# Guangwei WANG

## Personal Data

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|---|---|
| Home: | Shandong, China |
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## Education

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| ∼ 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)
  ⋆ Compensateed nonlinearity of pizeo 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