

Guangwei WANG

PERSONAL DATA

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EDUCATION

~ SEP. 2018 **PhD** in ELECTROMECHANICAL ENGINEERING, **University of Macau**, Macau
AUG. 2015 Thesis: "Position and Force Control for Piezo-driven Microinjection System"
Supervisor: Prof. Qingsong Xu
JUL. 2015 **Master** degree in MECHANICAL ENGINEERING, **Guizhou University**, China
SEP. 2012 Thesis: "Design and Experiment for Intelligent Vehicle Lateral Control System"
Supervisor: Prof. Jin Zhao
JUL. 2012 **Bachelor** degree in MECHANICAL ENGINEERING, **Guizhou University**, China

RESEARCH EXPERIENCE

- **Design and Control of Fully Compliant 3-DOF Constant-Force Micropositioning Stage for Cell Microinjection with Minimal Damage**
Core Member, funded by National Natural Science Foundation of China (NSFC)
 - ★ Compensated nonlinearity of piezo actuator to perform precise motion control
 - ★ Designed Position&Force fusion controller to increase success and survival rates of cell injection
 - ★ Designed constant force mechanism to realize manipulating with constant force
 - ★ Conducted microinjection experiments for zebrafish embryos based on NI PXIe platform
- **Microforce Sensing and Control System and Its Application in Automated Bio-Micromanipulation**
Core Member, funded by Macao Science and Technology Development Fund (FDCT)
 - ★ Designed microforce sensor for cell injection
 - ★ Implemented controller on NI CRIO FPGA platform
- **Research on longitudinal and lateral control method for multiple intelligent vehicle platoon**
Core Member, funded by National Natural Science Foundation of China (NSFC)
 - ★ Designed the vehicle lateral controller based on multi-fuzzy method
 - ★ Realized vehicle lateral control based on dSPACE platform
- **Multi-model Lateral Control of Intelligent vehicle Based on Multiple Sensors**
Core Member, funded by Science Foundation of Guizhou Province
 - ★ Compared the differences of single and multiple vehicle lateral controller
 - ★ Operated AMESim&MATLAB co-simulation for trajectory tracking

PUBLICATIONS

- Journal paper

1. **Guangwei Wang** and Qingsong Xu. "Design and Precision Position/Force Control of a Piezo-Driven Microinjection System," *IEEE/ASME Transactions on Mechatronics*, vol. 22, no. 4, pp. 1744 - 1754, 2017. (SCI)
2. **Guangwei Wang** and Qingsong Xu. "Design and Development of a Piezo-Driven Microinjection System with Force Feedback," *Advanced Robotics*, vol. 31, no. 23-24, pp. 1349-1359, 2017. (SCI)
3. **Guangwei Wang** and Qingsong Xu. "Adaptive Terminal Sliding Mode Control for Motion Tracking of a Micropositioning System," *Asian Journal of Control*, vol. 20, no. 3, pp. 1241-1252, 2018. (SCI)
4. **Guangwei Wang** and Qingsong Xu. "Sliding Mode Control with Disturbance Rejection for a Piezoelectric Nanopositioning Stage," *Submitted for publication*, 2018.
5. Xiaozhi Zhang, **Guangwei Wang**, and Qingsong Xu. "Design of a Novel Compliant Gripper with Compound Constant-Force Mechanism," *Submitted for publication*, 2018.
6. **Guangwei Wang** and Jin Zhao. "Brushless DC Motor Control Using dSPACE Rapid Control Prototyping System," *Modern Manufacturing Engineering*, vol. 01, pp. 20-23, 2015.
7. Meng Tao and **Guangwei Wang**. "Parameter Optimization of a Sound Absorption Layer Based on Multi-Objective Genetic Algorithm," *Journal of Shanghai Jiaotong University*, vol. 47, no. 08, pp. 1300-1305, 2013. (EI)
8. Meng Tao and **Guangwei Wang**. "Sound Transmission Loss Measurement by Using Two-microphone Method in a Standing-wave Pipe," *Noise and Vibration Control*, vol. 35, no. 05, pp. 210-212, 2013.

- Conference paper

1. **Guangwei Wang** and Qingsong Xu. "Position and Force Switching Control of a Piezo-driven Microinjection System," in *Proceedings of the 35th Chinese Control Conference (CCC2016)*, Chengdu, China, July 27-29, 2016, (EI).
2. **Guangwei Wang** and Qingsong Xu. "LuGre Model Based Hysteresis Compensation of a Piezo-Actuated Mechanism," in *Proceedings of the 14th International Conference on Intelligent Autonomous Systems (IAS-14)*, Shanghai, China, July 3-7, 2016, (EI).
3. **Guangwei Wang** and Qingsong Xu. "FPGA Based Adaptive Sliding Mode Control of a Piezoelectric-Driven Micropositioning System," in *Proceedings of the 7th IEEE International Conference on Cyber Technology in Automation, Control, and Intelligent Systems (IEEE-CYBER 2017)*, Hawaii, USA, July 31-August 4, 2017, (EI).
4. **Guangwei Wang** and Qingsong Xu. "Sliding Mode Control with Disturbance Rejection for Piezoelectric Nanopositioning Control," in *Proceedings of the 2018 American Control Conference (ACC 2018)*, Milwaukee, Wisconsin, USA, June 27-29, 2018, (EI).
5. **Guangwei Wang** and Jin Zhao. "Multi-model fuzzy controller for vehicle lane tracking," in *Proceedings of the International Conference on Intelligent Transportation Systems (ITSC 2014)*, Qingdao, China, October 8-11, 2014, (EI).

ACADEMIC ACTIVITIES

Mechanism and Machine Theory	Reviewer
IET Control Theory & Applications	Reviewer
International Journal of Advanced Robotic Systems	Reviewer

INTERESTS&SKILLS

Languages: Chinese (native), English

Interests: Robotics, Automatic Control, Autonomous Driving, Machine Learning, Anime,

Skills: Labview, Matlab, SolidWorks, CompactRIO, PXIe, dSPACE, Python, TensorFlow, ROS

AWARDS AND SCHOLARSHIPS

2015 Outstanding Graduate Student

2014 National Scholarship & Merit Student

2013 Individual Scholarship of Social Work

MOOCs

- [Robotics Software Engineer Nanodegree \(Mentor&Project Reviewer\)](#), Udacity
 - ★ Robotic arm pick & place simulation in ROS
 - ★ 3D perception and classification in ROS
 - ★ Object following using Fully Convolutional Networks
 - ★ Home service robot combined with SLAM and navigation in ROS
 - ★ Train a robot arm using deep reinforcement learning on Jeston TX2
- [Deep Learning Nanodegree](#), Udacity
 - ★ Use convolutional networks to classify images
 - ★ Use LSTM to generate new text from TV scripts
 - ★ Use DCGAN to simulate realistic image
- [Machine Learning Nanodegree](#), Udacity
 - ★ Supervised learning methods and data analysis skills
 - ★ Train a smartcab to drive using reinforcement learning
 - ★ Autonomous driving simulation with end-to-end method