

# XIAOJIAO CHEN

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## EDUCATION

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<b>The University of Hong Kong, Hong Kong</b> Ph.D. in Mechanical Engineering	<i>October 2015 - September 2019(Expected)</i>
<b>The University of Hong Kong, Hong Kong</b> M.S. in Mechanical Engineering	<i>September 2014 - August 2015</i>
<b>Huazhong University of Science and Technology, China</b> B.S. in Mechanical Engineering	<i>September 2008 - June 2012</i>

## RESEARCH EXPERIENCE

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<b>The University of Hong Kong</b> <i>Graduate Researcher</i>	October 2015 - Present <i>Hong Kong</i>
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- Designed and built a 6-DoF 3D-printed cable-driven robotic arm actuated by customized bellows.
- Designed and built a modular hybrid robot joint(HAP-Joint) with large torque and natural compliance
- Designed and built a 4-DoF carbon-fiber robotic arm based on 4 modular HAP-Joints.
- Designed and built a soft robotic arm, achieving elongation, contraction and rotation.
- Experimented to characterize pneumatic systems, such as tube pressure drop, orifice flow rate.
- Modeled and controlled the HAP-Joint in MATLAB.
- Controlled the pressure and position of HAP-Joint using PID, sliding mode and feedback linearization.
- Controlled the stiffness and interaction behavior on HAP-Joint and an origami rotary pneumatic joint.
- Controlled a 26-DoF soft pneumatic hand intuitively by human hand through leap motion sensor.
- Developed a centralized real-time embedded platform based on STM32 for the 6-DoF pneumatic robotic arm, integrated with multiple sensor inputs, valve outputs and real-time EtherCAT communication.
- Developed an open-source scalable embedded platform based on STM32 and an accompanying software stack for general soft pneumatic robotics, presented with a user-friendly C++ interface.
- Developed an GUI based on python for the pneumatic control platform with parameter configuration, real-time curve displaying, and trajectory generation

<b>The University of Hong Kong</b> <i>Graduate Researcher</i>	September 2014 - August 2015 <i>Hong Kong</i>
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- Controlled the balancing and walking of the Atlas humanoid robot in MATLAB, including deriving the analytical inverse kinematics, maintaining landing balance, and accomplishing primitive walking.
- Controlled a step-motor based 6-DoF robotic arm to write on papers.

<b>Huazhong University of Science and Technology</b> <i>Undergraduate Researcher</i>	September 2008 - June 2012 <i>China</i>
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- Developed a GUI for status monitoring of machine tools on an ARM-Linux platform using Qt.
- Implemented the strap-down inertia navigation system in MATLAB in the national UAV competition.
- Developed a number counting system of the people inside a room in the school competition.
- Participated in the school line-following car competition, in charge of mechanical design and PID tuning.

## TECHNICAL STRENGTHS

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<b>Computer</b>	Proficient in C, Python, MATLAB, Solidworks
<b>Language</b>	English(fluent), Chinese(native)

## PUBLICATIONS

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### Journals:

1. **Xiaojiao Chen**, Yaoxin Guo, Dehao Duanmu, Jianshu Zhou, Wei Zhang and Zheng Wang, "Design and Modeling of an Extensible Soft Robotic Arm," in *IEEE Robotics and Automation Letters*, vol. PP, no. c, pp. 1–1, 2019.
2. **Xiaojiao Chen**, Juan Yi, Jing Li, Jianshu Zhou and Zheng Wang, "Soft-Actuator-Based Robotic Joint for Safe and Forceful Interaction With Controllable Impact Response," in *IEEE Robotics and Automation Letters*, vol. 3, no. 4, pp. 3505–3512, Oct. 2018.
3. Juan Yi, **Xiaojiao Chen**(Co-first author), Chaoyang Song, Jianshu Zhou, Yujia Liu, Sicong Liu, Zheng Wang, "Customizable Three-Dimensional-Printed Origami Soft Robotic Joint With Effective Behavior Shaping for Safe Interactions," in *IEEE Transactions on Robotics*, vol. 35, no. 1, pp. 114–123, Feb. 2019.
4. Juan Yi, **Xiaojiao Chen**, Chaoyang Song and Zheng Wang. "Fiber-Reinforced Origamic Robotic Actuator," in *Soft Robotics*, vol. 5, no. 1, pp. 81–92, Feb. 2017.
5. Juan Yi, **Xiaojiao Chen** and Zheng Wang, "A Three-Dimensional-Printed Soft Robotic Glove With Enhanced Ergonomics and Force Capability," in *IEEE Robotics and Automation Letters*, vol. 3, no. 1, pp. 242–248, Jan. 2018.
6. Jianshu Zhou, **Xiaojiao Chen**(Co-first author), Ukyoung Chang, Jui-Ting Lu, Lcarisse Ching Yau Leung, Yonghua Chen, Yong Hu, Zheng Wang, "A Soft-robotic Approach to Anthropomorphic Robotic Hand Dexterity," in *IEEE Access*, vol. 7, pp. 101483–101495, 2019.
7. Jianshu Zhou, Juan Yi, **Xiaojiao Chen**, Z. Liu and Zheng Wang, "BCL-13: A 13-DOF Soft Robotic Hand for Dexterous Grasping and In-Hand Manipulation," in *IEEE Robotics and Automation Letters*, vol. 3, no. 4, pp. 3379–3386, Oct. 2018.

### Conferences:

1. **Xiaojiao Chen**, Jing Peng, Jianshu Zhou, Yonghua Chen, Michael Yu Wang and Zheng Wang, "A robotic manipulator design with novel soft actuators," *2017 IEEE International Conference on Robotics and Automation (ICRA)*, Singapore, 2017, pp. 1878–1884.
2. **Xiaojiao Chen**, Tommy Hu, Chaoyang Song and Zheng Wang, "Analytical Solution to Global Dynamic Balance Control of the Acrobot," *2018 IEEE International Conference on Real-time Computing and Robotics (RCAR)*, Kandima, Maldives, 2018, pp. 405–410.
3. Jianshu Zhou, **Xiaojiao Chen**, Jing Li, Yinan Tian and Zheng Wang, "A soft robotic approach to robust and dexterous grasping," *2018 IEEE International Conference on Soft Robotics (RoboSoft)*, Livorno, 2018, pp. 412–417.
4. Jianshu Zhou, **Xiaojiao Chen**, Ukyoung Chang, Jia Pan, Wenping Wang and Zheng Wang, "Intuitive Control of Humanoid Soft-Robotic Hand BCL-13," *2018 IEEE-RAS 18th International Conference on Humanoid Robots (Humanoids)*, Beijing, China, 2018, pp. 314–319.
5. Jianshu Zhou, **Xiaojiao Chen**, Ukyoung Chang, Yunhui Liu, Yonghua Chen and Zheng Wang, "A Grasping Component Mapping Approach for Soft Robotic End-Effector Control," *2019 2nd IEEE International Conference on Soft Robotics (RoboSoft)*, Seoul, Korea (South), 2019, pp. 650–655.