

# Jianwu Fang      Ph.D.

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**Current Position**      **Associate Professor**  
Department of Big data management and Application,  
College of Transportation Engineering  
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**Google Scholar**      <https://scholar.google.com/citations?user=hr8eDYsAAAAJ&hl=zh-CN&oi=ao>

## Research Interests

Big Vision Data Processing, Artificial Intelligence, Traffic Vision Safety Research

## Education

**2012-2015**    Ph.D. in Signal and Information Processing  
**University of Chinese Academy of Sciences**, Beijing, China  
Dissertation: *Object Motion Analysis in Muti-source Imagery Videos*  
Advisor: Prof. Yuan Yuan

**2009-2012**    M.S. in Traffic Information Engineering and Control  
**Chang'an University**, Xi'an, China  
Thesis: *Single Object Tracking in Complex Scenes*  
Advisor: Prof. Hongke Xu

**2005-2009**    B.S. in Automation - **Chang'an University**, Xi'an, China

## Professional Experience

**2015 July** - Chang'an University (CHD)  
**Present**      *Associate Professor*  
I am the founding director of the Lab Of Traffic Vision Safety Research (LOTVS) at CHD.

**2016 Oct.** - Institute of Artificial Intelligence and Robotics (IAIR), Xian Jiaotong University (XJTU)

**2019 Dec.**    *Post Doctorial Researcher, Co-advisor: Proc. Jianru Xue*  
Research and Traffic scene understanding, driver attention prediction.

## Publications

Top-tier conferences and journals: AAAI: 2, ICRA: 3, TCYB: 1; TIE: 1, TCSVT: 3, TMM: 1, CVIU: 1, Neurocomputing: 4

Underline indicates a student paper advised by me and \* shows the corresponding author. † indicates the co-first author.

### Manuscripts under Review

1. Rixing Zhu, **Jianwu Fang\***, Jinjun Wang, Hongkai Yu, Hongke Xu, and Jianru Xue. Complementary Multi-Order Cross-Distance Learning for Vehicle Re-Identification. *IEEE Transactions on Intelligent Transportation Systems (TITS)*, submitted, 2020. (impact factor: 6.319) (under review)
- Shaoyue Song, Zhenjiang Miao Hongkai Yu, **Jianwu Fang**, Kang Zheng, Cong Ma, and Song Wang, Deep Domain Adaptation Based Multi-spectral Salient Object Detection. *IEEE Transactions on Multimedia (TMM)*, Minor revision, 2020. (impact factor: 6.051) (under review)

2. **Jianwu Fang\***, Dingxin Yan, Jiahuan Qiao, and Jianru Xue. DADA: Driver Attention Prediction in Accidental Scenarios. *IEEE Transactions on Intelligent Transportation Systems (TITS)*, re-submitted after Major revision, 2020. (impact factor: 6.319) (under review)

## Journal

1. Sen Li, **Jianwu Fang\***, Hongke Xu, and Jianru Xue. Video Frame Prediction by Deep Multi-branch Mask Network. *IEEE Transactions on Circuit Systems for Video Technology (TCSVT)*, 2019. (impact factor: 4.133)
2. Hongkai Yu, Kang Zheng, **Jianwu Fang**, Hao Guo, and Song Wang. A New Method and Benchmark for Detecting Co-Saliency within a Single Image. *IEEE Transactions on Multimedia (TMM)*, 2019. (impact factor: 6.051)
3. Rixing Zhu, **Jianwu Fang\***, Shiyong Li, Qi Wang, Hongke Xu, Jianru Xue, and Hongkai Yu. Vehicle Re-identification in Tunnel Scenes via Synergistically Cascade Forests. *Neurocomputing*, 2019. (impact factor: 4.438)
4. Fei Wang, Wei Wang, Zhiliang Qiu, **Jianwu Fang\***, Jianru Xue, and Jingru Zhang. Color Constancy via Multi-branch Probability Network. *Journal of Electronic Imaging (JEI)*, 2018. (impact factor: 0.924)
5. **Jianwu Fang** and Jianru Xue\*. Tunnel Brightness Compensation with Spatial-Temporal Visual-Content Preservation. *IEEE Transactions on Industrial Electronics (TIE)*, 2018. (impact factor: 7.53)
6. **Jianwu Fang**, Hongke Xu, Qi Wang\*, and Tianjun Wu. Online Hash Tracking with Spatio-temporal Saliency Auxiliary. *Computer Vision and Image Understanding (CVIU)*, 2017. (impact factor: 3.121)
7. Yuan Yuan, **Jianwu Fang**, and Qi Wang\*. Incrementally Perceiving Hazards in Driving. *Neurocomputing*, 2018. (impact factor: 4.438)
8. Tianjun Wu, Jiancheng Luo, **Jianwu Fang**, Jianghong Ma, and Xueli Song. Unsupervised Change Detection using High-resolution Remote Sensing Images via A Weibull Mixture Model-Based Binarization. *IEEE Geoscience and Remote Sensing Letters (IEEE-GRSL)*, 2017. (impact factor: 3.833)
9. Jianru Xue, **Jianwu Fang\***, and Pu Zhang. A Survey of Scene Understanding by Event Reasoning in Autonomous Driving, *International Journal of Automation and Computing (IJAC)*, 2018. (Hot paper in 2019)
10. Li Zhou, Yongfeng Ju, **Jianwu Fang\***, and Jianru Xue. Saliency Detection via Background Invariance in Scale Space. *Journal of Electronic Imaging (JEI)*, 2016. (impact factor: 0.924)
11. Yuan Yuan, **Jianwu Fang**, Qi Wang. Online Anomaly Detection in Crowded Scenes via Structure Analysis. *IEEE Transactions on Cybernetics (TCYB)*, 2015. (impact factor: 11.079)
12. Qi Wang, **Jianwu Fang**, and Yuan Yuan. Adaptive Road Detection via Context-aware Label Transfer. *Neurocomputing*, 2015. (impact factor: 4.438)
13. **Jianwu Fang**, Qi Wang, Yuan Yuan. Part-based Online Tracking with Geometry Constraint and Attention Selection. *IEEE Transactions on Circuit Systems for Video Technology (TCSVT)*, 2014. (impact factor: 4.133)
14. Yuan Yuan, **Jianwu Fang**, Qi Wang. Robust Superpixel Tracking via Depth Fusion. *IEEE Transactions on Circuit Systems for Video Technology (TCSVT)*, 2014. (impact factor: 4.133)
15. Qi Wang, **Jianwu Fang**, Yuan Yuan. Multi-cue Based Tracking. *Neurocomputing*, 2014. (impact factor: 4.438)

