

# Wei-Long Zheng

## Contact Information

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## Education

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### PhD of Computer Science and Technology (Expected Graduation in 2018)

Shanghai Jiao Tong University (SJTU) Shanghai, China (Sep.2012-Present)  
<http://bcmi.sjtu.edu.cn/>

### Visiting Student in The Cichocki Laboratory for Advanced Brain Signal Processing

Brain Science Institute, RIKEN Wako-shi, Japan (June.2016-Sept.2016)  
<http://www.bsp.brain.riken.jp/>

### Visiting Student in Intelligent Systems Group

University of the Basque Country (UPV/EHU) San Sebastian, Spain (Sep.2014-Mar.2015)  
<http://www.sc.ehu.es/ccwbayes/#home>

### Computational & Cognitive Neuroscience Summer School

Cold Spring Harbor Beijing, China (July 6-24 2013)  
[http://www.ccns.org/ccn\\_2013/](http://www.ccns.org/ccn_2013/)

### Bachelor of Information Engineering

South China University of Technology (SCUT) Guangzhou, China (Sep.2008-July2012)  
Major: Information Engineering (Talented Students Program) Cumulative GPA: 3.82/4.0(top5%)  
<http://en.scut.edu.cn/>

## Research Interest

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Affective Computing, Machine Learning, and Pattern Recognition, Brain-Computer Interface.

## Research Experience

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### Multimodal Emotion Recognition with EEG and Eye Movements (2013.9-present)

*Research Assistant. Center for Brain-like Computing and Machine Intelligence, SJTU*

- Designed and implemented algorithms based on EEG and eye movements for emotion recognition

### EOG and EEG-Based Vigilance Estimation and Prediction for Drivers (2014.9-present)

*Research Assistant. Center for Brain-like Computing and Machine Intelligence, SJTU*

- Designed and implemented algorithms based on EOG and EEG for vigilance estimation and prediction
- Designed wireless wearable EOG and EEG devices for vigilance estimation and prediction

### Personalizing EEG-based Affective Models with Transfer Learning (2015.9-present)

*Research Assistant. Center for Brain-like Computing and Machine Intelligence, SJTU*

- Designed and implemented transfer learning algorithms for EEG analysis

### 3D Reconstruction Based on Depth Camera (2012)

*Team Leader. Human-Computer Interaction Technology Innovation Center, SCUT*

- Implemented the image geometric correction algorithm.
- Completed the algorithm for Registration of Depth Image and Color Image.
- Published an international conference paper.

### Computer Vision Based Embedded Driver Fatigue Detection System (2012)

*Undergraduate Thesis. South China University of Technology SCUT*

- Established the infrared illuminating system.
- Designed and developed innovative algorithms for face/eye automatic image segmentation (color and monochromatic images) and eye status determination in condition of daylight and infrared illumination respectively.
- Designed and implemented algorithms of eye tracking in successive frames of the video for computer vision based fatigue detection.

### **Embedded QR code Recognition System Research Based on Image Processing (2011)**

*Team Leader. Human-Computer Interaction Technology Innovation Center, SCUT*

- Designed the basic frame of the system.
- Designed and completed the hardware and software of the test system.
- Designed an algorithm to recognize QR code even in the complex background.
- Designed the user interface with QT programming.
- Documented the patents.

