

# Bitan Hou | Curriculum Vitae

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## Profile

### Deep Motion

Full Time Employee, Deep Learning R&D Engineer

Beijing, China

Nov 2018 – Present

### Microsoft Research Asia (MSRA)

Intern, System Research Group

Beijing, China

July 2018 – Nov 2018

### Shanghai Jiao Tong University (SJTU)

Bachelor of Engineering, Outstanding Graduate (Top 3%)

Shanghai, China

Sep 2014 – July 2018

- School: Electronic Information and Electrical Engineering, Department: Electronic Engineering (EE)
- GPA of Upper Division Work: 3.83/4.3(89.59/100), Standing: 4/60

## Publication

- Bitan Hou, Yujing Wang, Ming Zeng, Shan Jiang, Ole Meng Shoel, Yunhai Tong, Jing Bai, Mao Yang, Customized Graph Embedding, *The Thirty-Fourth AAAI(2020) Conference on Artificial Intelligence*. (Submitted)

## Work&Research Experience

### Work on Edge Computing for Self-Driving Car

Supervisor: Kuiyuan Yang (Chief-Scientist) and Zhiwei Li (CTO)

Nov 2018 – present

- **Model Acceleration & Deployment (100k+ lines of C++)**
  - Experience using various popular Deep Learning Edge Devices for practical applications, such as NVIDIA Xavier, TX2, Nano, HUAWEI Atlas200DK and TDA3x of Texas Instruments (TI)
  - Deployed 80+ models with expertise in the NVIDIA **TensorRT** platform for high-performance inference
  - Created **20+ bindings** of existing C++ code, using C++ code through python API
- **Quantization**
  - Dived into QNNPACK, a Caffe2 8-bit quantization framework, and applied to algorithms within one month of its release from Facebook;
  - Widely used due to its highly efficient performance (**1/4 size, 5x speed, only 1% AP drop**)
- **Model Converter (10k+ lines of Python)**
  - Developed a python package for model conversion between DL frameworks
  - Converted PyTorch models to Caffe and Caffe2, and implemented for use within our company
- **Neural Architecture Search (NAS)**
  - Reproduced DARTS, Proxyless NAS (Song Han), Auto-DeepLab (Feifei Li) and Random NAS
  - Extended NAS to **dense image prediction**
- **Training Efficiency**
  - Reduced the training time from 28 GPU-days to 4 GPU-days on GTX-1080Ti by using NVIDIA Data Loading Library (**DALI**) without accuracy reduction (Train ImageNet from scratch)
  - Used **Mixed Precision Training** based on *Tensor Cores* and introduced by Volta Generation of GPUs, to enlarge 8x throughput and no accuracy reduction
- **Caffe Parser (2k+ lines of C++)**
  - Developed a C++ library for Caffe parser using Google Protocol Buffers
  - Widely used in our company due to its flexibility

### Work on Semi-Supervised ML

Supervisor: Yujing Wang(MSRA) and Ming Zeng(CMU, Facebook)

July 2018 – Nov 2018

- **Graph Embedding**
  - **Reproduced** papers related to graph embedding, such as DeepWalk, Node2Vec, and Planetoid
  - Proposed a novel semi-supervised approach, **Customized Graph Embedding**, which significantly

improved the performance of clustering and representation

- Submitted a **first-author paper** to AAAI2020

### Work on Computer Vision

Advisor: Professor Weiyao Lin(SJTU)

Nov 2017 – Jun 2018

#### o Face Recognition

- Independently developed a face recognition system by Convolutional Neural Network(CNN) for a commercial applications, such as city security
- **Excellent** performance in both face comparison(95.53% on YTF) and identity verification(99.95%)

### Work on Semi-Conductor Devices

Advisor: Professor Chun Jiang(SJTU)

Jun 2017 – Jun 2018

#### o Photonic Crystals

- Completed **research** on Photonic Crystals; analysed results using **MEEP**(MIT open-source software package) **simulation** experiments; consolidated findings in the **report**: *Dynamic control of optical pulse delay time*
- Honored by Tsung-Dao Lee Chinese Research Program with the title "Distinguished Scholar"
- Selected from the top 3% of applicants to this project supported by Tsung-Dao Lee

## Honors & Awards

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Outstanding Graduate of SJTU (Top 3%, performances over four years are considered)	2018
Honorable Mention of Mathematical Contest in Modeling(MCM), America	2017
Second Prize in National Undergraduate Electronics Design Contest(Shanghai) (Top 10%)	2017
Tsung-Dao Lee Scholarship (Top 3%, sponsored by the recipient of Nobel Prize in Physics)	2017
Ji Hanbing Alumnus Scholarship (Only 1 in my major, honoring academic excellence)	2017
Liu Yongling Fellowship(Hong Kong) (Only 1 in my major, honoring academic excellence)	2017
Academic Excellence Scholarship (Second Class) of SJTU (Top 3 in my major)	2017
The Merit Student of SJTU (Only 1 per year, comprehensive evaluation)	2016
National Endeavor Fellowship of Shanghai Jiao Tong University (Top 1%, national level)	2016
Third Prize in Texas Instruments(TI) Cup Electronic Design Contest (SJTU) (Top 10)	2016

## Conferences, Short-Term Programs, Voluntary and Social Activities

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### Computing in the 21st Century Conferences & MSRA Faculty Submmmit

Invited Audience 2018

### 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

### Tsinghua University(THU) Summer Camp: Nano-OptoElectronics Lab

Certificate as Outstanding participant by Department of Electronic Engineering, THU 2017

### Top China Summer Program: Building an Inclusive Society and Our Responsibility

Team Leader. Certificated by the International Student Center of SJTU. 2016

### Career & Leadership Development Program

Served as Coach. Certified by China Soong Ching Ling Foundation, Liaison Department. 2015

### Shanghai International Marathon

Volunteer. Served thousands of athletes and running enthusiasts from all over the world. 2014 - 2016

## Skills

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- o **Programming:**Python, C/C++, CUDA, Verilog/VHDL, HTML, JS, CSS, Java, Neon,
- o **DL Frameworks:**PyTorch, Caffe, Caffe2; Familiar with Theano, Keras, Tensorflow, MxNet
- o **Interests:** Guitar, Reading, Traveling, Badminton, Biking, Swimming