## Conference

1. Xingyu Chen, Jianru Xue, **Jianwu Fang**, and Yuxin Pan. Using Detection, Tracking and Prediction to Achieve Real-time Visual SLAM in Dynamic Environments. *Proceedings of IEEE Intelligent Vehicles Symposium (IV)*, Las Vegas, Nevada, USA, 2020.

2. Zhen Ye, Jianru Xue, Jian Dou, Yuxin Pan, **Jianwu Fang**, Di Wang, Improving 3D Object Detection via Joint Attribute-oriented 3D Loss. *Proceedings of IEEE Intelligent Vehicles Symposium (IV)*, 2020, Las Vegas, Nevada, USA, 2020.
3. Yuxin Pan, Jianru Xue, Pengfei Zhang, Wanli Ouyang, **Jianwu Fang**, and Xingyu Chen. Navigation Command Matching for Vision-based Autonomous Driving. *Proceedings of International Conference on Robotics and Automation (ICRA)*, Paris, France, 2020.
4. Shaoyue Song, Hongkai Yu, Zhenjiang Miao, **Jianwu Fang**, Kang Zheng, Cong Ma, Song Wang. Multi-spectral Salient Object Detection by Adversarial Domain Adaptation. *AAAI Conference on Artificial Intelligence (AAAI)*, New York, NY, 2020.
5. **Jianwu Fang**, Dingxin Yan, Jiahuan Qiao, Jianru Xue, He Wang and Sen Li. DADA-2000: Can Driving Accident be Predicted by Driver Attention? Analyzed by A Benchmark. *Proceedings of 2019 22nd IEEE Intelligent Transportation Systems Conference (ITSC)*, Auckland, New Zealand, 2019.
6. Zijie Wang, **Jianwu Fang\***, Jian Dou, and Jianru Xue. Small Object Detection on Road by Embedding Focal-Area Loss. *Proceedings of 10th International Conference on Image and Graphics (ICIG)*, Beijing, China, 2019.
7. Jianru Xue, **Jianwu Fang**, Tao Li, Bohua Zhang, Pu Zhang, Zhen Ye and Jian Dou. BLVD: Building A Large-scale 5D Semantics Benchmark for Autonomous Driving. *Proceedings of International Conference on Robotics and Automation (ICRA)*, Montreal, Canada, 2019.
8. Jian Dou, Jianru Xue, **Jianwu Fang**. SEG-VoxelNet for 3D Vehicle Detection from RGB and LiDAR Data. *Proceedings of International Conference on Robotics and Automation (ICRA)*, Montreal, Canada, 2019.
9. Hongkai Yu, Kang Zheng, **Jianwu Fang**, Hao Guo, Wei Feng, and Song Wang. Co-saliency Detection Within a Single Image. *AAAI Conference on Artificial Intelligence (AAAI)*, New Orleans, LA, 2018.
10. **Jianwu Fang**, Zheng Li, and Jianru Xue. Spatial-Sequential-Spectral Context Awareness Tracking. *IEEE International Conference on Image Processing (ICIP)*, Beijing, China, 2017.
11. Li Zhou, **Jianwu Fang\***†, Yongfeng Ju, and Jianru Xue. Multi-Saliency Detection via Instance Specific Element Homology. *Proceedings of International Conference on Digital Image Computing: Techniques and Applications (DICTA)*, Sydney, Australia, 2017.
12. Jian Dou, **Jianwu Fang**, Tao Li, and Jianru Xue. Boosting CNN-based Pedestrian Detection via 3D LiDAR Fusion in Autonomous Driving. *Proceedings of 10th International Conference on Image and Graphics (ICIG)*, Shanghai, China, 2017.
13. Tao Li, **Jianwu Fang**, Yang Zhong, Di Wang and Jianru Xue. Online High-accurate Calibration of RGB+3D-LiDAR for Autonomous Driving. *Proceedings of 10th International Conference on Image and Graphics (ICIG)*, Shanghai, China, 2017.

