

Ziming Zhang, PhD

Assistant Professor

Department of Electrical & Computer Engineering

Data Science

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Education

- **Oxford Brookes University** Oxford, United Kingdom
PhD. Computer Science
Jun 2010 - Jun 2013
 - Supervisor: Prof. Philip H. S. Torr (now in **University of Oxford**)
- **Simon Fraser University** Burnaby, Canada
M.Sc. Computer Science
Aug 2008 - Apr 2010
 - Supervisors: Prof. Ze-Nian Li and Prof. Mark Drew
- **Northeastern University** Shenyang, P.R.China
B.Eng. Computer Science and Technology
Sep 2001 - Jul 2005
 - Member of the **top computer-specialized** class of the university

Work Experience

- **Worcester Polytechnic Institute** Worcester, MA, United States
Assistant Professor
Oct 2019 - Present
- **Mitsubishi Electric Research Laboratories (MERL)** Cambridge, MA, United States
Principal Research Scientist
Apr 2019 - Sep 2019
- **Mitsubishi Electric Research Laboratories (MERL)** Cambridge, MA, United States
Research Scientist
Oct 2016 - Mar 2019
- **Boston University** Boston, MA, United States
Research Assistant Professor
Jun 2015 - Sep 2016
- **Boston University** Boston, MA, United States
Post-doctor
Feb 2014 - May 2015
- **University of North Carolina** Chapel Hill, NC, United States
Post-doctor
Jul 2013 - Jan 2014

Teaching

- Courses
 - ECE545/CS545: Digital Image Processing, Spring 2020 (26 graduates)
- Undergraduate projects
 - 1 Major Qualifying Project (MQP), 2019-2020

- 1 Independent Studies, 2019-2020

Journal Publications

1. Yao Sui, **Ziming Zhang**, Guanghui Wang, Yafei Tang, and Li Zhang. *Exploiting the Anisotropy of Correlation Filter Learning for Visual Tracking*. International Journal of Computer Vision (IJCV). 2019.
2. **Ziming Zhang**, Yun Liu, Xi Chen, Yanjun Zhu, Ming-Ming Cheng, Venkatesh Saligrama, and Philip H.S. Torr. *Sequential Optimization for Efficient High-Quality Object Proposal Generation*. IEEE Transaction on Pattern Analysis and Machine Intelligence (TPAMI). 2017.
3. **Ziming Zhang**, Venkatesh Saligrama. *PRISM: Person Re-Identification via Structured Matching*. IEEE Transaction on Circuits and Systems for Video Technology (TCSVT). June 2016.
4. **Ziming Zhang**, Philip H.S. Torr. *Object Proposal Generation using Two-Stage Cascade SVMs*. IEEE Transaction on Pattern Analysis and Machine Intelligence (TPAMI). 2016 Jan;38(1):102-15. doi: 10.1109/TPAMI.2015.2430348.
5. **Ziming Zhang**, Heng Huang, Dinggang Shen. *Integrative Analysis of Multi-Dimensional Imaging Genomics Data for Alzheimer's Disease Prediction*. Frontiers in Aging Neuroscience, 2014. (Impact factor: 4.000)

