Bitan Hou | Curriculum Vitae

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Profile

Deep Motion **Beijing, China**
Full Time Employee, Deep Learning R&D Engineer *Nov 2018 – Present*

Microsoft Research Asia(MSRA) **Beijing, China**
Intern, System Research Group *July 2018 – Nov 2018*

Shanghai Jiao Tong University(SJTU) **Shanghai, China**
Bachelor of Engineering, Outstanding Graduate *Sep 2014 – July 2018*

- School: Electronic Information and Electrical Engineering Dept.: Electronic Engineering (EE)
- GPA of Upper Division Work: **3.83/4.3** Standing: **4/60**

Publication

- Bitan Hou(SJTU, MSRA), Yujing Wang(MSRA), Ming Zeng(CMU), Shan Jiang(UIUC), Ole Meng Shoel(CMU), Customized Graph Embedding, AAAI. (Submitted)

Work&Research Experience

Self-Driving Car, Deployment, Quantization, Model Conversion, NAS, Detection, NVIDIA
FTE in Deep Motion, collaborate with Chief-Scientist Kuiyuan Yang and CTO Zhiwei Li *Nov 2018 – present*

- **Deloyment**: Deployed models on various embedded systems and devices for practical applications, such as NVIDIA Jetson AGX Xavier, Jetson TX2, Jetson Nano, HUAWEI Atlas200DK, and potentially TDA3x of Texas Instruments(TI) in the future. Proficient with the NVIDIA TensorRT platform for high-performance inference.
- **Quantization**: Familiar with model quantization, especially 8-bit. Dived into QNNPACK, a Caffe2 package, and applied it to our models within one month after its release from Facebook. Widely used in our company due to the highly efficient performance($1/4$ size, 5x speed, only 1% AP drop).
- **Model Conversion**: Developed a python package for model conversion between DL frameworks in mobile device deployment. It can successfully convert PyTorch models to Caffe and Caffe2, and is put into practical use within our company.
- **Neural Architecture Search(NAS)**: Familiar with DARTS, Proxyless NAS(Song Han), Auto-DeepLab(Feifei Li) and Ramdom NAS. Reproduced their methods and extended them to dense image prediction. To our best knowledge, there were no published works which transferred the classification and segmentation tasks to detection then.
- **ImageNet Training**: Provided the essential pre-trained models for my colleagues, because I was the only one who trains ImageNet from scratch in our company. Used NVIDIA Data Loading Library (DALI) to accelerate the training process substentially(from 28 GPU-days to 4 GPU-days on GTX-1080Ti) without accuracy reduction. Significantly improving the efficiency by using *Mixed Precision Training*, based on tensor cores introduced by Volta Generation of GPUs, it has 8x throughput and no accuracy reduction.
- **Caffe Parser**: Developed a C++ library for Caffe parser. Widely used by our company due to its flexibility.

Auto ML, NLP, Graph Embedding
Intern in MSRA *July 2018 – Nov 2018*

- Reproduced the related papers about graph embeding, such as DeepWalk, Node2Vec, and Plantoid.
- To address the common problem of walk-based graph embedding methods, which are disconnected from the target application, we proposed a novel semi-supervised approach, Customized Graph Embedding, which significantly improve the performance of clustering and representation, and will be applied to search relevance and recommendation system. Submitted a first-author to AAAI2020. Supervised by Yujing Wang and Ming Zeng.

Face Recognition
Final Year Project of Undergradudate *Nov 2017 – Jun 2018*

- Developed a face recognition system by Convolutional Neural Network(CNN) for a commercial application, which has an excellent performance in both face comparison(95.53% on YTF) and identity verification(99.95%). It has been used for city security. Supervised by Weiyao Lin.

Photonic Crystals
Tsung-Dao Lee Chinese Undergraduate Research Program *Jun 2017 – Jun 2018*

- Did research about Photonic Crystals. Submitted a first-author paper: *Dynamic control of optical pulse delay time* to Optica. Supervised by Prof. Chun Jiang. This project is supported by Tsung-Dao Lee, who won Nobel Prize in Physics and is a faculty of Columbia University.

Silicon Photonics Devices
Talents Program of SJTU *Jun 2017 – Jun 2018*

- Learnt the function and fabrication process about the silicon devices and semiconductor devices. Familiar with Finite-Difference Time-Domain(FDTD) analysis method.

Honors & Awards

Outstanding Graduate of Shanghai Jiao Tong University *2018*
Honorable Mention of Mathematical Contest in Modeling(MCM), America *2017*
Second Prize of National Undergraduate Electronics Design Contest(Shanghai, China) *2017*
Tsung-Dao Lee Scholarship *2017*
Ji Hanbing Alumnus Scholarship *2017*
Liu Yongling Fellowship(Hong Kong) *2017*
Academic Excellence Scholarship (Second Class) of Shanghai Jiao Tong University *2017*
The Merit Student of Shanghai Jiao Tong University *2016*
National Endeavor Fellowship of Shanghai Jiao Tong University *2016*
Third Prize in China Undergraduate Mathematical Contest in Modeling(Shanghai, China) *2016*
Academic Excellence Scholarship (Third Class) of Shanghai Jiao Tong University *2016*
Third Prize in Texas Instruments(TI) Cup Electronic Design Contest (SJTU) *2016*

Conferences, Short-Term Programs, Voluntary and Soicial Activities

Computing in the 21th Century Conferences & MSRA Faculty Submmit
Invited Audience *2018, LINK*

Building Bridges Education Support Program, with Yale U(Organizer), Hong Kong U, Peking U
Team Leader. Certificated by the Aixin Foundation Inc. of the United States. *2017, LINK*

Tsinghua University(THU) Summer Camp: Nano-OptoElectronics Lab
Certificate as Outstanding participant by Department of Electronic Engineering, THU *2017, LINK*

Top China Summer Program: Buliding an Inclusive Society and Our Responsibility
Team Leader. Certificated by the International Student Center of SJTU. *2016, LINK*

Career & Leadership Development Program
Served as Coach. Certified by China Soong Ching Ling Foundation, Liaison Department. *2015, LINK*

Shanghai International Marathon
Volunteer. Served thousands of athletes and running enthusiasts from all over the world. *2014,2015,2016*

Skills

- **Basic Skills**: Vim, Git, Regular Expression, Linux OS, ZSH, Py-Binding, Google Protobuf
- **Programming**: Python, C/C++, CUDA, HTML, JS, CSS, Java, Neon, Verilog/VHDL, LaTeX
- **DL Frameworks**: Proficient[PyTorch, Caffe, Caffe2], Familiar[Theano, Keras, Tensorflow, MxNet]
- **DL Algorithms**: SSD, FPN, FasterRCNN, One/Two Stage, ROI Pooling/Align, MobileNetv3, EfficientNet
- **Humanities**: The Bible and the Western Culture, Evolution of Ancient Greek, The History of Jews
- **Interests**: Guitar, Singing, Reading, Traveling, Biking, Basketball, Badminton, Tennis, Swimming