

SHAOJIA WANG

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EDUCATION

University of Toronto

BE in Mechanical Engineering

Toronto, Canada

Sept 2018 – Jun 2023 (expected)

- **GPA:** 3.96/4.00 (Graduating in 2023 with high honours)
- **Minors:** Robotics; Artificial Intelligence; Engineering Business
- **Selected Awards:** Dean's Honors List in all semesters; Sexton Scholarship; University of Toronto Excellence Award (UTEA); Municipal Outstanding Student Representative Award; MicroTAS 2022 Best Paper Award
- **Certificate:** Certified SolidWorks Expert (CSWE): One of 6000 certificate holders worldwide.

Xiamen University

Exchange Student, Summer School

Online

Jun 2020 – Jul 2020

- Courses: Microeconomics, Macroeconomics | Course grades: A+

PUBLICATIONS

1. Pengfei Xu, **Shaojia Wang**, Angela Lin, Hyun-Kee Min, Zhanfeng Zhou, Wenkun Dou, Yu Sun, Dr. Xi Huang, Helen Tran, Xinyu Liu. Conductive SWCNT/PDMS Bottlebrush Elastomers for Ultrasoft Electronics. Manuscript submitted for publication, *Nature Communications*
2. **Shaojia Wang**, Pengfei Xu, Xinyu Liu. 3D Co-Printing of Ionic Hydrogel and Elastomer for Fabrication of Wearable Sensors. Accepted, Best Paper Award, *MicroTAS*
3. **Shaojia Wang**, Pengfei Xu, Runze Zuo, Xinyu Liu. 3D Co-Printing of Ionic Hydrogel and Elastomer for Facile Fabrication of Wearable Sensors and Soft Robots. Manuscript submitted for publication, *IEEE RA-L*
4. Siddhartha Challa, Pengfei Xu, **Shaojia Wang**, Xinyu Liu. Ultrasoft and Ionically Conductive Bottlebrush elastomer for bioelectronics. Manuscript submitted for publication, *AFM*
5. Runze Zuo, Zhanfeng Zhou, Zhen Qin, Peng Pan, **Shaojia Wang**, Binbin Ying, Xinyu Liu. Compact Underwater Robot with Depth Independent Hydraulic Powered Soft Gripper. Manuscript submitted for publication, *T-Mech*
6. Zhanfeng Zhou, Matthew Du, Runze Zuo, **Shaojia Wang**, Xinyu Liu. A Cable-Driven Soft Biomimetic Robotic Hand with In-hand RGB-D Camera for Dexterous Grasping and Manipulation. Manuscript submitted for publication, *IEEE T-RO*
7. Peng Pan, Zhen Qin, William Sun, Yuxiao Zhou, **Shaojia Wang**, Pengfei Song, Yong Wang, Changhai Ru, Xin Wang, John Calarco, Xinyu Liu. A Spiral Microfluidic Device for Rapid Sorting, Trapping, and Long-term Live Imaging of Caenorhabditis Elegans Embryos. Manuscript submitted for publication, *Nature Microsystems & Nanoengineering*

RESEARCH EXPERIENCE

Professor Xinyu Liu's Lab, University of Toronto

Toronto, Canada

Co-op 12-month Internship (Full time)

Feb 2021 – Sept 2022

Ultrasoft Material for Electronics

Research Assistant to Professors Xinyu Liu and Professor Helen Tran

- Conducted a variety of material testing including mechanical, electrical, and rheological testing, etc., and synthesized a new type of ultrasoft elastomer material
- Printed a five-by-five resistive sensor array touchpad device and electrodes utilizing 3D DIW for demonstration and ECG testing, used Arduino and python for data acquisition
- Developed a MATLAB algorithm for touchpad real-time data collection of de-noise, processing, and visualization during sensing ultra-lightweight objects around 0.1g
- Utilized the touchpad to control the robot arm for further demonstration of human-machine interaction
- Composed a research paper as the second author and submitted part of the paper to *Nature Communications*

