

# CHANG CHEN

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## RESEARCH INTERESTS

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My research interests include efficient machine learning, particularly efficient training and inference. Recently, I have focused on quantization.

## EDUCATION

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**Bachelor of Computer Science and Technology**, Tsinghua University Sep 2022 - June 2026(Expected)  
**Core Courses:** Calculus A(1), Calculus A(2), Linear Algebra, Software Engineering, Programming and Training, Data Structures, Probability and Statistics, Introduction to Computer Systems, Formal Languages and Automata, Introduction to Artificial Intelligence, Cybersecurity Fundamentals

## RESEARCH EXPERIENCE

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**Research Intern** Intelligent human-computer interaction center of the Institute of Artificial Intelligence, Tsinghua University Advisor: [Prof. Yuntao Wang](#), [Prof. Yuanchun Shi](#) Sep 2023 - Sep 2024

### Automated Grading Hemifacial Spasm Using Smartphone Cameras

- Involved in proposing a novel HFS grading system, which addresses the vagueness and non-quantifiability of traditional medical grading systems that rely mostly on the accumulated experience of doctors.
- Designed part of an algorithm to identify and score the levels of patients' facial asymmetry and facial spasm. The algorithms were tested on the dataset, achieving a detection accuracy of 88% and a mean absolute error (MAE) of grading of 0.42.
- Identified measurable three facial features for assessing and grading HFS.

**Research Intern** Statistical Artificial Intelligence & Learning Group, Tsinghua University, Advisor: [Prof. Jianfei Chen](#), [Prof. Jun Zhu](#)

Sep 2024 – Present

### Identification of Sensitive Weights through Post-Quantization Integration

- Involved in a study on the accuracy of sensitivity metrics used in post-training quantization (PTQ) of large language models (LLMs).
- Proposed a novel sensitivity metric, Post-quantization Integral (PQI), which significantly outperforms traditional gradient-based and Hessian-based metrics by accurately estimating the impact of quantization on the model's loss function.
- Developed and implemented the ReQuant framework, leveraging PQI to enhance post-quantization accuracy, achieving a 2.66 perplexity improvement on Llama 3.2 1B model using the QTIP method.
- Conducted experiments on state-of-the-art LLMs, demonstrating the superior performance of ReQuant in comparison to traditional PTQ techniques like AWQ and SqueezeLLM.

## PUBLICATION

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- "Automated Grading Hemifacial Spasm Using Smartphone Cameras", Ka l Chan, Bo Hei, Linghao Meng, Ruen Liu, Yuntao Wang, Chang Chen, Qingpei Hao and Yuanchun shi, in the *IEEE International Conference on Ubiquitous Intelligence and Computing (2024)*. [\[PDF\]](#)

## PROJECTS

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### Private messaging platform

- Course project of Software Engineering
- Developed and deploy a messaging platform to enable communication between users, utilizing JavaScript, Python, and Django, Docker
- Provided features for finding other users, making connections, and chatting privately or in groups.

## News App

- Course project of Programming and Training,
- Developed an app to deliver news to users, providing essential app functionalities, using Java.

## Develop Best Go-moku strategy

- Course project of Introduction to Artificial Intelligence
- Developed an algorithm by implementing the Monte Carlo algorithm to find the optimal strategy for Go-moku, maximizing the win rate when competing against robots or other players.

## SKILLS

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- *Programming:* C++, Python, Pytorch, JavaScript, Java
- *Language:* Mandarin(Native),English(Fluent)

## OTHER EXPERIENCES

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- *Vice President:* in the Activity Department of Tsinghua University Student Algorithm Association.  
Mar. 2024 - Present
- *Volunteer:* Organized a seminar to impart learning experiences to young students, and created a public account(wechat official account) on which to volunteer to share knowledge and methods,every single post has been read by over 100 persons.  
Jan 2023 - Feb 2023