Conference Publications

1. Yecheng Lyu, Xinming Huang, **Ziming Zhang**. *Learning to Segment 3D Point Clouds in 2D Image Space*. In Proceeding of Computer Vision and Pattern Recognition (CVPR), 2020. (oral)
2. Anil Kag, **Ziming Zhang**, Venkatesh Saligrama. *RNNs Incrementally Evolving on an Equilibrium Manifold: A Panacea for Vanishing and Exploding Gradients?* In Proceeding of International Conference on Learning Representations (ICLR), 2020.
3. **Ziming Zhang**, Wenchu Ma, Yuanwei Wu, Guanghui Wang. *Self-Orthogonality Module: A Network Architecture Plug-in for Learning Orthogonal Filters*. In Proceeding of Winter Conference on Applications of Computer Vision (WACV), 2020.
4. Wenju Xu, Guanghui Wang, Alan Sullivan, **Ziming Zhang**. *Towards Learning Affine-Invariant Representations via Data-Efficient CNNs*. In Proceeding of Winter Conference on Applications of Computer Vision (WACV), 2020.
5. Mahdi Elhousni, Yecheng Lyu, Xinming Huang, **Ziming Zhang**. *Automatic Building and Labeling of HD Maps with Deep Learning*. In Proceeding of Thirty-Second Annual Conference on Innovative Applications of Artificial Intelligence (IAAI), 2020
6. Yuanwei Wu, **Ziming Zhang**, Guanghui Wang. *Unsupervised Deep Feature Transfer for Low Resolution Image Classification*. In Proceeding of Workshop and Challenge on Real-World Recognition from Low-Quality Images and Videos, International Conference on Computer Vision (ICCV), 2019.
7. Jian Zheng, Teng-Yok Lee, Chen Feng, Xiaohua Li, **Ziming Zhang**. *Robust Attentional Pooling via Feature Selection*. In Proceeding of International Conference on Pattern Recognition (ICPR), 2018.
8. **Ziming Zhang**, Yuanwei Wu, Guanghui Wang. *BPGGrad: Towards Global Optimality in Deep Learning via Branch and Pruning*. In Proceeding of Computer Vision and Pattern Recognition (CVPR), 2018.

9. **Ziming Zhang**, Matthew Brand. *Convergent Block Coordinate Descent for Training Tikhonov Regularized Deep Neural Networks*. In Proceeding of Advances in Neural Information Processing Systems (NIPS), 2017.
10. Chiori Hori, Takaaki Hori, Teng-Yok Lee, **Ziming Zhang**, Bret Harsham, John R. Hershey, Tim K. Marks, Kazuhiro Sumi. *Attention-Based Multimodel Fusion for Video Description*. In Proceeding of International Conference on Computer Vision (ICCV), 2017.
11. **Ziming Zhang**, Venkatesh Saligrama. *Zero-Shot Recognition via Structured Prediction*. In Proceeding of European Conference on Computer Vision (ECCV), 2016.
12. Yao Sui, **Ziming Zhang**, Guanghui Wang, Yafei Tang, Li Zhang. *Real-Time Visual Tracking: Promoting the Robustness of Correlation Filter Learning*. In Proceeding of European Conference on Computer Vision (ECCV), 2016.
13. **Ziming Zhang**, Yuting Chen, Venkatesh Saligrama. *Efficient Training of Very Deep Neural Networks for Supervised Hashing*. In Proceeding of Computer Vision and Pattern Recognition (CVPR), 2016.
14. **Ziming Zhang**, Venkatesh Saligrama. *Zero-Shot Learning via Joint Latent Similarity Embedding*. In Proceeding of Computer Vision and Pattern Recognition (CVPR), 2016.
15. **Ziming Zhang**, Venkatesh Saligrama. *Zero-Shot Learning via Semantic Similarity Embedding*. In Proceeding of International Conference on Computer Vision (ICCV), 2015.
16. **Ziming Zhang**, Yuting Chen, Venkatesh Saligrama. *Group Membership Prediction*. In Proceeding of International Conference on Computer Vision (ICCV), 2015.
17. Gregory D. Castanon, Yuting Chen, **Ziming Zhang**, Venkatesh Saligrama. *Efficient Activity Retrieval through Semantic Graph Queries*. In Proceeding of ACM International Conference on Multimedia (ACM MM), 2015: 391-400. (oral)
18. **Ziming Zhang**, Venkatesh Saligrama. *RAPID: Rapidly Accelerated Proximal Gradient Algorithms for Convex Minimization*. In Proceeding of International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2015.
19. **Ziming Zhang**, Yuting Chen, Venkatesh Saligrama. *A Novel Visual Word Co-occurrence Model for Person Re-identification* In ECCV Workshop on Visual Surveillance and Re-Identification, 2014.
20. Ming-Ming Cheng, **Ziming Zhang**, Wen-Yan Lin, Philip H.S. Torr. *BING: Binarized normed gradients for objectness estimation at 300fps*. In Proceeding of Computer Vision and Pattern Recognition (CVPR), 2014. (oral, acceptance rate 5.75%)
21. **Ziming Zhang**, Paul Sturges, Sunando Sengupta, Nigel Crook, Philip H.S. Torr. *Efficient Discriminative Learning of Parametric Nearest Neighbor Classifiers*. In Proceeding of Computer Vision and Pattern Recognition (CVPR), 2012. (acceptance rate 21.6%)
22. **Ziming Zhang**, Lubor Ladicky, Philip H.S. Torr, Amir Saffari. *Learning Anchor Planes for Classification*. In Proceeding of Advances in Neural Information Processing Systems (NIPS), 2011: 1611-1619. (acceptance rate 24%)
23. **Ziming Zhang**, Jonathan Warrell, Philip H.S. Torr. *Proposal Generation for Object Detection using Cascaded ranking SVMs*. In Proceeding of Computer Vision and Pattern Recognition (CVPR), 2011: 1497-1504. (acceptance rate 22.5%)
24. **Ziming Zhang**, Jiawei Huang, Ze-Nian Li. *Learning Sparse Features On-Line for Image Classification*. In Proceeding of International Conference on Image Analysis and Recognition (ICIAR), 2011: 122-131. (oral, acceptance rate 29.6%)

