & PATENT

[1] **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 (Accepted)

[2] **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

[3] Yeyang Fang, Zhaohan Yuan, Hankun Yu, Dan Yang, **Xiangyu Peng**, Liqiang Gu, and Mengqi Liu, "A kind of wheelchair with spinal traction function", Jun.13 2017, CN Patent 10682162

RESEARCH EXPERIENCE

Ankle Perception on Actuation Timing of Exoskeleton *January 2020 - Present*
Advisor: Prof. Leia Stirling, University of Michigan *Research Assistant*

- Designed study to measure human ankle perception towards exoskeleton actuation timing, thus helping with design requirement for the precision of exoskeletons and understanding of human biomechanics.
- Built experiment setup and designed test protocols for baseline test to quantify human ankle perception of position and velocity when seated, in comparison with the perception when people are wearing exoskeletons while walking.
- Designed an Android app to minimize potential distractions that could influence people's perception, and developed a Python GUI to control the device following pre-determined human study protocols.
- We are currently conducting human tests and collecting data for further analysis.

Kirigami Scale Design on Snake Robot *July 2018 - October 2018*
Advisor: Prof. Chen Li, Johns Hopkins University *Research Assistant*

- Designed and tested plastic Kirigami scales with anisotropic frictional properties combined with soft backings to increase compliance and reduce instability of snake robot in traversing gaps or bumps.
- Analyzed several design parameters affecting the wave efficiency of snake robot and found the optimal combination for the largest forward speed, reaching up to 0.4 in wave efficiency.
- Compared and summarized the performance of two kinds of snake robot (with wheels / scales).

Instability phenomenon on Soft Manipulator *February 2018 - July 2019*
Advisor: Prof. Guoying Gu, Shanghai Jiao Tong University *Research Assistant*

- Investigated a common instability phenomenon existed in soft continuum manipulator and studied the effect of Length to Diameter Ratio (LDR) on manipulators' workspace through Finite Element Analysis.
- Designed and fabricated a novel two-section soft continuum manipulator combining three fiber-reinforced actuators in each section and carried out experiments to validate simulation results.
- Proposed the concept of Instability and a new measure variable, workspace ratio, to analyze soft manipulator's performance regarding to its workspace, which can guide design for future application.

sEMG-controlled Soft Pneumatic Gripper *September 2017 - January 2018*
Advisor: Prof. Guoying Gu, Shanghai Jiao Tong University *Research Assistant*

- Designed a surface electromyography (sEMG) controlled soft gripper for dexterous grasping.
- Mimicked human muscle to design a novel soft gripper. With four fingers and each finger containing two chambers, the gripper is able to achieve four motion modes: grasping, abduction, rest and stiffening. Stiffening can be regarded as one of the motion modes.
- Tested its force and dexterous performance for grasping objects in different size, weight and hardness.
- Participanted in the 3^{rd} National Soft Robotics Innovation Design Competition.

AWARDS AND HONORS

Rackham International Student Fellowship (nominated)	2020
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
3^{rd} Prize in the 4^{th} Qian Xuesen Innovative Competition in SJTU	2017
1^{st} Prize NPIC Scholarship	2016, 2017
Excellent Student of SJTU selected with overall performance (Top 5%)	2016, 2017
2^{nd} Prize NPIC Scholarship	2015

RELEVANT GRADUATE COURSES

ROB 501 - Math for Robotics (A+)	Fall 2019
ROB 550 - Robotics Systems Lab (A-)	Fall 2019
EECS 505 - Computational Machine Learning & Data Science (A)	Fall 2019
EECS 504 - Foundations of Computer Vision (A)	Winter 2020
EECS 545 - Machine Learning (A-)	Winter 2020
EECS 460 - Control Systems Analysis and Design (A+)	Fall 2020
EECS 498 - Introduction to Algorithmic Robotics (A+)	Fall 2020
IOE 512 - Dynamic Programming (A+)	Fall 2020
ROB 646 - Mechanics of Human Movement	Winter 2021

SKILLS

English	TOEFL 110 (30 R + 28 L + 23 S + 29 W)
	GRE 325 (V 155, 69% + Q 170, 96% + W 3.5, 41%)
Computer Languages	Python, MATLAB, C/C++
Software & Tools	Arduino, Raspberry Pi, Android Studio, LaTeX, Solidworks, ABAQUS