Wei WEN

412-944-8906 | weiwen.web@gmail.com | http://www.pittnuts.com/ | https://github.com/wenwei202

EDUCATION

Duke University   *Durham, NC, United States*   *08/2017-*

    Ph.D.   Electrical and Computer Engineering   Supervisor: Dr. Hai Li

    Research Area: Deep Learning & Neuromorphic Computing

University of Pittsburgh   *Pittsburgh, PA, United States*   *09/2014-08/2017 (Transfer to Duke)*

    Ph.D.   Electrical and Computer Engineering   GPA: 3.952   Supervisor: Dr. Hai Li

Beihang University   *Beijing, China,*   *09/2006-07/2010, 09/2010-01/2013*

    B.S., M.S.   Electronic and Information Engineering   Rank: 10/170 (B.S.)

SELECTED PUBLICATION

- **Wei Wen,** Cong Xu, Feng Yan, Chunpeng Wu, Yandan Wang, Yiran Chen, Hai Li, "*TernGrad: Ternary Gradients to Reduce Communication in Distributed Deep Learning*", the 31st Annual Conference on Neural Information Processing Systems (***NIPS***), 2017. (***Oral, 40/3240=1.2%***)

- **Wei Wen,** Cong Xu, Chunpeng Wu, Yandan Wang, Yiran Chen, Hai Li, "*Coordinating Filters for Faster Deep Neural Networks*", Proceedings of the IEEE International Conference on Computer Vision (***ICCV***), 2017.

- **Wei Wen,** Chunpeng Wu, Yandan Wang, Yiran Chen, Hai Li, "*Learning Structured Sparsity in Deep Neural Networks*", the 30th Annual Conference on Neural Information Processing Systems (***NIPS***), 2016.

- Jongsoo Park, Sheng Li, **Wei Wen**, Ping Tak Peter Tang, Hai Li, Yiran Chen, Pradeep Dubey, "*Faster CNNs with Direct Sparse Convolutions and Guided Pruning*", the 5th International Conference on Learning Representations (***ICLR***), 2017.

- Chunpeng Wu, **Wei Wen**, Tariq Afzal, Yongmei Zhang, Yiran Chen, Hai Li, "*A Compact DNN: Approaching GoogLeNet-Level Accuracy of Classification and Domain Adaptation*", ***CVPR***, 2017.

- Yandan Wang, **Wei Wen,** Linghao Song, Hai Li, "*Classification Accuracy Improvement for Neuromorphic Computing Systems with One-level Precision Synapses* ", ***ASP-DAC***, 2017. (***Best Paper Award***)

- **Wei Wen**, Chunpeng Wu, Yandan Wang, Kent Nixon, Qing Wu, Mark Barnell, Hai Li, Yiran Chen, "*A New Learning Method for Inference Accuracy, Core Occupation, and Performance Co-optimization on TrueNorth Chip*", the 53rd Design Automation Conference (***DAC***), 2016. (***Best Paper Nomination***)

- **Wei Wen**, Chi-Ruo Wu, Xiaofang Hu, Beiye Liu, Tsung-Yi Ho, Xin Li, Yiran Chen, "*An EDA Framework for Large Scale Hybrid Neuromorphic Computing Systems*", the 52nd Design Automation Conference (***DAC***), 2015. (***Best Paper Nomination***).

INDUSTRY EXPERIENCE

Microsoft Research, *AI & Research, Redmond, WA, USA*   *05/2017-07/2017*

    Supervisor: Yuxiong He & Fang Liu

- Machine Reading Comprehension;
- Recurrent Neural Networks.

HP Labs, *Platform Architecture Group, Palo Alto, CA, USA*   *06/2016-09/2016*

    Summer Intern, Supervisor: Dr. Paolo Faraboschi and Dr. Cong Xu

- Benchmarked Distributed Deep Learning Systems.

Agricultural Bank of China, *Software Development Center, Beijing, China*   *07/2013-07/2014*

    Software Developer Employee, Supervisor: Mr. Lei Fan

- Developed web services for online bank transactions.

Microsoft Research, *Mobile and Sensing Systems Group, Beijing, China*   *04/2013-06/2013*

    Research Intern on Mobile Computer Vision, Supervisor: Dr. Guobin Shen

    Worked on a mobile system that dynamically generates frontal views for the user even when the user is at a slant viewing angle.

Tencent Inc., *Advertising Platform and Products Division, Beijing, China*   *07/2012-09/2012*

    Software Developer Intern, Supervisor: Mr. Yanan Zhao

- Developed MVC-framework-based advertising websites which had millions of Page View per day;
- Optimized database access based on cache mechanism and fixed connection-blocking bug

ACADEMIA EXPERIENCE

TernGrad: Ternary Gradients to Reduce Communication in Distributed Deep Learning   *01/2017-05/2017*

- Quantizing floating gradients of SGD to ternary levels to speedup distributed training of Deep Neural Networks.
- Oral in NIPS 2017 (https://github.com/wenwei202/terngrad).

Lower-rank Deep Convolutional Neural Networks   *09/2016-03/2017*

- Exploring to improve low-rank approximation methods to obtain faster deep neural networks.
- ICCV 2017

Learning Structured Sparsity in Deep Neural Networks   *12/2015-05/2016*

- GitHub contribution: "Caffe for Structurally Sparse Deep Neural Networks" (https://github.com/wenwei202/caffe/tree/scnn)
  - Dimensionality Reduction: Utilized PCA to approximate weights by basis in much lower space to reduce computation.
  - Group-lasso Regularization: Enforced structured sparsity constraints to learn the number of filters, channels, neurons and layers in deep neural nets.
  - Caffe CPU & GPU Implementation: 3× speedup in GPUs and 5× speedup in CPUs.

TrueNorth Cognitive Learning   *09/2015-12/2015*

- Developed a new learning method for spiking neural networks in IBM TrueNorth chip;
- Improved accuracy and reduced core occupation in TrueNorth chip;

Brain-inspired Computing Systems   *09/2014-04/2015*

- Spectral Clustering: proposed Iterative Spectral Clustering algorithm to group connections of large-scale sparse neural networks into small clusters, so that connections can be locally and densely realized by Brain-inspired Computing Systems.

SKILLS

- Languages: C/C++/CUDA C (5 years), Java (2 years), Python & numpy (2 years)
- Machine learning & computer vision: TensorFlow, Caffe, OpenCV (2 years)
- Linux, Bash Shell, git and svn (4 years)
- Android Development (with Google Play publications)
- Database: MySql, SQL Server, Sybase
- Multimedia: x264 and FFmpeg (1 year)
- Matlab (3 years)

SELECTED HONORS & AWARDS

- Best Paper Award, ASP-DAC, IEEE   2017
- NIPS Travel Award   2016
- Best Paper Nomination, Design Automation Conference (DAC), IEEE   2016
- Best Paper Nomination, Design Automation Conference (DAC), IEEE   2015
- National Scholarship (3/233), Ministry of Education, China   2009
- First Prize, Graduate Scholarship, Beihang University   2010
- First Prize, Electronic Design Competition, Beihang University   2009
- Excellent Student Honor, Beihang University   2009
- Second Prize, Mathematical Competition, Beihang University   2008
- Second Prize, National College Physics Competition   2007