3D Printing of Soft Magnetic Robotics

Research Assistant to Professor Xinyu Liu

- Prepared and synthesized soft magnetic printing ink including NdFeB microparticles, bottlebrush elastomers, etc.
- Conducted material testing including magnetization and mechanical characterization
- Fabricated a magnetic slug for bio-memetic demonstration with laser cutting and molding techniques
- Designed a magnetic field manipulation system using eight electromagnets with an integrated moving platform for magnetic robot control

Professor Xinyu Liu's Lab, University of Toronto

Toronto, Canada

Summer Research (Full time)

May 2021 – Sept 2021

Tensile Tester Designing

Research Assistant to Professor Xinyu Liu

- Designed and self-built a kit-type laboratory tensile testing machine with two modes for mechanical property testing of soft materials; the machine has been widely used in the lab for stretching and compression tests
- Generated BOM by SolidWorks for subsequent component purchasing and final assembly
- 3D printed the machine components using various materials through FDM, and SLA 3D printing techniques
- Customized the Java program of the tester to have the user-defined UI and data output via Processing
- Developed automatic data processing, calculating, and plotting program for testing data with MATLAB

Research on 3D DIW Printing of Soft Robotics

Research Assistant to Professor Xinyu Liu

- Synthesized and characterized soft material printing ink including hydrogels, silicone elastomers, etc.
- Fabricated a wearable glove and wristband for monitoring human motions and a soft pneumatic robotic gripper for grasping purposes as a demonstration of the DIW printing technique
- Collected and plotted the data for device testing. Made all the figures and completed a final research paper which was submitted to the 2022 MicroTAS conference as the first author; Submitting the full manuscript to RA-L 2022

COURSE PROJECTS

University of Toronto	Toronto, Canada
Autonomous Rover, Mechatronics	Sept 2022
<ul style="list-style-type: none"> • Designed and build an autonomous rover to go through a maze and payload pickup and transport • Assembled the robot to achieve the main tasks of obstacle avoidance, localization and block pick-up 	
Watermark Removal, Machine Learning	Sept 2020
<ul style="list-style-type: none"> • Developed a watermark generator using Python • Designed a Convolutional AutoEncoder using PyTorch to remove watermarks with 0.01 final loss 	
CNC Milling Machine, Mechanical Design	Sept 2019
<ul style="list-style-type: none"> • Designed a desktop CNC milling machine from scratch using SolidWorks • Created a 30-Page technical report with a team of five 	

WORK EXPERIENCE

ABB Engineering Ltd.	Shanghai, China
<i>Testing Engineer Intern</i>	May 2019 – Jul 2019
<ul style="list-style-type: none"> • Assembled robotic models using SolidWorks and documented them for engineering communication • Collected 15k data for the machine-learning model of shrimp catching project • Created tutorial documentation for the robot software • Set up Qt, ROS working environment on Linux system 	
University of Toronto (Part-time)	Toronto, Canada
<i>Hands-on Skills Workshop Facilitator</i>	Sept 2022 – April 2023
<ul style="list-style-type: none"> • Facilitating workshops and training for students in areas including, but not limited to making, tinkering, innovation, problem-based learning, design thinking, and rapid prototyping (with electronics, coding, mechanical fabrication, and wet lab work) • Creating and maintaining a public repository of tutorials on how to use the relevant equipment and materials in the various spaces safely 	

EXTRACURRICULAR ACTIVITY

University of Toronto Robotics Association (UTRA)	Toronto, Canada
<i>Mechanical Team Member</i>	Sept 2021 – Apr 2022
<ul style="list-style-type: none"> • Participated in two remote control vehicle projects; responsible for the mechanical design of main components including motors, chassis, payload, variety of sensors, etc. generated BOM, and assembled RC car 	

ADDITIONAL INFORMATION

Language Skills

- Mandarin Chinese (native); English (fluent)

Computer Skills

- Proficient in: Ps, Pr, Ai, Origin, KeyShot, AutoCAD, Fusion 260, etc.
- Programming language: MATLAB, Python, C/C++. Machine learning with PyTorch and TensorFlow
- Skilled in machining, welding, and 3D printing techniques such as FDM, SLA, DIW

Interests

- Basketball: Engineering Faculty Basketball Team Member, University of Toronto