

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)
- 1 Major Qualifying Project (MQP) for undergraduate, 2019-2020
- 2 Independent Studies for graduate, 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**, acceptance rate 5.0%)
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. (acceptance rate 26.5%)
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. (acceptance rate: 46.1%, second round, algorithm track)
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. (acceptance rate: 30.0%, first round, algorithm track)
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. (**oral**)
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
BMVA Travel Bursary Award (£750)	2012
PASCAL2 Travel Grant (£800)	2011
Deskin Sales Graduate Scholarship (C\$700)	2009
Computing Science Graduate Fellowship (C\$6250)	2009
Nanyang Technological University Graduate Scholarship	2006 - 2008
Successful Participation Award in Mathematical Contest in Modeling (MCM)	2004
First-Class Award in Liaoning Province in Chinese Mathematical Contest in Modeling (CMCM)	2003
Northeastern University Academic Scholarship	2001 - 2005
Northeastern University Entrance Fellowship	2001
First-Class Award in Chinese Physics Olympic Competition (23 rd place in Liaoning Province)	2000
Second-Class Award in Chinese Chemistry Olympic Competition	2000
Third-Class Award in Chinese Mathematics Olympic Competition	2000
First-Class Award in Chinese Physics Olympic Competition (3 rd place in Shenyang City)	1998

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
 - Yecheng Lyu (WPI, co-supervised with Prof. Xinming Huang), 2019-now
 - Ming Li (WPI), 2019-now