Peter HU

University of Cambridge | ***Jardine Scholar***
Computer Science Part IA

CONTACT
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LinkedIn | Github | Portfolio

What I really enjoy is the beauty of CS and its application in real life. I am open to new fields of area and enjoy exploring unknown features.

SKILLS

Basic Skill ·C ·C++ ·Java ·OOP ·CMake ·Gdb ·Algorithms and Data Structure ·Functional Programming (OCaml)
Operating System Process Scheduling, Memory (Segment, Page, VM), I/O, File, Linux ·bash/shell ·Digital Electronic
Data Sci ·Python ·NumPy ·Machine Learning ·Deep Learning ·Natural Language Processing ·Computer Vision
Graphics ·Vulkan ·Graphics Pipeline ·GPU driver ·Game Engines/ Unreal Engine Unity ·C#
Front-End ·HTML/ CSS ·React ·Flutter ·Latex *Back-End* ·Database ·SQL ·NoSQL
Math ·Calculus ·Linear Algebra ·Discrete Math ·Probability and Statistics ·Abstract Algebra ·Topology (basic)
Development Tools git (Version Control), CI/CD pipeline, Docker, Visual Studio, VS Code, Pycharm, Github/Gitlab, IntelliJ IDEA.

WORK EXPERIENCE

Graphics Researcher Huawei Technologies R&D (UK) Ltd, Cambridge *Internship* *May 2023 - Present*
· Finding the "Secret Sauce" of the Next-Generation Development, which is really exciting!
· Conduct independent Computer Graphics research, involving scientific paper and literature reading, of both the classic and novel algorithms. Implement and verify such algorithms with comparisons.
· Assist the research team with setting up the simulation environment, conducting the investigation and data analysis.
· Series Knowledge sharing sessions about my research topic, with detailed and self-contained material. (Presentation slides over 120.)

GPU Software Engineer Huawei Technologies R&D (UK) Ltd, Cambridge *Internship* *Dec 2022- May 2023*
· C++, CMake, Gdb, Git version control , CI/CD pipeline, CMake, hands-on experience on Linux server, etc.
· Introducing independent full automation tools in the project, reducing error rate to nearly 0%. Tool
· Familiar with workflow of GPU industry, Vulkan graphics API; Projects on *GPU driver* and verification, Game Engines (UE4).
· Working and collaborating with colleagues, like helping fixing C++ build or link errors.

EDUCATION

University of Cambridge *Computer Science, Undergraduate* *Oct 2022- Present*
· *Merit-based, fully funded Jardine Scholarship*

Xiamen University *Software Engineering, Undergraduate(First Year)* *Sep 2021-June 2022*
Top 1 academic institution in Southern China, Double First-class University, Project 985, 211.
· *GPA: 3.91 / 4.0, rank 1 / 173 (first term), 88/100 (overall) · Class Rep, ACM Team training.*

Nanyang Model High School *Sep 2018–June 2021*
· *Physics Rep, Leader of a research project.* · *Awarded ShuPing Scholarship twice*

HONORS AND AWARDS

UK Tech Arena Gold Medal with *£7000* [C and C++, Compression, Concurrent] *10 Oct-26 Nov 2022*
Engineering + Research *Learning from scratch in a month, digesting lots of papers and source code available, like RFC1951, etc.*
· Responsible for implementation & improvement of LZSS. Engaging in pre-processing, serialization with teammates.
· Optimization using C pointers, bitwise operators & hash tables. GPU optimization: Branch Prediction.
· Multi-threading, Parallelization, Concurrent Processing. Project | Blog
· In a team of 4, Leading the team and communicate with other teammates.

Top 2 Team in Mercuria Hackathon 2022 [Python, Data Analysis, Route-Planning] *16 Dec-18 Dec 2022*
Using data analysis to accelerate the energy transition and reduce the carbon emissions of the maritime industry.
· *Networking and collaborating with senior engineers, excellent undergraduate, Master and PhD students from all around the Europe.*

Jardine Scholarship, issued by Jardine Foundation *Feb 2022*
Merit-based, fully-funded Scholarship during my Undergraduate at University of Cambridge

Adolescents' Science and Technology Innovation Contest Third Place *Apr 2020*
Research+ Thesis issued by Shanghai Association for Science and Technology, Shanghai Municipal Education Commission
· *Deep research into the phenomenon of tire-locking, including why it may happen and its pros and cons using Force Analysis.*
· *Introduced the Anti-lock braking system into our research by our mentor. Self-made physical simulation test for tire-locking.*

Accepted for Publication Twice [English Essays in Shanghai Student Post] *Oct 2018, May 2019*
· *Topic: Effective Ways to Overcome Obstacle in Study, Campus Life without Snack Stores.*

PROJECTS AND ASSIGNMENTS

Operating System *[MIT 6.S081]* Project *Oct 2022 -Mar 2023*
· Programming in kernel mode and user mode of Unix Version 6 (v6), implemented for a modern RISC-V multiprocessor.
· Implement Unix utilities functions, System Call. Understanding its Process Scheduling, Memory (Segment, Page, VM), I/O, File.

