

DIEQIAO FENG

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EDUCATION:

Institute for Interdisciplinary Information Science (IIS), Tsinghua University (THU), Beijing *2012.8-2016.7*

- Bachelor of Science in Computer Science; Major GPA: 3.77/4.0
- 1st Place in National Olympiad in Informatics (top 0.01%), received waiver for the National College Entrance Exam to enter THU
- Fellowship of Tsinghua Xuetang Talents Program 2013, 2014, 2015, 2016 (top 3% in THU)
- 12 years of programming and engineering experience: solid expertise in C++ (>120k lines), C, Python, and various data structures, algorithms and design patterns; experienced in C++, C, Python, Lua, Java, Javascript, MATLAB, HTML and SPSS
- Graduate Record Examination (GRE) Quantitative Reasoning Score: 170 (top 1%)

Chinese University of Hong Kong (CUHK), Hong Kong *2015.1-2015.2*

- CUHK Undergraduate Winter School Program, supervised by Professor Andrew Chi-Chih Yao

Awards

- Gold medal in 28th National Olympiad in Informatics (NOI) *Top 1 in China, 2011.8*
- Current Topcoder Algorithm Competition Rating: 2298 *Highest world rank: 43*
- Current Codeforces Algorithm Competition Rating: 2520 *Highest world rank: 23*
- Gold medal in ACM International Collegiate Programming Contest (ACM-ICPC) *Top 3 in Tianjin Region, 2012.10*

RESEARCH EXPERIENCE:

Lung Nodule Detection Using Fully Convolution Neural Networks | Research Assistant *2016.2-2016.6*

Advisor: **Wei Xu**, Assistant Professor, Institute for Interdisciplinary Information Science, Tsinghua University

- Extracted and refined nodule features based on skip architecture; evaluated with LIDC/IDRI dataset (a completed reference database of lung nodules on CT scans); achieved average sensitivity of 90% and false positive 4 per scan, which is the best result among related works
- Took predicted locations as prior knowledge and added all of them to the original data, which greatly improved the prediction of detailed nodule information
- Contributed to a first-author paper to be submitted to CVPR (International Conference on Computer Vision and Pattern Recognition) 2017

Difficulty Discrimination Using Cooperative Networks | Research Assistant *2016.7-2016.10*

Advisor: **Jian Sun**, Chief Scientist, Megvii & Face++

- Observed the uneven difficulty distribution of training data; the majority of data only requires simple features to be discriminable
- Proposed a parallel cooperative network to estimate the difficulty of every sample, directed the origin network to focus on easy samples, and coordinated two networks to cooperate with each other
- Achieved a whole-model speedup ratio of $3\times$ on a large network trained for ImageNet without decreasing top-5 error rate

Specific Deep Neural Network Deployment for Hurricane Hardware | Research Assistant *2016.9-Present*

Advisor: **Wei Xu**, Assistant Professor, Institute for Interdisciplinary Information Science, Tsinghua University

- Led a group to design specific optimized DNN framework for Hurricane (next generation chips using vector-fetch accelerator from UC Berkeley)
- Used vectorization and parallelization features provided by Hurricane to achieve highly accurate real-time face detection

Data Mining in Bioinformatics | Research Assistant *2015.7-2015.9*

Advisor: **Nir Yosef**, Assistant Professor, Electrical Engineering and Computer Sciences, University of California, Berkeley

- Obtained knowledge of statistical analysis methods in bioinformatics, conducted significance tests on multiple check experiments
- Applied SVM method to discriminate smokers and non-smokers by observational data collected from buccal and nasal cells
- Wrote a web application based on Flask to provide multiple analytical tools for data from National Center for Biotechnology Information

Low Distortion Embeddings for Edit Distance | Research Assistant *2014.9-2015.1*

Advisor: **Periklis Papakonstantinou**, Assistant Professor, Institute for Interdisciplinary Information Science, Tsinghua University

- Consulted papers and literature about embedding and matrix theory, learned related knowledge of embedding string edit distance into L^p space, understood that the lower bound and the upper bound are not tight
- Improved the upper bound from $2^{O(\sqrt{\log d \log \log d})}$ to $2^{O(\sqrt{\log r \log \log r})}$, where d is the string length and r is the number of ones
- Wrote code to apply a divide-and-conquer algorithm about embedding; achieved better performance than dynamic programming

TUNet: Campus Software Development *2013.3-2013.8*

Advisor: **Thomas Moscibroda**, Chair Professor, Institute of Interdisciplinary Information Sciences, Tsinghua University

- Studied IP conflict problems on campus; learned the principle of IP address distribution when one account is logged in on multiple devices
- Developed a mobile app on Android, automatically managed MAC addresses, improved response speed by 30%, and modified user interface for better user experience
- Learned and practiced agile development in a small group, made accounts in campus for increased log-in safety

CUHK Winter School 2015*2015.1-2015.2*Advisor: **Prof. Andrew Chi-Chih Yao & Andrej Bogdanov**

- Studied conflict in MPI communication, employed probability theory to improve communication model, and reduced the chance of conflict
- Proceeded graphic transformation to decide the existence of triangle; extended this method to quadrangle

Mathematical Contest in Modeling 2015 | Leader of the Group*2015.2*

- Learned infectious disease transmission model (SIR model), combined it with small world model to approximate the spread process of virus in one city and reduced the complexity of the problem in the real world
- Wrote efficient code to simulate the status of infection in a city, produced a result similar to real data within the following 30 days

Computing Theory Research at the Chinese Academy of Sciences*2012.10-2012.12*Advisor: **Xiaoming Sun**, Professor, China Academy of Sciences

- Reduced the number of comparisons from linear level to logarithmic level in some cases when merging two ordered arrays, gave a tight upper bound for these cases
- Analyzed the upper bound of comparisons in general cases

WORK EXPERIENCE:

Megvii Inc.*2015.10-2016.9*

- Studied and worked on problems about deep learning, specifically in network structure; collected numerous personal insights; mastered most methods and frameworks about convolutional neural networks
- Applied bit operation method on fully convolutional networks; accelerated the course of training with negligible performance loss
- Designed a new structure to utilize information from intermediate layers; improved layer-wise prediction accuracy and speed

Beijing Sensetime Technology LTD.*2015.1-2015.3*

- Applied spatial pyramid pooling in neural networks to recognize 101 different kinds of Chinese foods with different scales
- Used the data obtained from European Conference on Computer Vision (ECCV) to conduct a horizontal comparison with other companies, improved accurate recognition rate from 41% to 63%

EXTRACURRICULAR ACTIVITIES

- Organized 18th Sogou Cup Artificial Intelligence Competition, the biggest AI competition in Tsinghua University
- Participated in developing the competition platform since 2013; our competition platform is still in use
- Developed the notion integral system in maTHmU since 2012, which aims to build our own kernel of Mathematica

SKILLS & INTERESTS

Computers: C/C++, Matlab, Java, Python, Ruby, \LaTeX **Language:** Mandarin Chinese (native), English (fluent, GRE total score: 328)**Interests:** Machine Learning, Algorithm Competition, Computing Theory