

GONG, LINYUAN

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Education

Turing Class, B.S. in Computer Science, School of EECS, Peking University Sep 2016 - Jul 2020

- **GPA:** 3.80/4.00 (Top 3.67%). **GPA** (Past 2 Years): 3.86/4.00. **GRE:** 340 (*full score*) + 4
- **Selected Courses:** Discrete Maths II (4.00), Theory of Computation (4.00), Algorithm Design and Analysis (Honor) (3.97), Stochastic Processes (3.97), Advanced Algebra II (3.91), Convex Optimization and Analysis (3.81), Parallel Computing (3.97), Probability and Statistics (3.95)

Research Interests

- **Self-Supervised Pre-training:** Develop new self-supervised language pre-training tasks. Explore self-supervised learning for different forms of data, such as time series or knowledge graphs.
- **Machine Learning in Healthcare:** Diagnosing, typo correction, insurance code prediction, and event prediction based on both clinical texts and structured data.
- **Other Applications of ML:** ML in games, music, social media analysis, education, etc.

Publications

- **Efficient Training of BERT by Progressively Stacking** *ICML 2019*
Linyuan Gong, Di He, Zhuohan Li, Tao Qin, Liwei Wang, Tie-Yan Liu
- **Microsoft Research Asia's Systems for WMT19** *ACL 2019 on Machine Translation*
Yingce Xia, Xu Tan, Fei Tian, Fei Gao, Weicong Chen, Yang Fan, Linyuan Gong, Yichong Leng, Renqian Luo, Yiren Wang, Lijun Wu, Jinhua Zhu, Tao Qin, Tie-Yan Liu

Research & Professional Experience

- **Machine Learning Group, Microsoft Research Asia** *Oct 2018 - Jun 2019*
Research Intern, Mentored by Di He, Tao Qin, and Jiang Bian.
 - Researched self-supervised pre-training for natural languages.
 - Reproduced *BERT* before Google released its code, wrote 6,800 lines of code.
 - Proposed a faster and more computationally efficient pre-training algorithm for *BERT*, ran large-scale experiments for 10,000 GPU-hours, published our results on *ICML 2019*.
 - Paper cited by Google *ALBERT*, codebase used by Bing team to train question-answering systems.
 - Ranked first in four tasks of *WMT19* machine translation competition with our new technologies.
- **Machine Learning Department, Carnegie Mellon University** *Jun 2019 - Sep 2019*
Research Intern, Advised by Pradeep Ravikumar.
 - Researched the application of machine learning in healthcare.
 - Developed and evaluated various deep learning methods for clinical abbreviation expansion.
 - Designed a novel self-supervised pre-training algorithm for this task, which outperforms the state-of-the-art on multiple datasets without structured knowledge bases, submitted to *ACL 2020*.

- **Key Lab of Machine Perception (MOE), Peking University** *May 2019 - Now*
Research Intern, Advised by Liwei Wang.
 - Proposed a Gram-Gauss-Newton optimization algorithm that converges better than SGD/Adam.
 - Sped up training by 3.5x by writing CUDA kernels, designed a communication algorithm that enables large-scale distributed training.
 - Earlier results on small regression tasks: <https://arxiv.org/abs/1905.11675>
- **Big Data Mining Group, Microsoft Research Asia** *Jul 2018 - Oct 2018*
Software Development Intern, Mentored by Mu Guo and Börje F. Karlsson
 - Developed and maintained *EDI*, an AI assistant widely used for booking meeting rooms in Microsoft.

Honors and Awards

- National Olympiad in Informatics (NOI), China, Gold *Jul 2015*
- Mathematical Contest in Modeling®(MCM), Finalist (7th place) *Feb 2018*
- Star of Tomorrow Award (Top 10% Interns), Microsoft Research Asia *Jun 2019*
- Leo Koguan Scholarship (Top 4%) *Sep 2017*
- Tang Lixin Scholarship (Top 1%) *Sep 2018*

Services

- Teaching Assistant for *Data Structures and Algorithms*, Peking University *Fall 2018*
- Assistant Coach for Zhejiang Team in NOI 2016 *Spring 2016*

Skills and Interests

- **Software Development & Engineering:** C/C++ (7.5 years), CUDA, C#, Java (Android), JavaScript (Web), SQL, Git, Linux/Windows server maintenance, DApp on blockchains
- **Data Science & Research:** Python/Numpy, PyTorch (12,000+ lines), TensorFlow (5,000+ lines), Keras, Matlab®, L^AT_EX
- **Academic English:** TOEFL - 114 (Speaking 27). **GRE** - 340 (*full score*) +4
- **Interests:** Violin, Music Production; Video Production; Game Modding; Orienteering