

CHENG QIAN

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EDUCATION

Tsinghua University, Undergraduate

Sep 2020 – Present

B.E. in Computer Science and Technology

- **GPA: 3.89 / 4.00.**
- Selected Courses of **A & A+**: Linear Algebra, Introduction to Complex Analysis, Foundation of Object-Oriented Programming, Software Engineering, Introduction to Artificial Intelligence, Introduction to Modern Cryptography, Fundamentals of Computer Graphics, A General Introduction to Economics, Writing and Communication.
- A member of **THUNLP** (THU Natural Language Processing Group), advised by Associate Professor Zhiyuan Liu.



PUBLICATIONS

- Yujia Qin*, Cheng Qian*, Jing Yi*, Weize Chen, Yankai Lin, Xu Han, Zhiyuan Liu, Maosong Sun, Jie Zhou. Exploring Mode Connectivity for Pretrained Language Models. EMNLP 2022.
- Cheng Qian, Yujia Qin, Xu Han, Zhiyuan Liu, Maosong Sun, Jie Zhou. CLoP: Compatible Tuning for Lifelong Pre-training. Applying for an invention patent. Related paper in submission.



RESEARCH EXPERIENCES

Exploring Mode Connectivity for Pre-trained Language Models

Mar 2022 – Jul 2022

- Directed by Associate Professor Zhiyuan Liu, THUNLP.
- Analyzed the geometric connections of different minima in loss landscape through the lens of mode connectivity, which measures whether two minima can be connected with a low loss path.
- Explored how various hyperparameters and training data affect PLMs' mode connectivity; Discovered the role of pre-training in facilitating mode connectivity and pulling task boundaries closer; Investigated into how PLMs task knowledge change along the connected path quantitatively.
- Co-first author. Accepted by EMNLP 2022 main conference.
- Project established in THU *Student Research Training Program*.

CLoP: Compatible Tuning for Lifelong Pre-training

Aug 2022 – Present

- Directed by Associate Professor Zhiyuan Liu, THUNLP.
- Formulated the task of compatible tuning as PLM continually acquire fresh knowledge from emerging data, and explored how to make earlier adapted weights compatible with subsequent upgraded PLMs.
- Explored the parametric connections among continually pre-trained models; Proposed CLoP, which enables compatible tuning in a data-efficient and training efficient way; Experimented on various NLP tasks and demonstrated the superiority of CLoP; Construct the first benchmark regarding to the field of compatible tuning.
- Co-first author. Applying for an invention patent. Related paper in submission.
- Project selected to THU *Undergraduate Academic Advancement program* and won ¥ 30K support.

THUPat: A Convenient Campus Helper

Mar 2022 – Jun 2022

- Directed by Associate Researcher Chun Yu, *Theory and Practice of Human Computer Interaction* course project.

- Proposed “pat” for the first time as the medium in human-phone interaction. Built an open source android software THUPat that can help with various kinds of campus events via simply patting the phone.
- Collaborator. Software released in THU and benefited the campus community.

Quantum Automata: Capability and Efficiency

Jul 2022 – Aug 2022

- Directed by Professor Zhengfeng Ji and Professor Mingsheng Ying, *Topics in Quantum Computing* course project.
- Defined the efficiency of quantum automata from 3 different perspectives with respect to acceptance probability, space and time; Proposed an algorithm that can effectively optimize quantum automata’s acceptance probability, applying the knowledge from neural network.
- First author. Course thesis won high recognition.



SELECTED AWARDS & HONORS

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| ➤ December-9th Scholarship, highest scholarship in Dept. of CST, 2 out of 180 . | 2021 |
| ➤ Volunteering & Social Survey Excellence Scholarship, Dept. of CST, 2 out of 180 . | 2022 |
| ➤ Awards of Excellent Student Cadre, Tsinghua University. | 2021 |
| ➤ Second Prize in National Undergraduate Physics Competition, Beijing Physics Society. | 2021 |
| ➤ Third Prize in THU Challenge Cup Academic Competition, Tsinghua University. | 2022 |



ACTIVITIES

Social Survey & Voluntary Work

- Olympics Family Assistant in Beijing Winter Olympic Games: served as the personal assistant of Ivo Ferriani, president of IBSEF, providing help in travel & conference arrangements. 2022
- ShuJi Summer Educational Support Program: provided educational help for students in undeveloped areas, university-level gold award, vice leader. 2021
- Repay Alma Mater Program: gave CS academic lectures to students in high school. 2021

Student Organization Work

- In department’s Students’ Union: organized department’s propaganda work; clipped various departments’ promotional videos. 2021-2022
- In department’s Science Association: held lectures with alumni entrepreneurs; in charge of department’s Challenge Cup and series of academic events. 2021-2022

Interests

- Sports: orienteering, swimming, badminton, tennis.
- Others: poetry, I-go.



SKILLS

English Skills

- TOEFL 113/120 (Reading 30, Listening 30, Speaking 24, Writing 29).
- GRE Verbal Reasoning 162/170, Quantitative Reasoning 170/170, Analytical Writing 4/6.

Technical Skills

- Proficient in C/C++, Python(PyTorch), LaTeX, Linux, Java, React.
- Familiar with various neural networks and state-of-the-art deep learning techniques.