

# XIANG GUO

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## 🎓 EDUCATION

**University of Virginia (UVa)**, Charlottesville, VA, USA 2017 – Present

*Ph.D student* in Systems and Information Engineering (SIE) (GPA:3.88)

**Beihang University (BUAA)**, Beijing, China 2014 – 2017

*M.S. in Transportation Engineering* (GPA:3.50)

**Beihang University (BUAA)**, Beijing, China 2010 – 2014

*B.S. in Transportation Engineering* (GPA:3.31)

## 🔍 RESEARCH INTERESTS

- Human factors, Human-machine interaction, Virtual Reality
- Driver Behavior Analysis, Driving Simulation, Pedestrians and Cyclists' safety, Music Emotion Study
- Data Analysis, Machine Learning Applications in Human modeling

## 📖 PUBLICATIONS

1. **Guo, X.**, Jiang, Y., & Kim, I. (2020, April). Interacting with Autonomous Platoons: Human Driver's Adaptive Behaviors in Planned Lane Changes. In *2020 Systems and Information Engineering Design Symposium (SIEDS)* (pp. 1-5). IEEE.
2. **Guo, X.**, Cui, L., Park, B., Ding, W., Lockhart, M., & Kim, I. (2019). How Will Humans Cut Through Automated Vehicle Platoons in Mixed Traffic Environments? A Simulation Study of Drivers' Gaze Behaviors Based on the Dynamic Areas of Interest. In *Systems Engineering in Context* (pp. 691-701). Springer, Cham.
3. **Guo, X.**, Wang, Y., Zhang, J., & Zhou, F. (2017). Application and development of Detection Response Task (DRT) in driver cognitive workload research, *Chinese Journal of Ergonomics*, 23(1), (pp. 73-77).
4. Wang, Y., **Guo, X.**, Zhu, Y., & Zhang, J. (2016, September). Color Block Task: A New Surrogate Secondary Task to Measure the Impact of Drivers' Incrementally Increased Workload. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 60, No. 1, pp. 1889-1893). Sage CA: Los Angeles, CA: SAGE Publications.
5. Zhu, Y., Wang, Y., Li, G., & **Guo, X.** (2016, October). Recognizing and Releasing Drivers' Negative Emotions by Using Music: Evidence from Driver Anger. In *Adjunct Proceedings of the 8th International Conference on Automotive User Interfaces and Interactive Vehicular Applications* (pp. 173-178).
6. Wang, Y., Zhu, J., Zheng, T., Gao, F., & **Guo, X.** (2015). Comparing Three Smart Device Setups for the Use of Speech Interface in Destination Search while Driving. *Transportation Research Board 94th Annual Meeting* (No. 15-0469).
7. Wang, Y., Liu, R., Jiang, Z., Zhu, J., & **Guo, X.** (2014). Using Behavior and Human Machine Interaction Safety of In-vehicle Smart Terminals, *Industrial Engineering and management* 19(3), pp.141-146.

## 🚢 RESEARCH EXPERIENCES

*Graduate Research Assistant*

May. 2019 – Present

*University of Virginia, VA, USA*

Advisor: Arsalan Heydarian

- **Vulnerable road users' safety** Virtual Reality and Real Road study on pedestrians and cyclists to assess their patterns of perception and reaction in certain contextual settings to enhance the safety of the whole traffic system.
- **Driver in the Loop** Collaborate on a longitudinal naturalistic driving studies to building models to predict driver behavior, and emotional changes in response to different environmental conditions. Data includes

videos from both outside and inside the car, physiological data of the driver, audio data from both music players and environment.

- **Living Link Lab** Long-term studies of occupant behavior, cognition, and interactions in a large collaborative environment while monitoring the changes in environmental factors at the University of Virginia (UVA) Cyber-Physical Systems laboratory (Link Lab), work on users' music and emotion data (video and questionnaire).

*Graduate Research Assistant*

Aug. 2017 – May. 2019

*University of Virginia, VA, USA*

Advisor: Inki Kim

- Driving simulation research on human driving behavior(vehicle dynamics, eye tracking and physiological analysis) when cutting through automated vehicle platoons in mixed traffic environments
- Deep learning application in eye tracking videos to automatically detect areas of interest (AOIs); Data-driven methods to build up the lane-change modeling for human drivers

*Research Assistant*

Sep. 2014 – Mar. 2017

*Beihang University, Beijing, China*

Advisor: Ying Wang and Guangquan Lu

- Build safety evaluation model for the transition from automated to manual driving considering the Human-vehicle-road loop by driver performance analysis (driving, eye-tracking, physiological), apply 10 different machine learning models to evaluate the quality and safety of the control authority transition process of autonomous vehicles.
- Build the driving simulation and the data collecting systems(eye tracking and physiological devices) from scratch, make visual and cognitive Detection Response Task (DRT) prototype system for secondary task test in driving experiment
- Design a new surrogate secondary task to measure the impact of drivers' incrementally increased workload, sponsored by the National Natural Science Foundation of China

