Zhengwei Bai

Curriculum Vitae

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Education

2020–Current **Ph.D. in Electrical and Computer Engineering**, *University of California Riverside*, U.S.
GPA – 4.00/4.00

2017–2020 **M.S. in Electronics Information and Engineering**, *Beijing Jiaotong University*, China.
GPA – 3.70/4.00

2013–2017 **B.E. in Electronics Information and Engineering**, *Beijing Jiaotong University*, China.
GPA – 3.61/4.00

Experience

Sep 2021 – Current **Graduate Student Researcher**, *UCR*, Center for Environmental Research and Technology.
- Developed Game Engine-based autonomous driving simulators.
- Conducted researches for Computer Vision, e.g., 3D object detection, tracking and reconstruction.

Sep 2021 – Current **Graduate Teaching Assistant**, *UCR*, Electrical and Computer Engineering.
- Leading the *Discussion Session* for *Signal and System (EE110A)*
- Handling homework, examinations, Q&A after class, etc.

Jun 2019 – Aug 2019 **Summer Intern**, *UC, Riverside*.
- Developed a reinforcement learning simulator by using **Unity3D** and **Tensorflow**.
- Proposed a Eco-Driving Approach for CAVs under signalized intersections with mixed traffic.

Publications

Currently I have published 7 papers with 39 total citations and have an h-index of 3 (Google Scholar). Below are publications of mine.

2022 [C5] **Z. Bai**, G. Wu, X. Qi, Y. Liu, K. Oguchi, M. J. Barth, "Infrastructure-Based Object Detection and Tracking for Cooperative Driving Automation: A Survey," *arXiv preprint arXiv:2201.11871* (2022).

[C4] **Z. Bai**, G. Wu, X. Qi, K. Oguchi, M. J. Barth, "Cyber Mobility Mirror for Enabling Cooperative Driving Automation: A Co-Simulation Platform," *The 101st Annual Meeting for Transportation Research Board (TRB2022)* (2022).

[J1] **Z. Bai**, P. Hao, W. Shangguan, B. Cai and M. J. Barth, "Hybrid Reinforcement Learning-Based Eco-Driving Strategy for Connected and Automated Vehicles at Signalized Intersections," in *IEEE Transactions on Intelligent Transportation Systems*, doi: 10.1109/TITS.2022.3145798.

2020 [R1] P. Hao, Z. Wei, **Z. Bai**, M. J. Barth, "Developing an Adaptive Strategy for Connected Eco-Driving Under Uncertain Traffic and Signal Conditions (No. NCST-UCR-RR-20-03)," *National Center for Sustainable Transportation*, (2020).

[C3] **Z. Bai**, P. Hao, M. J. Barth, "Hybrid Reinforcement Learning for Multi-Sensor Based Connected Eco-Driving at Signalized Intersections," *The 99th Annual Meeting for Transportation Research Board (TRB2020)* (2020).

2019 [C2] **Z. Bai**, W. Shangguan, B. Cai and L. Chai, "Deep Reinforcement Learning Based High-level Driving Behavior Decision-making Model in Heterogeneous Traffic," *2019 Chinese Control Conference (CCC), 2019*, pp. 8600-8605, doi: 10.23919/ChiCC.2019.8866005..

2018 [C1] **Z. Bai**, B. Cai, W. ShangGuan and L. Chai, "Deep Learning Based Motion Planning For Autonomous Vehicle Using Spatiotemporal LSTM Network," *2018 Chinese Automation Congress (CAC)*, 2018, pp. 1610-1614, doi: 10.1109/CAC.2018.8623233..

Research

2020–Current **Computer Vision for Cooperative Driving Automation**, *TSR Group at CE-CERT*, University of California, Riveside.

Our study is mainly on the object perception tasks for enabling cooperative driving automation (CDA) applications. My research topics focus on multi-sensor-based cooperative perception for 3D object detection, tracking and reconstruction.

- Deep learning-based 3D object perception [C4][C5].
- Multi-node multi-sensor cooperative perception [C5].
- CARLA-based co-simulation design and Dataset generation [C4].

2019–2020 **Eco-Driving for Connected and Automated Vehicles**, *TSR Group at CE-CERT*, University of California, Riveside.

My research topics focus on deep reinforcement learning-based Eco-Driving Strategies for Connected and Automated Vehicle under the mixed traffic at signalized intersections [C3][J1][R1].

2016–2020 **Motion Planning and Decision Making for Autonomous Driving**, *GNSS&ITS Lab.*, Beijing Jiaotong University.

My research focused on Machine Learning-based motion planning and decision-making methods for Autonomous Driving and the development of Game Engine-based simulation [C1][C2].

Awards and Honors

2021 **Honorable Mention**, *ASCE T&DI Artificial Intelligence Student Competition*

2020 **Dean's Distinguished Fellowship**, *University of California, Riverside*

2018 **The First Prize Scholarship**, *Beijing Jiaotong University*

2018 **The Second Prize Award**, *BJTU Graduate Academic Culture Festival Essay Competition*

2016 **The First Prize Award**, *"Nokia Cup" Innovation Competition Final*

2016 **The Second Prize Award**, *Beijing Electronic Design Competition Final*

2015 **China National Scholarship**, *Ministry of Education of the P. R. China*

2015 **Excellent Student Cadre Scholarship**, *Beijing Jiaotong University*

Skills

Coding Python, Matlab, C/C++, Java, LaTeX

Frameworks MMDetection3D, PyTorch, Keras, Tensorflow

Web HTML/CSS, JavaScript

Embedded STM32, MSP430, C51

Language English, Chinese

MISC.

2018–Current **Presentations**, *TRB2022, CCC2019, CAC2018*

2018–Current **Conference and Journal Reviewer**, *T-ITS, TRR, TRB, CCC, CAC.*

2015–2016 **Student Secretary**, *The School League general branch, BJTU*

2014–2015 **Deputy Director**, *The College Youth League Committee, BJTU*

Nov. 2014 **Student Volunteer**, *The 2014 APEC Youth Program*