25. **Ziming Zhang**, Jiawei Huang, Ze-Nian Li. *Discovering Motion Patterns for Human Action Recognition*. In Proceeding of Pacific-Rim Conference on Multimedia (PCM), 2010: 716-727.
26. **Ziming Zhang**, Ze-Nian Li, and Mark Drew. *Learning Image Similarities via Probabilistic Feature Matching*. In Proceeding of International Conference on Image Processing (ICIP), 2010: 1857-1860. (**oral**, acceptance rate 15%)
27. **Ziming Zhang**, Ze-Nian Li, and Mark Drew. *AdaMKL: A Novel Biconvex Multiple Kernel Learning Approach*. In Proceeding of International Conference on Pattern Recognition (ICPR), 2010: 2126-2129. (**oral**, acceptance rate 18%)
28. **Ziming Zhang**, Ze-Nian Li, and Mark Drew. *Feature Correspondence with Constrained Global Structures*. In Proceeding of International Conference on Image Processing (ICIP), 2009: 177-180.
29. **Ziming Zhang**, Yiqun Hu, Syin Chan, and Liang-Tien Chia. *Motion Context: A New Representation for Human Action Recognition*. In Proceeding of European Conference on Computer Vision (ECCV), 2008: 817-829.
30. **Ziming Zhang**, Syin Chan, and Liang-Tien Chia. *Image Classification Using Tensor Representation*. In Proceeding of ACM International Conference on Multimedia (MM), 2007: 281-284.
31. **Ziming Zhang**, Syin Chan, and Liang-Tien Chia. *Discriminative Signatures for Image Classification*. In Proceeding of International Conference on Image Processing (ICIP), 2007: 197-200.
32. **Ziming Zhang**, Syin Chan, and Liang-Tien Chia. *Codebook+: A New Module for Creating Discriminative Codebooks*. In Proceeding of International Conference on Multimedia and Expo (ICME), 2007: 815-818.

