

# Renzong Lian

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## EDUCATION

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### Beijing Institute of Technology

Beijing, China

Master of Science in Mechanical Engineering

Sept. 2018-Present

- Instructors: Prof. Huachun Tan (Southeast University), Prof. Hongwen He, Dr. Yuankai Wu
- Research interest: Reinforcement Learning, Transfer Learning, Hybrid Electric Vehicle, Energy Management

### Fuzhou University

Fuzhou, China

Bachelor of Engineering in Vehicle Engineering

Sept. 2013-July 2017

- Instructor: Dr. Dingqi Xue
- Bachelor thesis: The frame of racing car produced by robotic MIG welding
- Overall GPA: 2.96/5 (79.2/100), Ranking: 24/64

### Awards & Honors:

- **National Scholarship**, Ministry of Education of the People's Republic of China, 2020
- **Excellent Graduate Student**, Beijing Institute of Technology, 2020
- **Second Prize in China College Students 'Internet+' Innovation and Entrepreneurship Competition**, Beijing Municipal Education Commission, 2020.
- **Excellent Thesis**, Fuzhou University. 2017
- **Second Prize in Cost and Manufacture Event of 2016 Formula Student China Competition**, Society of Automotive Engineers of China. 2016
- **Second Prize in Mechanical Innovation Competition of Fujian Province**, Fujian Educational Bureau. 2015

## PUBLICATIONS

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- [R. Lian, J. Peng, Y. Wu, H. Tan, and H. Zhang, "Rule-interposing deep reinforcement learning based energy management strategy for power-split hybrid electric vehicle," Energy, vol. 197, p. 117297, 2020.](#) (Open source code: <https://github.com/lryz0612/DRL-Energy-Management>)

- [R. Lian, H. Tan, J. Peng, Q. Li, Y. Wu, "Cross-type transfer for deep reinforcement learning based hybrid electric vehicle energy management," IEEE Transactions on Vehicular Technology, 2020.](#)  
(Open source code: [https://github.com/lryz0612/Transfer\\_DRL\\_EMS](https://github.com/lryz0612/Transfer_DRL_EMS))
- H. He, Y. Wang, J. Li, J. Dou, **R. Lian**, "Intelligent energy management of the hybrid electric vehicles based on deep reinforcement learning under the cyber-physical framework," IEEE Transactions on Transportation Electrification, 2020. (Under review)

## **PROJECT EXPERIENCE**

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**Multi Tensor Network Theory and Empirical Research for High Dimensional and Multi-Source Coupled Big Data** **Beijing, China**

**National Natural Science Foundation of China (Grant No.61620106002)**

Master Student, Beijing Institute of Technology Sept. 2018-Present

Advisor: Prof. Huachun Tan, School of Transportation Engineering, Southeast University

- Research on energy management strategy of new energy vehicles based on the coupling structure of human, traffic and environmental data

**Research on Energy Management Strategy of Plug-In Hybrid Electric Vehicle based on Deep Reinforcement Learning** **Beijing, China**

**China Postdoctoral Science Foundation (Grant No. 2016M600933)**

Master Student, Beijing Institute of Technology Sept. 2018-Oct. 2019

Advisor: Dr. Jiankun Peng, School of Mechanical Engineering, Beijing Institute of Technology

- Research on the representation of multi-source and high dimensional driving cycles
- Introduced a deep reinforcement learning framework with continuous space and action representations

**China College Students 'Internet+' Innovation and Entrepreneurship Competition: AI Power--end-to-end vehicle intelligent system** **Beijing, China**

Team member, Beijing Institute of Technology May 2020-Sept. 2020

- Intelligent energy management system
- One-stop technical service for autonomous vehicle

**"Intel Cup" The First China Graduate Artificial Intelligence Innovation Competition: Intelligent energy management system of new energy vehicles** **Beijing, China**

Team member, Beijing Institute of Technology

May 2019-Aug. 2019

- Combined with multi-source and high-dimensional information such as traffic data and vehicle state, a stable and efficient energy management method for hybrid electric vehicles is realized.
- Transfer learning is utilized to realize the knowledge transfer between different types of hybrid electric vehicle energy management strategies and shorten the EMS development cycle.
- The feasibility and performance of continuous deep reinforcement learning is verified through the hardware-in-the-loop platform.

### **Formula Student China Competition**

**Fuzhou, China**

Team Leader, Fuzhou University

Jan. 2015-Dec. 2016

Advisor: Prof. Yuhui Peng, School of Mechanical Engineering and Automation, Fuzhou University

- Designed and manufactured the frame of formula car, and realized the arrangement of chassis system
- Analyzed the mechanical characteristics of automobile components, and optimized their topology structure and parameters by finite element method

### **Student Research Training Program**

**Fuzhou, China**

Project leader, Fuzhou University

May 2016-May 2017

Advisor: Dr. Dingqi Xue, School of Mechanical Engineering and Automation, Fuzhou University

- Applied robot welding technique on the manufacture of automobile components, and analyzed the mechanical properties of welding coupon.

### **Mechanical Innovation Competition of Fujian Province**

**Fuzhou, China**

Project leader, Fuzhou University

Oct. 2014-May 2015

Advisor: Prof. Xiezhao Lin, School of Mechanical Engineering and Automation, Fuzhou University

- Designed an automatic unpacking and discharging device

## **ACADEMIC ACTIVITIES**

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**International Conference on Applied Energy**

August 12-16, 2019, Västerås, Sweden

Oral Presentation

- Deep reinforcement learning based energy management of hybrid electric vehicle with expert knowledge

## **Reviewer of IEEE Transactions on Industrial Informatics**

- Intelligent control of hybrid electric vehicles

## **SKILLS**

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- Programming: Python
- Tools: TensorFlow, MATLAB, Sumo, Latex, AutoCAD, Solidworks, ANSYS