

# Bitan Hou | Curriculum Vitae

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## Profile

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### Microsoft STC Asia

Full Time Employee, Software Engineer of WebXT [*eXperiences Team*]

Suzhou, China

Sep 2020 – Present

### Deep Motion

Full Time Employee, Deep Learning R&D Engineer

Beijing, China

Nov 2018 – Aug 2020

### Microsoft Research Asia

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

## Preprint

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- **Bitan Hou**, Yujing Wang, Ming Zeng, Shan Jiang, Ole J. MengShoel, Yunhai Tong, Jing Bai.  
Customized Graph Embedding: Tailoring Embedding Vectors to different Applications. [arXiv]

## Work&Research Experience

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- **UX Improvement of Microsoft Web Products (NTP, Bing HP, MSN)**
  - Owned the search experience of NTP (New Tab Page of Edge browser), which is one of the most important experiences, including search box UI, search history management, voice search, and more. Highly increased the user engagement and the revenue
  - Improved the experience of News Feed and Advertisements which matters a lot for revenue.
  - Monitored the healthy status of Bing HP as a DRI Role. Ensured our user base to have the best experience
  - Contributed the web framework migration (from React to Web Component), which highly improved the page performance
  - Contributed the automation test for NTP, including unit tests, integration tests, and visual parity tests
- **User Nurturing Platform**
  - Independently rebuilt the user nurturing platform for NTP, which is a crucial way to promote new features to our users
  - Maintained the stability of the platform, and supported many coachmarks from global teams which brought millions of clicks/downloads of Microsoft products
  - Addressed the pain points of original promotion pipeline, and creatively leveraged the benefits of WPO (Whole Page Optimization) which can generate user's profile with Machine Learning algorithm
- **Data Analysis**
  - Mined the information from vast of users' raw data to help analyze the gain/loss of our new features
  - Mastered various internal tools to process the collected data, which made me an important role for feature iteration in our team
- **Model Acceleration & Deployment (100k+ lines of C++)**
  - Had expertise in 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
  - Familiar with both ARM and x86 architectures, both CPU and GPU instructions for ML Deployment
- **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**)
- Given the theoretical analysis of quantization in different tasks (Cls., Seg., Det., Depth) by using the newest INT8 Quantization feature in PyTorch1.3; Deployed 10+ INT8 models based on TorchScript
- **Deep Learning Framework Development**
  - Got familiar with Google XNNPACK, a highly optimized library of neural network inference operators
  - Developed a lite deep learning framework (inference only) for edge devices deployment which needs strong skill on Google FlatBuffers, memory management, topology optimization, etc.
- **Neural Architecture Search (NAS)**
  - Reproduced DARTS, Proxyless NAS (Song Han), Auto-DeepLab (Feifei Li) and Ramdom 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 through put and no accuracy reduction
- **Graph Embedding**
  - **Reproduced** papers related to graph embedding, such as DeepWalk, Node2Vec, and Plantoid
  - Proposed a novel semi-supervised approach, **Customized Graph Embedding**, which significantly improved the performance of clustering and representation
  - Completed a **first-author paper** in collaboration with MSRA, CMU, UIUC, PKU and SJTU
- **Face Recognition (CNN)**
  - Independently developed a face recognition system for a commercial applications, such as city security
  - **Excellent** performance in both face comparison(95.53% on YTF) and identity verification(99.95%)
- **Photonic Crystals**
  - Completed **research** on Photonic Crystals; analysed results using **MEEP**(MIT open-source 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 program supported by Tsung-Dao Lee
- **Misc.** (All of them are implemented for widely use within our company.)
  - Developed a python package for model conversion between DL frameworks (**10k+ lines of .py**)
  - Self-developed an OpenCV (GPU) package to get ride of redundant dependencies (**2k+ lines of .cu**)
  - Python Binding: Created **100+ bindings** of existing C++ code, using C++ code through python API
  - Developed a C++ library for Caffe parser using Google Protocol Buffers (**2k+ lines of .cpp**)
  - Developed a toolchain for CNN debugging with expertise in python features: hook and decorator

## Honors & Awards

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

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

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

*Invited Audience. One-on-one talk with Kai-Fu Lee and Harry Shum, respectively.*

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

### 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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- **Programming:**Python, C++11/14, CUDA, Verilog/VHDL, HTML, JS, CSS, Java, Neon
- **Dev. Skills:** Linux OS, Git, Modern CMake, GDB, Shell Script(bash, Zsh), Vim, Emacs
- **DL Frameworks:**PyTorch, Caffe, Caffe2; Familiar with Theano, Keras, Tensorflow, MxNet
- **Interests:** Reading, Traveling, Biking, Swimming, Guitar, Badminton