Database Design Project (C++) *[CMU15-445 Project]* Project (Github) | Blog *Aug-Oct 2022*
· Memory Management, including Buffer Pool Management System, Replacement policy: LRU
· Concurrency: implement the Parallel Buffer Pool Manager.
· Engineering and code style: Using C++ STL, Google C++ Style Guide

Computer Graphics (C++, OOP, OpenGL) *[MIT6.837 Assignment]* Project| Blog *Jul-Sep 2022*
· Ray casting, normal visualization, rendering, voxel rendering, super sampling and 3D
· Huge OOP project, with 3D objects, light, camera classes. Building over 20 C++ source files from scratch.
· Composite design pattern for 3D objects class hierarchy with transformation.

Machine Learning and Real-world Data (Python) *[Cambridge Part IA]* Project (Github) | Blog *Jan-Mar 2023*
· Text Classification using ML with improvements, including Naive Bayes classifier, Cross-Validation, NLP, HMM

INTEREST AND EXTRACURRICULAR ACTIVITIES

Music, Yoga, Gym, Helping others etc. | Society Joined: Ethics in Mathematics | Macro & Micro, Money Banking

Appendices A: Other *Interesting* Projects

Engineering + Research

LZSS with Concurrent Demo *@ UK Tech Arena 2022* Project *10 Oct-26 Nov 2022*
- · A nicer and easy-to-follow way of understanding FastLZ77
- · With improved 6-level / concurrent LZSS Compression in different branches
- · With step-by-step explanation, with help from *RTC1951*, breakpoint debugging feature and inspecting the related variables.

AI and Data Science (Python)

Artificial Intelligence *[Stanford CS229]* Project (Github) *Oct 2022 - Present*
- · Linear classifiers (Logistic Regression, GDA), Stochastic Gradient Descent, L1 L2 Regularization, SVM

Computer Vision *[Stanford CS231n]* Project (Github) *Jan 2023 - Present*
- · Python, Numpy, kNN, Softmax, SVM classifier, Cross Validation

C, C++, OOP

Multifunctional Supermarket Management System ***[C++, OOP]*** Project | Blog *Apr 2022*
- · Inheritance, polymorphism (Operator Overloading); Read/Write Files, etc

Typing Game (***C* & EasyX**) Project (Github) | Blog *Dec 2021*

Utility Tools

URL Finder ***[Web Crawler, Python, Go]*** Project *Apr 2023*

Download the web page available at the input URL and extract the URLs of other distinct pages linked to from the HTML source code.
- · Data Structure: Lists, Sets; Computer Networking: HTTP request, like get; Synchronous File IO

The below two are Open-Source Utility Tools @ Huawei Internship

Removal Tools ***[C, C++, Linux, IO]*** Tool *Mar 2023*
- · Introducing independent full automation tools in the project, reducing error rate to nearly 0%.
- · Integration of search, view and delete using Linux System Call ack, vim and sed.
- · In addition, there are others Linux system calls integrated, like clear screen.
- · Handling Asynchronous operation, like deletion and IO. Following Linux Tool UI and branching design.

Parsing Trace File ***[Java, Trace, Parser, IO]*** Project *May 2023*
- · Parsing Trace File and generate a unique and sorted list.

Frontend, backend

Weather App ***[UI, Flutter, OOP, API]*** (Group Project) Project *April – May 2023*
- · Collaborating with team members on an App integrating weather forest with daily calendar events. I am responsible for:
- · Frontend: Beautiful design with well-decorated UI components, written in Flutter, with Object-oriented programming.
- · Backend: Integration of iCalendar API, asynchronous IO, Computer Networking: HTTP request, like get.

Personal Website and Blog ***[React, HTML, CSS]*** https://peterhuistyping.github.io *Aug 2022*
- · Built up from scratch using *HTML/ CSS* ·Deployed by *React* to enable high code reuse.

Game Dev

Priest-Beneath [***Unity, C#***] Project (Github) | Blog | *Play with web deployment:* More *Feb 2023*
- · Unity C# GAME Group Project (2023 Cambridge Game Jam)

Algorithmic Trading

Optiver Go 2023 [***C++, Python***] Mar 2023
- · Introduction to trading with buy side and sell side. Implement pair-wise trading strategies as an optimal solution.

Appendices B: Reference

Haoran Jie · 1st

Cambridge Computer Science Undergrad | Intern @ Huawei R&D | Spring Intern @ J.P. Morgan, BoFA, & Bp

May 5, 2023, Haoran worked with Peter on the same team

During our time working together, I found Peter to be a highly collaborative and supportive colleague who consistently demonstrated a willingness to share his knowledge and expertise with others. Peter's ability to problem-solve complex c/c++ development issues was invaluable, and his commitment to learning and staying up-to-date with the latest advancements in his field is truly impressive. His passion for ray-tracing is contagious, and I have learned so much from his knowledge sharing.

Source: LinkedIn