

# WEIFENG LIU

College of Information and Control Engineering, China University of Petroleum (East China)

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## EDUCATION

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Doctor of Engineering, Control Science and Engineering

Thesis *Study on Facial Expression Recognition*

Supervisor Professor Zengfu Wang

University of Science and Technology of China, China, June 2007

Bachelor of Engineering, Automatic Control

Supervisor Professor Zengfu Wang

University of Science and Technology of China, China, July 2002

Bachelor of Science, Business Administration

Supervisor Professor Hui Yao

University of Science and Technology of China, China, July 2002

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## PROFESSIONAL SUMMARY

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- Rich research experience in machine learning, pattern recognition and computer vision.
- Strong record of academic publications, with over 60 papers published in top journals and conferences in the fields of pattern recognition and computer vision.
- Solid background knowledge, in applied mathematics, signal processing, image processing, for application-driven theoretical research.

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## RESEARCH INTERESTS

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- Machine Learning: multiview learning, manifold learning and sparse learning.
- Computer Vision: content based image annotation and retrieval, human behavior analysis.
- Others: application of machine learning methods to various areas, e.g. speech signal processing, large scale parallel computing, mobile computing.

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## RESEARCH EXPERIENCE

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*Professor*

Dec. 2016-Present

College of Information and Control Engineering, University of Petroleum (East China), China

- Proposed a deep architecture of Canonical Correlation Analysis (CCA) for two view image recognition.
- Proposed a large margin auto-encoder algorithm, which enforce the discriminant ability of auto-encoders.
- Proposed a generalized Hough transform for straight road detection in remote sensing images.

*Associate Professor* Dec. 2009-Dec.2016

College of Information and Control Engineering, University of Petroleum (East China), China

- Proposed a generalized version of Laplacian regularized sparse coding for human activity recognition called p-Laplacian regularized sparse coding, which exploits p-Laplacian regularization to preserve the local geometry.
- Proposed a new auto-encoder algorithm called Hessian regularized sparse auto-encoders (HSAE) and stacked the single-layer auto-encoders and form a deep architecture of HSAE.
- Proposed a general framework for co-training according to the diverse learners constructed in co-training and provided three types of co-training implementations, including co-training on multiple views, co-training on multiple classifiers, and co-training on multiple manifolds.
- Proposed multiview Hessian regularization, and exploited Hessian regularization from variant viewpoints.

*Visiting Scholar* Sep. 2011-Aug. 2012

Centre for Quantum Computation & Intelligence Systems, University of Technology, Sydney, NSW, Australia.

- Proposed multiview Hessian regularization (mHR) framework to optimally combine multiple Hessian regularizations, each of which is obtained from a particular view of instances, and steer the classification function which varies linearly along the data manifold.
- Proposed multiview Hessian discriminative sparse coding (mHDSC) which seamlessly integrates Hessian regularization with discriminative sparse coding for multiview learning problems.
- Developed parallel implementation on GPU of some machine learning algorithm e.g. sparse PCA, LASSO.

*Lecture* Jul. 2007-Dec. 2009

College of Information and Control Engineering, University of Petroleum (East China), China

- Implemented popular visual features, such as local binary patterns and Gabor filter bank, for representing face image for facial expression recognition.
- Developed a content based real-time compression of video streams with high fidelity using motion detection and zero-wavelet trees.
- Developed an object detection method using histogram feature and particle swarm optimization to robustly handle the target rotation and scales.

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## TEACHING EXPERIENCE

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*Professor* Jan. 2017-Present

College of Information and Control Engineering, University of Petroleum (East China), China

*Associate Professor*

Dec. 2009-Dec. 2016

College of Information and Control Engineering, University of Petroleum (East China), China

- Pattern Recognition, Image Processing, Optical Fiber Communication, Database System, Mobile Communication.

