Lei HUANG (黄 雷)

Ph. D Candidate
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1. Education

- **University of Michigan Ann Arbor**, Visiting Ph. D student in Computer Vision and Machine Learning (2015.9-2016.10)
  Computer Science and Engineering
  Research advisor: Prof. Jia Deng
- **Beihang Univerisity,** Ph.D. Candidate in Computer Science (2011-)
  School of Computer Science and Engineering
  Advisor: Prof. Wei Li
- **Beihang Univerisity,** M.S. in Computer Science (2010-2011)
  School of Computer Science and Engineering
  Advisor: Prof. Wei Li
- **Beihang Univerisity,** B.S. in Computer Science (2006-2010)
  School of Computer Science and Engineering

2. Research Interests

Machine learning: Optimization and Normalization Techniques on Deep Learning, Semi-Supervised Learning, Active Learning, Manifold Learning, Adversarial Examples, Kernel Methods

Computer Vision: Human Pose Estimation, Object Detection and Segmentation, Image Style Transfer

Multimedia Annotation and Retrieval: Large Scale Annotation, Hash Based Nearest Neighbor Search

3. Papers and Publications

Papers (peer-reviewed):

- **Lei Huang**, Dawei Yang, Bo Lang, Jia Deng. Decorrelated Batch Normalization. IEEE CVPR 2018 (accept).

- **Lei Huang**, Xianglong Liu, Bo Lang, Admas Wei Yu, Bo Li. Orthogonal Weight Normalization: Solution to Optimization over Multiple Dependent Stiefel Manifolds in Deep Neural Networks. The Thirty-Second AAAI Conference on Artificial Intelligence (AAAI), Oral, 2018
- **Lei Huang**, Xianglong Liu, Yang Liu, Bo Lang, Dacheng Tao. Centered Weight Normalization in Accelerating Training of Deep Neural Networks. IEEE International Conference on Computer Vision (ICCV). 2017.
- Xianglong Liu, **Lei Huang**, Cheng Deng, Bo Lang, Dacheng Tao. Query-Adaptive Hash Code Ranking for Large-Scale Multi-View Visual Search. IEEE Trans. Image Processing 25(10): 4514-4524 (2016).
- Xianglon**g** Liu, **Lei Huang**, Cheng Deng, Jiwen Lu, Bo Lang. Multi-View Complementary Hash Tables for Nearest Neighbor Search. IEEE International Conference on Computer Vision (ICCV) 2015:1107-1115.
- **Lei Huang**, Xianglong Liu, Binqiang Ma, Bo Lang, Online semi-supervised annotation via proxy-based local consistency propagation, Neurocomputing, Volume 149, Part C, 3 February 2015, Pages 1573-1586.
- **Lei Huang**, Yang Liu, Xindong Wang, Xianglong Liu, Bo Lang. Graph-based active Semi-supervised learning a new perspective for relieving multi-class annotation labor. 2014 IEEE International Conference on Multimedia and Expo (ICME), 14-18 July 2014.
- **Lei Huang**, Yang Wang, Xianglong Liu, Bo Lang. Efficient Semi-supervised Annotation with Proxy-based Local Consistency Propagation**.**2013 IEEE International Conference on Multimedia and Expo (ICME), 15-19 July 2013.
- **Lei Huang**, Yang Liu. BUAA AUDR at ImageCLEF 2012 Photo Annotation Task. CLEF Online Working Notes, 2012.
- Zepeng Gu, Bo Lang, Tongyu Yue, **Lei Huang**. Learning Joint Multimodal Representation Based on Multi-fusion Deep Neural Networks. The 24th International Conference on Neural Information Processing (ICONIP 2017), Oral.
- Yang Liu, **Lei Huang**, Xianglong Liu, Bo Lang: A novel rotation adaptive object detection method based on pair Hough model.Neurocomputing 194: 246-259 (2016)
- Yang Liu, **Lei Huang**, Siqi Wang, Xianglon**g** Liu, Bo Lang. Efficient Segmentation for Region-Based Image Retrieval Using Edge Integrated Minimum Spanning Tree. The 23rd International Conference on Pattern Recognition (ICPR). 2016
- Tianxu Ji, Xianglong Liu, Cheng Deng, **Lei Huang**, Bo Lang. Query-Adaptive Hash Code Ranking for Fast Nearest Neighbor Search. ACM Multimedia 2014, short paper.
- Hualei Shen, Dianfu Ma, Yongwang Zhao, Hailong Sun, Sujun Sun, Rongwei Ye, **Lei Huang**, Bo Lang, Yan Sun. MIAPS: a web-based system for remotely

accessing and presenting medical images. Computer Methods and Programs in Biomedicine (2014) 266-283.

- Mengyun Wang, Xianglong Liu, **Lei Huang**, Bo Lang, Hailiang Yu. Ontology-based Concept Similarity Integrating Image Semantic and Visual Information. 4th International Workshop on Advances in Semantic Information Retrieval 2014.
- Xianglong Liu, Bo Lang, Wei Yu, Junwu Luo, **Lei Huang**. AUDR: An Advanced Unstructured Data Repository，The 6th International Conference on Pervasive Computing and Applications (ICPCA6) South Africa, 2011.

