TINGHAO XIE

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🎓 EDUCATION

Zhejiang University (ZJU), Zhejiang, China   09/2018 – 06/2022 (expected)

B.E. in Computer Science and Technology (CS)
- **GPA**: 3.99/4.00 (92.13/100)
- **Rank**: 1/186

University of Oxford, Oxford, United Kingdom   10/2021 – 06/2022 (expected)

Visiting Student, Computer Science

👥 EXPERIENCE

Backdoor Restoration and Certification   05/2021 – Present

Remote Intern   in **ALPS Lab, Pennsylvania State University, United States**

Advisor: Prof. *Ting Wang*
- Proposed an effective and possibly state-of-the-art way for trigger restoration
- Implemented tools for certifying the (non-)existence of backdoors (universal perturbations) based on LiRPA
- Formed an optimizable method to tighten the backdoor certification bounds
- Studied NN verification, backdoor attacks and defenses

Subnet Replacement: Deployment-stage backdoor attack against deep neural networks in gray-box setting   09/2021 – Present

Collaborator   with **Zhuque Lab, Tencent, China**

Advisor: Principal Researcher *Jifeng Zhu*
Project Leader: Ph.D. Student *Xiangyu Qi* at Princeton
- Helping experiment subnet replacement attacks on various DNN architectures

Enchecap: An Encrypted (Enclave-based) Heterogeneous Calculation Protocol based on Nvidia CUDA and Intel SGX   04/2020 – 05/2021

Undergraduate Intern   in **Intelligent Computing and System Lab, Zhejiang University, China**

Advisor: Prof. *Jianhai Chen*, Lec. *Rui Shen*
- Designed and implemented the protocol into a library and a demo, available ✆**here**
- Studied heterogeneous calculation and conducted research about secure system schemes involving TEE
- Summarized protections with Intel SGX and secure issues around GPU

The QuEST Challenge   02/2020 – 03/2020

Member   in **SuperComputing Team, Zhejiang University, China**

An optimization task on QuEST, an open source, hybrid multithreaded and distributed, GPU accelerated simulator of universal quantum circuits in ASC Student Supercomputer Challenge 2020-2021.
- Profiled QuEST's algorithm and provided insights into the source code
- Analyzed QuEST's performance and hotspots and optimized QuEST on GPU by 4.7%

</> SELECTED PROJECTS

NaiveVQA: A Visual Question Answering model   07/2021

We reimplemented the model of the paper *Show, Ask, Attend, and Answer: A Strong Baseline For Visual Question Answering* with both **MindSpore** and **PyTorch**, available ✆**here**.
- Trained and achieved 40.6% overall accuracy on a small VQA 2.0 sub-dataset provided by the course
- Translated the PyTorch implemented model into a MindSpore (a new AI framework) implementation

- Visualized the model's performance

RCC: A <u>R</u>emarkable/<u>R</u>etarded <u>C</u>-like <u>C</u>ompiler   05/2021 – 06/2021

We built a C-variant language complier with FLEX and BISON for the frontend, LLVM for the backend, available ⌗**here**.

- Modified standard C EBNF and built up the frontend
- Completed an abstract syntax tree for code generation
- Implemented the intermediate code generation features including *type binding*, *structure* and *array*

Tron: A 3D Graphic Engine Based on WebGL   12/2020 – 01/2021

A 3D engine based on native WebGL with a wonderful flying game demo, available ⌗**here**.

- Designed the representation pattern and data structures for 3D scenes
- Completed voxel, material and texture expression modules
- Wrote GLSL shader codes involving fogs and the animated sky
- Implemented cross-platform interaction and front-end web pages

Other Course Projects   2020 – 2021

- **AI for Reversi**: an AI for the game Reversi based on the MCTS method
- **Facial Recognition**: a PCA model for recognizing and restoring human faces
- **Garbage Classfication**: a ResNet model for garbage images classification, achieving 91.5% accuracy
- **Robot in Maze**: an AI capable of walking through a random maze, implemented with DFS, traditional reinforcement Q-Learning, Deep Q-Learning methods respectively
- ⌗**MiniSQL**: A Single-user Database Management System (SQL Engine)
- ⌗**HWMS**: A Homework Management System
- ⌗**Research on the Texture Packing Problem**
- **A MIPS CPU on FPGA**: An SoC on Xilinx FPGA and a pixel game in MIPS assembly

🏛 CAMPUS ACTIVITIES

Member, SuperComputing Team (ZJUSCT)   09/2019 – 02/2021

- Studied and practiced with high-performance computing
- Obtained the certificate of competency of Accelerated computing basics – CUDA C/C++ from Nvidia Deep Learning Institute on 07/14/2019
- Participated in ASC Student Supercomputer Challenge 2020-2021

Member, DFM Street Dance Crew   03/2019 –- 09/2019

- Attended the Danqing Dance Competition 2019, as one of the Hiphop dancers
- Attended the Zhejiang University New Year's Eve Showcase 2020, as one of the Hiphop dancers

♡ HONORS AND AWARDS

The 2nd Class Prize in ASC20-21 Student Supercomputer Challenge   01/2021
Narada Scholarship (1/372)   2019 – 2020

⚙ SKILLS

- **Programming**: C/C++, Python, JavaScript, CUDA, Verilog, Shell, MATLAB, ActionScript, HTML
- **Software**: LaTeX, Vivado, Adobe Photoshop, Adobe Premiere Pro, Adobe After Effects, Adobe Audition
- **Languages known**: English(fluent), Chinese(native), Cantonese(native)
- **TOEFL iBT**: Total 110/120, Reading 29/30, Listening 30/30, Speaking 26/30, Writing 25/30
- **GRE General Test**: Verbal 154/170, Quantitative 170/170, Analytical Writing 3.5/6
- **Hobbies**: Dance(Hiphop, House, Breaking, Choreography), Swimming, Basketball, Fitness, Billiards

Latest update date: 10/18/2021