Chengnan (Jimmy) Shentu

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Research Interests

Bridging concepts from robotics and control theory to build continuum robotic systems capable of safe and efficient interactions with humans and the environment.

EDUCATION

University of Toronto — **Toronto, Canada**
Ph.D. in in Computer Science — *Sep 2022 - Aug 2027*
Supervisor: Prof. Jessica Burgner-Kahrs

University of Toronto — **Toronto, Canada**
B.A.Sc in Engineering Science — *Sep 2017 - Apr 2022*
Robotics Engineering Major, Artificial Intelligence Minor

PUBLICATIONS

- **C. Shentu***, E. Li*, C. Chen, P. T. Dewi, D. B. Lindell, J. Burgner-Kahrs, "MoSS: Monocular Shape Sensing for Continuum Robots," *Under Review, IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2023.

EXPERIENCE

Department of Computer Science, University of Toronto | Undergraduate Thesis — **Toronto, Canada**
Supervised by Prof. Jessica Burgner-Kahrs, Continuum Robotics Lab `[website]` — *July 2021 - Apr 2022*
- Design and support the development of a moduler proprioceptive actuation unit for easier continuum robot prototyping
- Investigate and implement an impedance controller for a planar continuum robot using the actuation units, to achieve dynamic interactions with the environment while ensuring safety

Department of Computer Science and Technology, Tsinghua University | Volunteer — **Beijing, China**
Supervised by Prof. Xin Yi, Pervasive Human-Computer Interaction Group — *May 2021 - Sep 2021*
- Investigated the risk of side channel attack on head mounted consumer devices, such as VR headsets and smart-glasses, through inertial measurement unit (IMU) by recovering speech or motion information
- Developed custom driver for collecting IMU readings from discrete sensors and VR headsets such as Oculus Quest 2
- Built a training pipeline for speech recognition and speech reconstruction from collected IMU data, and evaluated performance of popular classification and natural language processing models

HiLink Integrated Circuit Lab, Huawei Canada | Application and Test Engineer Intern — **Toronto, Canada**
High-speed SerDes development, Application and Test Team — *May 2020 - Apr 2021*
- Tested serializer/deserializer (SerDes) components in high-speed integrated circuits and statistically analyzed test data
- Developed and maintained the testing environment software for fully automated tests and data logging
- Collaborated with hardware, firmware and software teams to drive test plans and debugging strategies

University of Toronto Institute of Aerospace Studies | Summer Research Student — **Toronto, Canada**
Supervised by Prof. Peter Grant, Vehicle Simulation Group — *May 2019 - Aug 2019*
- Evaluated existing aircraft stall models and parameter estimation methods through literature reviews
- Implemented mixed parameter estimation to construct a full stall aircraft model from test flight data
- Tested and compared model performance using flight and stall simulation in Matlab Simulink

HONOURS AND AWARDS

First Place in the AutoDrive Challenge | Control Team Member — *2021*
- AutoDrive is a self-driving car competition initiated by General Motors and SAE International, and eight university teams from across North America participated. `[competition website]` `[team website]`
- Development of velocity scheduler and model predictive controller with dynamic vehicle model using C++ in ROS
- Tested planning and control subsystems for safety and performance in simulation(rviz) and closed track

ESROP-UofT Fellowship — *2019*
- Awarded by Engineering Science Research Opportunities Program to pursue a paid summer research internship at the University of Toronto