ZIQI WEN

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EDUCATION

University of California, Santa Barbara, *Santa Barbara, CA*
Doctor of Philosophy in Computer Science *Sept. 2024 - May 2029*
Advisor: Prof.Miguel Eckstein

Carnegie Mellon University - School of Computer Science, *Pittsburgh, PA*
Master of Computational Data Science | **GPA:** 3.87/4.0 *Aug. 2022 - May 2024*
Selected Coursework: Large Language Models, Deep Learning System, Cloud Computing, Distribute System

Zhejiang University *Hangzhou, China*
Bachelor of Engineering in Computer Science and Technology | **GPA:** 3.87/4.0 *Aug. 2018 - Jun. 2022*
Minor in Psychology | **Minor GPA:** 4.0/4.0

Imperial College London *Remote*
Data Science Summer School *Jul. 2020 - Aug. 2020*

RESEARCH EXPERIENCE

Center for the Neural Basis of Cognition & Computer Science Department, Carnegie Mellon University
Shape and texture bias in computer vision models and their benefits *Feb. 2023 - Present*
Supervisor: Prof.Tai Sing Lee

· **Emergence of Shape Bias in Convolutional Neural Networks through Activation Sparsity**
- Enforcing the sparse coding constraint using a non-differential Top-K operation can lead to the emergence of structural encoding in neurons in convolutional neural networks.
- The emergence of shape bias benefits for different network structures with various datasets on different tasks. (e.g. object recognition, image synthesis)
- Accepted as **NeurIPS 2023(oral)** (top 2%)

· **Does resistance to style-transfer equal Global Shape Bias? Measuring network sensitivity to global shape configuration**
- Show that stylized trained neural network still focus on local feature rather than global shape.
- Provide Distorted Shape Testbench as an alternative measurement of global shape sensitivity, evaluate both human and multiple deep learning models, challenge the conclusions from style transfer-based evaluation.

Human-Computer Interaction Institute, Carnegie Mellon University
Analysis of Online Interpersonal Conflict *Apr. 2023 - Present*
Supervisor: Prof. Robert E. Kraut & Prof. John M. Levine

· Analysis how interpersonal conflict influence the consequent behavior of the users in Wikipedia Talk Page and their participation in the conversations based on the WiKiDetox dataset.

State Key Laboratory of CAD & CG, Zhejiang University
Efficient Neighbor Gathering Methods for Large-scale Point Clouds *Apr. 2021 - Dec. 2021*
Supervisor: Prof. Zhaopeng Cui

· Optimize the neighbor gathering in Dynamic Graph CNN by skipping redundant gathering operations and applying Fixed Radius Nearest Neighbors (FRNN) to replace KNN.
· Design an efficient architecture for the optimized model using One-Shot Neural Architecture Search to enhance efficiency on tasks such as point cloud segmentation and classification on large-scale datasets.
· Speeds up the baseline **4 times** and reduces memory cost by **34%** with similar accuracy in the same testing condition. Able to process near million points, which is **20 times** the maximum processing capacity of baseline.

PUBLICATIONS

Ziqi Wen, Tianqin Li, Tai Sing Lee. *Does resistance to style-transfer equal Global Shape Bias? Measuring network sensitivity to global shape configuration.* ICLR 2024 Workshop Re-Align.

Tianqin Li, **Ziqi Wen**, Yangfan Li, Tai Sing Lee. *Emergence of Shape Bias in Convolutional Neural Networks through Activation Sparsity*. **NeurIPS 2023(Oral)**.

TEACHING

Carnegie Mellon University
***15386/686 Neural Computation**: Teaching Assistant* *Spring 2024*

ACADEMIC PROJECTS

Twitter Analytics Web Service (Java) *Carnegie Mellon University | Spring 2023*

- Design, build, and deploy a performant, reliable, scalable and fault-tolerant cloud native web service that uses the microservice model and the REST interface to respond to queries that require running an analytics job on a large (1.2TB) Twitter data set within a limited budget.
- Use Vert.X as application framework, deploy on AWS, use Aurora Mysql as the database engine, reach over 18000 RPS within 1.2$ per hour budget.

Distributed Bitcoin Miner (Go) *Carnegie Mellon University | Fall 2022*

- Implement a self-defined protocol for providing reliable communication with simple client and server APIs on top of the Internet UDP protocol, which is reliable and ensure integrity, named Live Sequence Protocol (LSP).
- Implement a simple distributed bitcoin miner based on LSP, consisted of server, client and miner.

MiniSQL (C#) https://github.com/Banyc/MiniSQL *Zhejiang University | Spring 2021*

- Implemented a standalone and functioning database management system from scratch that supports a subset of SQL with B+ Tree indexes.

AFSK KISS Modem (C++) *Zhejiang University | Fall 2020*

- Bulit a KISS modem following AFSK protocol using STM32f051 and STM32f407 microcomputer.
- Applied the Fast Fourier Transform (FFT) algorithm to demodulate.

Simple Pascal Compiler (C++) *Zhejiang University | Spring 2021*

- A compiler which implement all the function of Pascal except Object and Union.
- It is well-functional to compile another compiler written by Pascal.

3D Graphics Engine (C++) *Zhejiang University | Fall 2020*

- Developed an OpenGL-based 3D graphics engine, which supports model import, real-time lighting and shadows, NURBS surface and L-tree system.

SKILLS

Programming Language: Python, C, Go, C++, C#, Java, Matlab
Cloud Computing Service: Amazon Web Services (AWS), Microsoft Azure
Microservices Development: Docker, Kubernetes
Embedded System Development: STM32 microcomputer, Raspberry pie
Distributed Programming Framework: Kafka, Samza, Spark
Database engine: Mysql, HBase, Neo4J, MongoDB

HONORS & AWARDS

NeurIPS 2023 Oral
Outstanding Graduates of Zhejiang University, 2022
Outstanding Graduation Project of Zhejiang University, 2022