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)
  ⋆ 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