## Patent

1. A System to Detect and Forewarn the Over-heated Wheel of Truck. Awarded in China, patent #: ZL201610272791.2.
2. A method of Tunnel Vehicle Re-identification based on Synergistically Cascade Forest. Awarded in China, patent #: CN109389177A.
3. An Image Classification Method based on Width Radial Basis Function Network. Awarded in China, patent #: CN110110769A.
4. A Learning Method Based on Parallel Multilevel Width Neural Network. Awarded in China, patent #: CN110110845A.
5. Driving Hazards Detection Based on Multi-source Imagery Videos. Awarded in China, patent #: CN105989614A.
6. An Online Calibration Method for 3D-LiDAR and Camera for Intelligent Vehicle. Awarded in China, patent #: CN109270534A.

## Funded Grants

As a faculty at CHD:

- 1/2017-12/2019, 'Anomaly detection for multiple heterogeneous videos via constructively high-order context learning', **National Natural Foundation of China**. Grant-61603057, ~RMB 220,000. **role: PI**
- 1/2017-12/2018, 'Vehicle Re-identification in Tunnels Scenes with Group-wise Structure Modeling and Learning', **Natural Science Foundation of Shaanxi Province**, Grant-2017JQ6041, RMB 30,000. **role: PI**
- 1/2020-12/2021, 'Driving Anomaly Prediction Guided by Driver Attention', **The Fundamental Research Funds for the Central Universities**, Grant, RMB 150,000. **role: PI**

As a Post Doctoral Researcher at XJTU:

- 01/2017-12/2018, 'Intention Prediction of Traffic Participants by Modeling the Context Evolution of Multi-source Vision Information', **Chinese Postdoctoral Science Foundation**. Grant-2017M613152, RMB 50,000. **role: PI**
- 06/2016-06/2020, 'Deep Perception of Big Vision Data', **National Key Research and Development Project**. RMB 14.46 million, **role: Key PP**
- 01/2018-12/2020, 'Human-like Understanding and Autonomous Driving in Complex Scenes', **National Natural Key Foundation of China**. RMB 2.2 million, **role: Key PP**

## Awards

- First-class Prize for "Challenging Cup" Science Competition of Shaanxi Province (China), 2011, Leader of Team.
- First-class Prize for "Challenging Cup" Science Competition of Shaanxi Province (China), 2016, Supervisor of Team.
- First-class Prize for Traffic Sign Detection in "Intelligent Vehicle Future Challenge" of Natural Science Foundation of China, 2017, Supervisor of Team.

## Students

### Co-advised Ph.D. students

Rixing Zhu, Chang'an University, Xi'an, China. (3 papers published, expected 2020)

### Advised Master students

Sen Li (expected 2020), He Wang (expected 2021), Dingxin Yan (expected 2021), Jiahuan Qiao (expected 2021), Chen Zhu (expected 2022), Yu Zhang (expected 2022), Jia Bai (expected 2023).

## Academic Services

### IEEE Member, CAA Member, CCF Member, CAAI Member

**Vice Secretary-General:** Hybrid Intelligence Committee in Chinese Association of Automation.

**Vice Secretary-General:** Xi'an Artificial Intelligence Innovation and Development Alliance.

**Youth editorial Board Member:** Journal of Unmanned System Technology (Chinese Version).

**Co-chair:** 2018 IEEE Intelligent Vehicles Symposium (IV'18) workshop on "Traffic Scene Understanding of Automated Vehicles".

**Journal Reviewers:** IEEE Transactions on Intelligent Transportation Systems (reviewed over 40 papers from 2017 to now), IEEE Transactions on Cybernetics, IEEE Transactions on Circuit Systems for Video Technology, IEEE Transactions on Industrial Informatics, etc.

**Conference PC Member or Reviewers:** Over 100 times of conference reviewing, e.g., IJCAI-PRICAI, ICRA, ITSC, ICPR, ACM-MM, BMVC, etc