Papers (pre-print):

- **Lei Huang**, Xianglong Liu, Bo Lang, Bo Li. Projection Based Weight Normalization for Deep Neural Networks. preprint (arXiv:1710.02338)
- Adams Wei Yu, **Lei Huang**, Qihang Lin, Ruslan Salakhutdinov, Jaime Carbonell. Block-normalized Gradient Method: an Empirical Study for Training Deep Nerual Network. preprint (arXiv:1712.03563)
- Bo Wu, Yang Liu, Bo Lang, **Lei Huang**. DGCNN: Disordered Graph Convolutional Neural Network Based on the Gaussian Mixture Model. preprint (arXiv:1712.03563)
- Zhibiao Huang, Shan An, **Lei Huang**, Zhaoqi Zhu, Guangfu Che, Yu Chen. Object Parsing Network with Arbitrary Sized Inputs

Patent

- Wei Li, **Lei Huang**, Bo Lang. A wiki-based method of Image Classification evolutionary mechanisms. *Patent No.ZL201110201849.1(China).*

Computer Software Copyright

- Wei Li, Bo Lang, **Lei Huang**. Dynamic Evolution of Image Classification System (DEICS). *Application No.2010SRBJ5853(China).* (First Author as Student)
- Wei Li, Bo Lang, **Lei Huang**. Web Based Unstructured Data Manage System for Big Data. *Application No.2010SRBJ5853(China).* (First Author as Student)
- Wei Li, Bo Lang, **Lei Huang**. Advanced Unstructured Data Repository for Enterprise. *Application No.*2011SR103608*(China).* (First Author as Student)

4. Awards

Scholarships and honors

- China Scholarship Council (CSC) Scholarship, 2015.
- The China National Scholarship for Ph.D. candidate, 2014.
- The “Guanghua” Scholarship, 2013.
- Outstanding graduate, Beihang University. 2010

- The Third Class Scholarship for Academic Performance in Beihang University, 2009
- The Third Class Scholarship for Contest Excellence in Beihang University, 2008
- The Second Class Scholarship for Excellent Freshman in Beihang University, 2006.

Contest

- 2nd Class Prize, the *2nd* Beihang University Dancing Contest, 2010.
- 3rd Class Prize, the *19th FengRu* Contest (the highest tier contest about science and technology in Beihang University), 2009.
- 2nd Class Prize, the *1st* Beihang University Dancing Contest, 2008.
- 2nd Class Prize, ACM Programming Contest of Beihang University, 2008.
- 3rd Class Prize, the *18th* Mathematics Contest for College Students in Beijing, 2007.
- 3rd Class Prize, the *24th* National Physics Contest for College Students in China, 2007.
- 2nd Class Prize, Beihang University Mathematics Contest, 2007.

5. Professional Experience

Professional Activities

- Reviewer: IEEE Transactions on Cybernetics, Neurocomputing, Frontiers of computer science, International Journal of Machine Learning and Cybernetics, Pacific-Rim Conference on Multimedia (PCM-2015)
- Sub-Reviewer: CVPR 2016, NIPS 2016, IJCAI 2017

Invited Talks

- April 25th, 2018, "Normalization Techniques in Training Deep Neural Networks". Toutiao AI Lab, Beijing
- February 28th, 2018. "Orthogonal Weight Normalization: Solution to Optimization over Multiple Dependent Stiefel Manifolds in Deep Neural Networks". Institute of Information Engineering，Chinese Academy of Sciences, Beijing.
- December 21th, 2017. "Deep Neural Networks: Modelling and Training". JD.com, Beijing.
- October 19th, 2017. "Weight normalization techniques in training of deep neural networks". Advanced Computing Research Laboratory, Institute of Computing Technology Chinese Academy of Sciences, Beijing.
- August 17th, 2017. "Normalization techniques in deep learning".

Multimedia Signal and Intelligent Information Processing Laboratory, Tsinghua University, Beijing

- November 1th, 2014. “Graph-based active Semi-Supervised Learning: a new perspective for relieving multi-class annotation labor”. ICT International Exchange Workshop 2014, Laboratory of Advanced Research B, University of Tsukuba, Japan

Research and Development

- 2013.09-Present, Multi View Hash Tables for Nearest Neighbor Search.

  (*National Natural Science Foundation of China, Grant No. 61370125*).

- 2015.09-Present, Semi-supervised learning Based for Large Scale Data (Innovation Foundation of BUAA for PhD Graduates.).

- 2011.09-2015.05

  The student leader of unstructured data management system (The *National Major Research Plan of Infrastructure Software, Grant No.2010ZX01042-002-001-00*)

- 2010.03-2011.09

  The member of unstructured data management system (*The National Major Research Plan of Infrastructure Software, Grant No.2010ZX01042-002-001-00*)

6. IT Skills

Programing: Java, Matlab, Python, Lua, C/C++, JavaScript, PHP, C#
Deep Learning Platform: Torch, PyTorch, Caffe, TensorFlow, Theano
Miscellaneous: Hadoop, Hbase, Lucene, eXist, My Sql