*Lecture*

Jul. 2007-Dec. 2009

College of Information and Control Engineering, University of Petroleum (East China), China

- Signal and System, Optical Fiber Communication, Database System, Mobile Communication.

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## SELECTED PUBLICATIONS

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1. T.-S. Chua, X. He, **W. Liu\***, M. Piccardi, Y. Wen, D. Tao, "Big Data Meets Multimedia Analytics", *Signal Processing*, 124: 1-4, 2016. (Special issue editorial)
2. Y. Guo, L. Li, **W. Liu**, J. Cheng, and D. Tao, "Multiview Cauchy Estimator Feature Embedding for Depth and Inertial Sensor-Based Human Action Recognition", *IEEE Trans. on Systems, Man, and Cybernetics: Systems*, 47(4): 617-627, 2017.
3. **W. Liu**, Z. Zha, Y. Wang, K. Lu, and D. Tao, "p-Laplacian Regularized Sparse Coding for Human Activity Recognition," *IEEE Trans. on Industrial Electronics*, 63(8): 5120-5129, 2016.
4. **W. Liu** and D. Tao, "Multiview Hessian Regularization for Image Annotation," *IEEE Trans. on Image Processing*, 22: 2676-2687, 2013.
5. D. Tao, L. Jin, **W. Liu**, and X. Li, "Hessian Regularized Support Vector Machines for Mobile Image Annotation on the Cloud". *IEEE Trans. on Multimedia*, 15(4): 833-844, 2013.
6. X. Yang, **W. Liu\***, D. Tao\*, and J. Cheng, "Canonical Correlation Analysis Networks for Two View Image Recognition", *Information Sciences*, 385-386: 338-352, 2016.
7. **W. Liu**, D. Tao, J. Cheng, and Y. Tang, "Multiview Hessian Discriminative Sparse Coding for Image Annotation," *Computer Vision and Image Understanding*, 118: 50-60, 2014.
8. **W. Liu**, H. Liu, D. Tao, Y. Wang, K. Lu, "Multiview Hessian regularized logistic regression for action recognition", *Signal Processing*, 110: 101-107, 2015.
9. **W. Liu**, T. Ma, Q. Xie, D. Tao, and J. Cheng, "LMAE: A Large Margin Auto-Encoders for Classification", *Signal Processing*, 141: 137-143, 2017
10. **W. Liu**, Z. Zhang, S. Li, and D. Tao, "Road Detection by Using a Generalized Hough Transform", *Remote Sensing*, 9(6): 590, 2017.
11. **W. Liu**, L. Zhang, D. Tao, and J. Cheng, "Reinforcement Online Learning for Emotion Prediction by Using Physiological Signals", *Pattern Recognition Letters*, 10.1016/j.patrec.2017.06.004.
12. **W. Liu**, L. Zhang, D. Tao, and J. Cheng, "Support Vector Machine Active Learning by Hessian Regularization", *Journal of Visual Communication and Image Representation*, 49: 47-56, 2017.
13. X. Yang, **W. Liu**, D. Tao, J. Cheng, and S. Li, "Multiview Canonical Correlation Analysis Networks for Remote Sensing Image Recognition," *IEEE Geoscience and Remote Sensing Letters*.

