Qianqian Zhou

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Xiamen, China

Research Interests

- Decision & planning for autonomous vehicles
- Reinforcement learning for mobile robotics
- Control

Education & Academic Visiting

- **Xiamen University, Xiamen, China (985，recommended for admission)**
  Master, Computer Technology *2016.9-present*
  - Supervisors: Prof. Chih-min Lin (IEEE Fellow), Prof. Fei Chao
  - GPA: 89.4/100
  - **Ranking: 1/32**
  - Essential courses: Artificial Intelligence, Machine Learning
- **Zhengzhou University, Zhengzhou, China (211)**
  Bachelor, Telecommunication Engineering *2012.9-2016.6*
  - GPA: 3.3/4, **Major GPA: 3.7/4**
  - **Ranking: 4/98**
  - Essential courses: Principle of Communication, Digital Signal Processing

Publications

- Qianqian Zhou, Fei Chao, and Chih-Min Lin: Intelligent Wavelet Elman Fuzzy Brain Emotional Learning Control for Robotic Systems. NEURAL COMPUTING & APPLICATIONS (under review IF 4.213)
- Qianqian Zhou, Fei Chao, and Chih-Min Lin: A Functional- link-based Fuzzy Brain Emotional Learning Network for Breast Tumor Classification and Chaotic System Synchronization. International Journal of Fuzzy Systems: 1-17. 2017（IF 2.39）
- Qianqian Zhou, Chih-Min Lin, Fei Chao: Adaptive Noise Cancelation using Fuzzy Brain Emotional Learning Network, UK Workshop on Computational Intelligence, 2017

Research Experiences

- **UISEE Technology Co., Ltd:**
- *Decision and planning algorithm for autonomous car* *Beijing, 2018.4-2018.8*
  - Surveyed existing methods for autonomous driving decision and planning
  - Adopted gap model to decide whether lane changing is allowed[1] (simulation in Udacity Self-Driving Car Simulator)
    - **Advantage:** model is stable and simple
    - **Shortcomings:** (1) Too many parameters in the model, some of them have no physical meanings. (2) Programming logic is too complicated. (3) The position and speed of cars in the simulator are random.
  - Developed simulation environment in Matlab
  - Adopted Finite State Machine for lane change decision
    - **Advantages:** (1) The simulation environment in Matlab allows me to test my method under specific conditions. (2)Parameters can be determined through physical meanings.

- ✧ **Shortcomings:** (1) Cost functions are hard to determine. (2) This method is unstable under some specific conditions.

- **Xiamen University:** *Xiamen, 2017.1-present*

➢ *National Natural Science Foundation Project – Development of fuzzy brain emotional learning (FBEL) neural networks and application on control, classification and adaptive filtering systems.*
  - o Developed modified FBEL networks for robot trajectory tracking in ROS and Rviz.
  - o Developed Functional-link-based FEBL for breast tumor classification and chaotic system synchronization

➢ Project – *End-to-end robot path planning based on deep reinforcement learning:*
  - o Simulated end-to-end robot path planning on ROS and V-rep using Deep Q-learning Network.
    - ✧ **Problem:** The error did not converge after days of training.
    - ✧ **Solution:** Surveyed related papers, clipped input images, designed suitable reward function.

➢ General – *Attended recurrent reading groups about deep learning and reinforcement learning.*

- **Zhejiang University:** *Hangzhou, 2015.8-2015.11*

➢ Project – Applied adaptive membership function fuzzy control system to the control of bridge crane. (Prof. Ning Wang)

- **Zhengzhou University:** *Zhengzhou, 2013.7-2014.10*

➢ Project – *Bluetooth controlled robot car using Arduino:* developed an Android app to control a robot car using Arduino through control panel and voice.

➢ Competition – China RoboCup Robot Competition: developed anti-robot microcontrollers to control robot chassis and arms.

Skills & Knowledge

- ✧ Familiar with classic deep reinforcement learning neural network (DQN, DDPG, A3C).
- ✧ Experienced with basic path searching methods, including A*, hybrid A* and RRT.
- ✧ General understanding of autonomous driving technology, including perception, decision and control.
- ✧ Experienced with robotic simulation software including ROS, Gazebo, Rviz, V-rep and deep learning framework Tensorflow.
- ✧ Programming experience with Arduino and AVR microprocessor boards.
- ✧ Python, C++, MATLAB

Honors & Awards

Graduate National Scholarship *2017.10*

School-level scholarship *2014-2015*

Second prize of China RoboCup Robot Competition *2014.8*

[1]Hidas, P. (2005). Modelling vehicle interactions in microscopic simulation of merging and weaving. *Transportation Research Part C: Emerging Technologies*, *13* (1), 37–62.