Curriculum Vitae

Shuai Zhang
Senior Machine Learning Engineer
Qualcomm
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Education

- **University of California, Irvine** Irvine, CA
  Department of Mathematics, Ph.D. in Mathematics *2012–2017*
  Department of Mathematics, M.S. in Mathematics *2012–2014*
  - Advisor: Prof. Jack Xin
  - Research areas: Compressed Sensing; Image Processing and Machine Learning
- **Shandong University** Jinan, China
  Department of Mathematics, M.S. in Computational Mathematics (GPA: 3.7 / 4.0) *2009–2012*
  Department of Mathematics, B.S. in Applied Mathematics (GPA: 3.83 / 4.0) *2005–2009*

Research:

Applied Mathematics, Numerical Optimization, Machine Learning, Computer Vision.

Experience

- **Senior Machine Learning Engineer at Qualcomm Technologies, Inc** *07/10/2017 - Now*
  Address: 5775 Morehouse Drive, San Diego, CA, 92121
  Job description:

  Research on fast computer vision algorithms on edge devices, like mobile and auto;
  Work on real time 3D face authentication systems (FaceID) on Android devices (including face detection, anti-spoofing, eye attention detection and user adaptation);
  Work on real time person segmentation projects embedded in mobile cameras.

  Achievements:

  Fast and efficient computer vision solutions on Qualcomm mobile chips;
  Submitted 4 Patents (filed and under review);
  Published several papers on Top conferences and Journals in the fields of applied mathematics and machine learning;

Manuscripts:

1. J. Lyu, S. Zhang, Y. Qi, J. Xin. AutoShuffleNet: Learning Permutation Matrices via an Exact Lipschitz Continuous Penalty in Deep Convolutional Neural Networks. *arXiv preprint, arXiv: 1901.08624*.

Published Papers:

1. Y. Xu, Y. Li, S. Zhang, W. Wen, B. Wang, Y. Qi, Y. Chen, W. Lin, H. Xiong. Trained Rank Pruning for Efficient Deep Neural Networks. *to appear in The NeurIPS 2019 Workshop on Energy Efficient Machine Learning and Cognitive Computing (EMC2), 2019*.
2. E. Mequanint, S. Zhang, B. Forutanpour, Y. Qi, N. Bi. Weakly-Supervised Degree of Eye-Closeness Estimation. *IEEE ICCV Workshop on Egocentric Perception, Interaction and Computing, 2019*
3. B. Yang, J. Xin, J. Lyu, S. Zhang, Y. Qi. Channel Pruning for Deep Neural Networks via a Relaxed Groupwise Splitting Method. *IEEE The second International Conference on Artificial Intelligence for Industries (AI4I), 2019*.
4. F. Xue, J. Xin, J. Lyu, S. Zhang, Y. Qi. A Multistage Backward Differentiable Method for Constructing Light Convolutional Neural Networks. *IEEE The second International Conference on Artificial Intelligence for Industries (AI4I), 2019*.

5. Y. Xu, S. Zhang, X. Zhang, Y. Qi, J. Guo, W. Lin, H. Xiong. DNQ: Dynamic Network Quantization. *IEEE Data Compression Conference (DCC), 2019*.
6. P. Yin, J. Lyu, S. Zhang, S. Osher, Y-Y. Qi, J. Xin. Understanding Straight-through Estimator in Training Activation Quantized Neural Nets. *Seventh International Conference on Learning Representations (ICLR), 2019*
7. X. Li, S. Zhang (co-first author), B. Jiang, Y. Qi, M. Chuah, N. Bi. DAC: Data-free Automatic Acceleration of Convolutional Networks. *IEEE Winter Conference on Applications of Computer Vision (WACV), 2019*
8. P. Yin, S. Zhang (co-first author), J. Lyu, S. Osher, Y-Y. Qi, J. Xin. Blended Coarse Gradient Descent for Full Quantization of Deep Neural Networks. *Research in the Mathematical Sciences, DOI:10.1007/s40687-018-0177-6, 2019*.
9. P. Yin, S. Zhang (co-first author), J. Xin, Y. Qi. Quantization and Training of Low Bit-Width Convolutional Neural Networks for Object Detection. *Journal of Computational Mathematics, 37(3), pp. 1-12, 2019*.
10. P. Yin, S. Zhang (co-first author), J. Lyu, S. Osher, Y. Qi, J. Xin. BinaryRelax: A Relaxation Approach For Training Deep Neural Networks With Quantized Weights. *SIAM Journal on Imaging Sciences, 11(4): 2205-2223, 2018*.
11. S. Zhang, J. Xin. Minimization of Transformed L_1 Penalty: Theory, Difference of Convex Function Algorithm, and Robust Application in Compressed Sensing. *Mathematical Programming, Series B, 169(1), pp. 307-336, 2018*.
12. S. Zhang, P. Yin, J. Xin. Transformed Schatten-1 Iterative Thresholding Algorithms for Low Rank Matrix Completion. *Communications in Mathematical Sciences, 15(3), pp. 839–862, 2017*.
13. S. Zhang, J. Xin. Minimization of Transformed L_1 Penalty: Closed Form Representation and Iterative Thresholding Algorithms. *Communications in Mathematical Sciences, 15(2), pp. 511–537, 2017*.
14. H. Wang, H. Rui, S. Zhang. An Optimal-order Error Estimate for the Mass-conservative Characteristic Finite Element Scheme. *Applied Mathematics and Computation, 218(20):10271–10278, 2012*.

Invited Talks in Conferences

1. Southern California Applied Mathematics Symposium, CA US, Jun 4, 2016
2. SIAM Conference on Imaging Science, Albuquerque NM US, May 23 - 26, 2016
3. IEEE Winter Conference on Applications of Computer Vision (WACV), Hawaii US, Jan 8 - 10, 2019
4. IEEE The second International Conference on Artificial Intelligence for Industries (AI4I), Irvine CA US, Sep 21 - 23, 2019
5. The 5th Workshop on Energy Efficient Machine Learning and Cognitive Computing, Vancouver BC Canada, Dec 13, 2019

Awards

Third Award in Low Latency Object Detection The IEEE Low-Power Image Recognition Challenge (LPIRC) 2019
Second Awards in Both Low Latency Image Classsification and Detection The IEEE Low-Power Image Recognition Challenge (LPIRC) 2018
Kovalevsky Outstanding Ph.D. Thesis Award University of California, Irvine 2017
SIAM Student Travel Award Society for Industrial and Applied Mathematics (SIAM) 2016
Von Neumann Outstanding Research Award University of California, Irvine 2014-2015

Conference Technical Committee

EMC2: The 5th workshop on Energy Efficient Machine Learning and Cognitive Computing, 2019
The Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20), 2020
ACM Multimedia Systems Conference (MMsys), 2019
International Joint Conference on Artificial Intelligence (IJCAI), 2019

Paper Reviews

IEEE Transactions on Information Forensics and Security
IEEE Transactions on Image Processing
IEEE Transactions on Vehicular Technology
IEEE Transactions on Signal Processing
IEEE International Conference on Image Processing (ICIP), 2018
IEEE Winter Conference on Applications of Computer Vision (WACV), 2019

IEEE International Conference on Computer Vision (ICCV), 2019
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2019
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020
European Conference on Computer Vision (ECCV), 2020
Neural Processing Letters, Springer
Neural Networks, Elsevier
International Journal of Image and Graphics
Communications in Mathematical Sciences