Fellowships & Grants

1. *Multi-Source Object Re-Identification: A Probabilistic Framework*. GDMS University Research RFP 2020, PI, \$100,000
2. *Real-Time Geo-Rectification for UAV Videos Using Deep Learning*. GDMS University Research RFP 2020, Co-PI, \$100,000

Invited Talks

- United Imaging Intelligence, Cambridge, MA, Jan 2020
- Wayfair, Boston, MA, Jan 2020
- IBM Research at Boston, MA, Sep 2018
- Deep Learning Summit, Boston, May 2018
- IVC Seminar at Department of Computer Science, Boston University, MA, April 2017
- Microsoft Research at NYC, NY, May 2016
- IBM Research at Watson, NY, May 2016
- Department of Computer Science, City College of New York, NY, May 2016

- BBN Technologies, MA, May 2016
- Department of Electrical and Computer Engineering, Tufts University, MA, Feb 2015
- Department of Computer Science, Boston College, MA, Nov 2014
- IVC Seminar at Department of Computer Science, Boston University, MA, Sep 2014

Patents

1. Gregory D. Castanon, Venkatesh Saligrama, **Ziming Zhang**, and Yuting Chen. *Large Scale Video Search Using Queries that Define Relationships Between Objects*. Nov 2014.
2. **Ziming Zhang** and Matthew Brand. *On the Convergence of Block Coordinate Descent in Training DNNs with Tikhonov Regularization*. 2017.

Professional Activities

- Co-organizer of Workshop on Vision Applications and Solutions to Biased or Scarce Data (VASBSD 2020) in Winter Conference on Applications of Computer Vision (WACV), 2020
- Section Chair in Workshop on Recent Trends in Computer Vision, 2015
- Member, Institute of Electrical and Electronics Engineers (IEEE)
- Reviewer for
 - Transactions on Information Theory (TIT)
 - Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
 - Transactions on Image Processing (TIP)
 - Transaction on Medical Imaging (TMI)
 - International Journal of Computer Vision (IJCV)
 - Journal of Machine Learning Research (JMLR)
 - International Journal of Pattern Recognition and Artificial Intelligence (IJPRAI)
 - International Journal of Image and Graphics (IJIG)
 - Pattern Recognition (PR), Neurocomputing
 - Transactions on Cybernetics (CYB)
 - Signal Processing, PLOS ONE
- Reviewer/PC Member for
 - Neural Information Processing Systems (NIPS)
 - International Conference on Machine Learning (ICML)
 - International Conference on Learning Representations (ICLR)
 - Association for the Advancement of Artificial Intelligence (AAAI)
 - Artificial Intelligence and Statistics Conference (AISTATS)
 - International Joint Conferences on Artificial Intelligence (IJCAI)

Conference on Computer Vision and Pattern Recognition (CVPR)
International Conference on Computer Vision (ICCV)
European Conference on Computer Vision (ECCV)
International Conference on Robotics and Automation (ICRA)

Honours & Awards

R&D 100 Award (the most prestigious innovation awards program for the past 56 years) 2018
MELCO ITC Award 2018
MERL Research Award 2018

Service to Department & University

- ECE MS candidate committee, 2020

Supervised/Co-supervised Students

- Intern@MERL
 - Yuanwei Wu (University of Kansas)
 - Venkatesh N. Murthy (University of Massachusetts at Amherst)
 - Wenbo Liu (Carnegie Mellon University)
 - Jian Zheng (Binghamton University, State University of New York)
 - Rongmei Lin (Emory University)
 - Weiyang Liu (Georgia Institute of Technology)
 - Wenju Xu (University of Kansas)
 - Zudi Lin (Harvard University)
 - Yecheng Lyu (Worcester Polytechnic Institute)
- PhD.
 - Yuting Chen (Boston University, co-supervised with Prof. Saligrama), 2014-2016
 - Tolga Bolukbasi (Boston University, co-supervised with Prof. Saligrama), 2014-2016
 - Yecheng Lyu (WPI, co-supervised with Prof. Xinming Huang), 2019-now
 - Ming Li (WPI), 2019-now
- Master
 - Philip Tran (Boston University, now in MIT Lincoln Laboratory), 2014