### **Selected Publications (Total Citations: 394, h-index: 11, i10-index: 12, from [Google Scholar](#))**

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- [1] **Wei-Long Zheng**, Wei Liu, Yifei Lu, Bao-Liang Lu, and Andrzej Cichocki, EmotionMeter: A Multimodal Framework for Recognizing Human Emotions. *IEEE Transactions on Cybernetics*, 2018.
- [2] **Wei-Long Zheng** and Bao-Liang Lu, A Multimodal Approach to Estimating Vigilance Using EEG and Forehead EOG. *Journal of Neural Engineering*, 14(2): 026017, 2017.
- [3] **Wei-Long Zheng**, Jia-Yi Zhu, and Bao-Liang Lu, Identifying Stable Patterns over Time for Emotion Recognition from EEG, to appear in *IEEE Transactions on Affective Computing*, 2017.
- [4] Yimin Yang, Q. M. Jonathan Wu, **Wei-Long Zheng**, and Bao-Liang Lu, EEG-based emotion recognition using hierarchical network with subnetwork nodes, to appear in *IEEE Transactions on Cognitive and Developmental Systems*, 2017.
- [5] **Wei-Long Zheng**, and Bao-Liang Lu, Personalizing EEG-based Affective Models with Transfer Learning, in *the 25th International Joint Conference on Artificial Intelligence (IJCAI)*, 2016:2732-2738.
- [6] **Wei-Long Zheng**, Shan-Chun Shen and Bao-Liang Lu, Online Depth Image-Based Object Tracking with Sparse Representation and Object Detection, *Neural Processing Letters*, pp. 1-14, 2016.
- [7] **Wei-Long Zheng**, and Bao-Liang Lu, Investigating Critical Frequency Bands and Channels for EEG-based Emotion Recognition with Deep Neural Networks, *IEEE Transactions on Autonomous Mental Development (IEEE TAMD)*, vol. 7, no. 3, pp. 162-175, 2015. (*2017 IEEE TAMD Outstanding Paper Award*).
- [8] **Wei-Long Zheng**, Yong-Qi Zhang, Jia-Yi Zhu, and Bao-Liang Lu, Transfer Components between Subjects for EEG-based Emotion Recognition, in Proc. of the sixth *International Conference on Affective Computing and Intelligent Interaction (ACII2015)*, 2015: 917-922.
- [9] Yifei Lu\*, **Wei-Long Zheng\***, Binbin Li, and Bao-Liang Lu, Combining Eye Movements and EEG to Enhance Emotion Recognition, in Proc. of *the International Joint Conference on Artificial Intelligence (IJCAI'15)*, 2015:1170-1176. (\*contributed equally as joint first authors).
- [10] **Wei-Long Zheng**, Roberto Santana, and Bao-Liang Lu, Comparison of Classification Methods for EEG-based Emotion Recognition, in Proc. of the 2015 *World Congress on Medical Physics and Biomedical Engineering (WC'15)*. IFMBE, 2015: 1184-1187.
- [11] **Wei-Long Zheng**, Hao-Tian Guo, and Bao-Liang Lu, Revealing Critical Channels and Frequency Bands for EEG-based Emotion Recognition with Deep Belief Network, in Proc. of *the 7th International IEEE EMBS Conference on Neural Engineering (IEEE NER'15)*. IEEE, 2015: 154-157.
- [12] **Wei-Long Zheng**, Jia-Yi Zhu, Yong Peng, and Bao-Liang Lu. EEG-Based Emotion Classification Using Deep Belief Networks. 2014 *IEEE International Conference on Multimedia & Expo (ICME'14)*. IEEE, 2014: 1-6.
- [13] **Wei-Long Zheng**, Jia-Yi Zhu, and Bao-Liang Lu. Multimodal Emotion Analysis in Response to Multimedia. 2014 *IEEE International Conference on Multimedia and Expo Workshops (ICMEW'14)*. IEEE, 2014: 1-2.

- [14] **Wei-Long Zheng**, Bo-Nan Dong, and Bao-Liang Lu. Multimodal Emotion Recognition using EEG and Eye Tracking Data. 2014 *36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'14)*. IEEE, 2014: 5040-5043.
- [15] **Wei-Long Zheng**, Jia-Yi Zhu, and Bao-Liang Lu, Identifying Stable Patterns over Time for Emotion Recognition from EEG, *arXiv preprint* arXiv:1601.02197 (2016).
- [16] Yong Peng, **Wei-Long Zheng** and Bao-Liang Lu. An unsupervised discriminative extreme learning machine and its applications to data clustering. *Neurocomputing*, 2014, DOI: 10.1016/j.neucom.2014.11.097.

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## Under Review

- [1] **Wei-Long Zheng**, Kunpeng Gao, Gang Li, Wei Liu, Chao Liu, Jing-Quan Liu, Guoxing Wang, and Bao-Liang Lu, Vigilance Estimation Using a Wearable EOG Device in Real Driving Environments, submitted to *IEEE Transactions on Intelligent Transportation Systems*.

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## Patents

- "A Method and System of Robot Navigation Based on Color Coding Identification", Second Applicant, Application ID: 201210289058.3. (Issued)
- "A Method of Key Frame Recognition in Video Stream", Second Applicant, Application ID: 201210480917.7. (Issued)

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## Media Report

*MIT Technology Review* "How One Intelligent Machine Learned to Recognize Human Emotions" A View from Emerging Technology from the arXiv, January 23, 2016. [\[link\]](#)

*Medical Physics Web* IOP Publishing "Wearable device monitors driver vigilance", March 20, 2017. [\[link\]](#)

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## Scholarships & Honors

- IEEE Transactions on Autonomous Mental Development Outstanding Paper Award, IEEE CIS 2017
- Excellent Ph.D Student Scholarship of Yang Yuanqing Education Fund, Shanghai Jiao Tong University 2016
- Ruth Mulan Chu Chao Ph.D Student Scholarship, Shanghai Jiao Tong University 2016
- National Scholarship for Graduate Student, Ministry of Education, China 2015
- Graduate Academic Excellence Scholarship of Shanghai Jiao Tong University 2014
- National Scholarships Inspirational, Ministry of Education, China 2008-2009
- National Scholarships Inspirational, Ministry of Education, China 2009-2010
- Second-class scholarship in South China University of Technology 2010-2011

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## Professional Services

- Program Committee Member IJCAI 2018
- Teaching Assistant for "Neural Network Theory and Applications (F033574)", Shanghai Jiao Tong University, Spring 2015, Spring 2016, Spring 2017
- Reviewer and Sub-reviewer: IEEE Trans. Affective Computing, IEEE Trans. Cognitive and Developmental Systems, IEEE Trans. Biomedical Engineering, IEEE Trans. Neural Networks and Learning Systems, Journal of Neural Engineering, IEEE Trans. Intelligent Transportation Systems, IJCAI'18, ICONIP'16, ICONIP'15, ICONIP'14, etc.

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## References

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