*Undergraduate thesis*

Sep. 2013 – Jun. 2014

*Beihang University, Beijing, China*

Advisor: Ying Wang

- Traffic Environment Simulation and Safety evaluation for Hong Kong-Zhuhai-Macao Bridge with complex road environment (oversea bridge, undersea tunnel and roundabout), project from the Research Institute of Highway, Ministry of Transport, China

*Student Research Training Plan (SRTP)*

May. 2013 – Apr. 2014

*Beihang University, Beijing, China*

Advisor: Ying Wang

- Design and development of a Driving under the influence (DUI) state self-detection mobile application ('Android BAC Calc.apk') in Android mobile system, *DownloadLink*

## 📖 TEACHING EXPERIENCES

*Department of Engineering Systems and Environment, UVA.*

Charlottesville, VA, USA

*Teaching Assistant, SYS 4021/6021 - Linear Statistical Models*

2019 Fall, 2020 Fall

*Teaching Assistant, SYS 3023/6007 - Human-Machine Interface*

2020 Spring

*Beihang University*

Beijing, China

*Lecturer, Engineering Drawing, School of Continuing Education*

2016 Spring

*Teaching Assistant, Transportation Planning, School of Transportation Science and Engineering*

2015 Spring

## ★ HONORS AND AWARDS

**Graduate Research Assistant scholarship** from *University of Virginia*

2017 – Present

**Graduation with honor:** College Graduate Excellence Award of Beijing(top 3 in the department)

2017

**The 2nd Prize**, graduate student Scholarship from *Beihang University*

2015 – 2017

**National Inspirational Scholarship for College Students** from *Beihang University*

2013 – 2014

## WORKING EXPERIENCES

Engineer in *SAIC Motor, Shanghai, China* Apr. 2017 – Jul. 2017

- SAIC Motor Corporation Limited (SAIC Motor) is the largest auto company on China's A-share market.
- Responsible for Data processing for autonomous vehicle test in Advanced Technology Department Competition and analysis for advanced driving assistance system

Product Intern in *Tusimple Technology Co., Ltd, Beijing, China* Feb. 2016 – Jul. 2016

- Tusimple is an Artificial Intelligence company on the cutting edge of the autonomous trucking industry
- Responsible for Market research, test standard for product preparation, also involve in the data gathering and processing

Safety Evaluation Intern Engineer in *Research Institute of Highway(RIOH) Ministry of Transport*  
Beijing, China Dec.2013 – May.2014

- RIOH is the sole national level research institute in the transportation area in China.
- Traffic Scenario Simulation for The Hong Kong–Zhuhai–Macau Bridge (HZMB) project; Traffic sign design improvement for several projects

## PRESENTATIONS

- "Interacting with Autonomous Platoons: Human Driver's Adaptive Behaviors in Planned Lane Changes" in 2020 Systems and Information Engineering Design Symposium (Virtual), Apr.30, 2020
- "Emotion Analysis in Human-centered Systems from Music Perspective- Application in Smart Buildings" in Doctoral Colloquium of the 6th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys 2019), New York, Nov. 10, 2019
- "Driving through Automated Vehicle Platoons with Different Time Headway: A Preliminary Study on Human Drivers' Gaze Behavior at Dynamic Area of Interest" in the 16th Annual Conference on Systems Engineering Research, Virginia, USA, May.8, 2018
- "The Effect of Three Visual and Cognitive Secondary Tasks on Improving Drivers' Take-over Performance in Automated Driving" in the 2016 National Postgraduate Student Forum on Industrial Engineering, Beijing, China, Dec.10, 2016
- "Drivers' Take-over Performance in Automated Driving under Different Visual and Cognitive Workload" in the International Traffic Medicine Association (ITMA) 25th World Congress, Beijing, China, Sep.24, 2016
- "The application and development of wearable device in driver assistance", in the 2014 National Postgraduate Student Forum on Industrial Engineering, Beijing, China, Nov.22, 2014

## MEMBERSHIP AND COMMUNITY SERVICE

The Human Factors and Ergonomics Society(HFES) Membership	2017 – Present
HFES Student Chapter at UVa	2018 – Present
Registered member of Beijing volunteer, NO: 110114100417295	2011 – Present
Informal Asia-Pacific Economic Cooperation (APEC) Economic Leaders' Meetings	2014
The 12th China International Chorus Festival (CICF)	2014
The 9th China International Garden EXPO	2013
The 60th Anniversary of Beihang University	2012
The 11th China International Chorus Festival (CICF)	2012

## SKILLS

- Programming Languages: Proficient in Python(including Pandas/Numpy/Tensorflow/Keras/sklearn) and R, intermediate level in Matlab and C#, basic skill in C and Java
- Statistics: SPSS, Minitab
- Simulations: Unity, HTC VIVE Virtual Reality, Microsoft HoloLens 2 Augmented Reality, UC/win-road, TransCAD, Paramics, VisSim, CarSim, TransCAD
- Mechanical Engineering Tools: Solidworks, AutoCAD, Ansys, ADAMS

- Physiological measurement: SmartEye/SMI/Tobii/Hololens Eye tracking system, Biopac/Biograph physiological system
- Others: Design of Experiment(DoE), Microsoft Office, Latex, Photoshop