14. **W. Liu**, Y. Li, X. Lin, D. Tao, Y. Wang, "Hessian regularized co-training for social activity recognition", PLOS ONE, 9: e108474, 2014.
15. **W. Liu**, H. Liu, and D. Tao, "Hessian regularization by patch alignment framework," Neurocomputing, 204: 183-188, 2016.
16. D. Tao, X. Yang, **W. Liu\***, S. Sun, Y. Guo, Y. Yu, J. Pang, "Cauchy Estimator Discriminant Learning for RGB-D Sensor-based Scene Classification", Multimedia Tools and Applications, 76(3): 4471-4489, 2017.
17. **W. Liu**, T. Ma, D. Tao, J. You, "HSAE: A Hessian Regularized Sparse Auto-Encoders", Neurocomputing, 187: 59-65, 2016.
18. **W. Liu**, H. Zhang, D. Tao, Y. Wang, K. Lu, "Large-Scale Paralleled Sparse Principal Component Analysis", Multimedia Tools and Applications, 75(3): 1481-1493, 2016.
19. **W. Liu**, H. Liu, D. Tao, Y. Wang, K. Lu, "Manifold regularized kernel logistic regression for web image annotation", Neurocomputing, 172: 3-8, 2016.
20. **W. Liu**, Y. Li, D. Tao, and Y. Wang, "A general framework for co-training and its applications," Neurocomputing, 167: 112-121, 2015
21. H. Liu, **W. Liu\*** and Y. Wang, "Multi-view Face Analysis Based on Gabor Features," Journal of Information and Computational Science, 11(13): 4637-4644, 2014.

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## PROFESSIONAL SERVICE

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### *Membership*

- IEEE member
- IEEE SMC Society member
- ACM member
- ACM SIGMM member
- ACM SIGKDD member
- ACM SIGMM China Chapter member
- CCF member
- CCF Computer vision committee member
- APNNS member

### *Associate editor*

- Neural Processing Letters (2016.01-present)

### *Guest editor*

- Signal Processing (SI: Big Data Meets Multimedia Analytics, 2016)
- Signal Processing (SI: Data Mining in Human Activity Analysis, 2017)
- Journal of Electrical and Computer Engineering (SI: Advanced Data Representation and Learning in Multimedia Data Analysis, 2017)

### ***Committee Service***

- Co-chair of IEEE SMC TC on Cognitive Computing (2015-present)

### ***Journal reviewer***

- ACM Transactions on Knowledge Discovery from Data
- Applied Soft Computing
- Artificial Intelligence in medicine
- Cognitive Computation
- Engineering Science and Technology an International Journal
- IEEE Access, IEEE Intelligent Systems
- IEEE Transactions on Affective Computing
- IEEE Transactions on Big Data, IEEE Transactions on Computers
- IEEE Transactions on Cybernetics
- IEEE Transactions on Circuits and Systems for Video Technology
- IEEE Transactions on Emerging topics in Computational Intelligence
- IEEE Transactions on Image Processing
- IEEE Transactions on Multimedia
- IEEE Transactions on Neural Networks and Learning Systems
- Information Science, International Journal of Multimedia Information Retrieval
- Journal of Visual Communication and Image Representation, Multimedia Systems
- Multimedia Tools and Applications, Neurocomputing
- Neural Networks
- Neural Processing Letters
- Pattern Analysis and Application
- Pattern Recognition
- Remote Sensing
- Signal Processing
- The Scientific World Journal

### ***Conference Publicity Co-Chair***

- International Conference on Machine Learning and Applications 2012

### ***Conference Registration Chair***

- The 9th International Conference on Internet Multimedia Computing and Service (ICIMCS 2017)

### ***Conference Session/Workshop Chair***

- International Conference on Computational Healthcare 2012

- IEEE International Conference on Systems, Man, and Cybernetics [2013, 2014, 2015, 2016, 2017]
- IEEE International Conference on Data Mining 2016

***Conference PC Member/Reviewer***

- AAI(2017)
- ACPR(2017)
- ASONAM-IT(2017)
- BICS(2016)
- BIDMA(2016-2017)
- CCC(2010, 2013)
- CCCV(2017)
- CCDC(2017)
- CIAC(2013)
- CYBCONF(2017)
- FAB(2015-2017)
- ICCT(2015)
- ICIE(2011)
- ICIMCS(2014-2017)
- ICIST(2014)
- ICME(2014-2017)
- ICMLA(2012)
- ICONIP(2016-2017), ICSPAC(2014)
- ICTAI(2013-2015)
- IJCAI(2017)
- MMM(2015)
- MOD(2015-2017)
- PCM(2015-2017)
- VECTaR(2014)