Mark Chen

+44 (0) 7419584455
hc1620@ic.ac.uk
github.com/hmarkc
linkedin.com/in/mark-hao-chen

SUMMARY

Dedicated and creative programmer with a background in IT. Currently, in the third year of my Computer Science Bachelor degree, I took a wide range of Computing courses and have been on the Dean's List every year. Keen to utilise my skills in coding to create practical software with a heavy emphasis on great user experience. Proficient in Python, Java, and C.

EDUCATION

Imperial College London (GPA: 85.00%)
MEng in Computing *Oct 2020 – June 2024*

- Modules: Database, Computer Architecture, Computer System, Operating System, Algorithm Design and Analysis, Compiler, Network and Communication, Linear Algebra, Probability and Stats
- Publication: Hongxiang, F. & Mark, C. (2022). AutoBayes: Automating FPGA-based Acceleration of Bayesian Neural Networks. Manuscript submitted for publication.

PROGRAMMING EXPERIENCE

Huawei Technologies Research & Development
Graphics Modelling Intern, UK *March 2022 – Sep 2022*

- Built an application using Jinja template engine to deserialize specification in xml and json format to C++ structures, functions, and definitions as a part of the graphics api
- Completed a profile generator to produce valid graphics api profiles from given schema in json format using Python
- Wrote Python scripts to convert between xml and json files used for the API specification
- Used Flatbuffers to drive glTF sample generation efficiently

Fast Uncertainty Estimation using Bayesian Neural Network
Imperial College London *July 2022 – Sep 2022*

- Developed an automatic tool to transform benchmark CNN to Bayesian CNN using Monte-Carlo dropout, also known as Deep Ensembles, for both PyTorch and Keras framework
- Extended the tool to generate Bayesian hardware design based on High Level Synthesis for FPGA; used Xilinx Vivado for synthesis and implementation
- Tested the performance of the tool with ResNet18, VGG11, and LeNet5; contributed to a research paper as a co-author

Ampere Computing Shanghai, China
Java Software Developer *June 2021 – Sep 2021*

- Developed open-source plugins for Jenkins, a leading CI/CD platform, using JAVA/JELLY
- Became the maintainer of Lucene Search Plugin, an open search tool plugin; fixed Out Of Memory Exception of Lucene Search Plugin when handling over 100 GB of data
- Improved the indexing speed of Lucene Search Plugin by more than 50% after structure optimization; enriched the searching option and added pagination
- Published Build-Executor-Filter-Offline Plugin which adds filter function to Jenkins default executors panel
- Wrote groovy script to run pipeline jobs in Jenkins on all slave nodes and print their OS properties in html
- Automated memory usage tracking and periodic system cache clearing using bash scripts

WACC Compiler Project
Imperial College London *Jan 2022 – Mar 2022*

- Built a compiler to translate WACC programming language to ARM11 assembly code with 3 group members; WACC is a programming language that features variable and function declaration, conditional branching, looping, array and basic IO
- Used Parsley, an efficient Parser Combinator library written in Scala, for the syntactic analysis of WACC and wrote the semantic analysis of the expressions; designed an efficient flattened symbol table using prefix attachment
- Designed the internal representation of ARM instructions; wrote the stack allocation algorithm to implement a stack machine and the generation code for functions, statements, and expressions
- Extended the WACC compiler with type inference, Class, module import, generic types for functions, and pointer type
- Followed Test-Driven Development throughout the project by leveraging on GitLab CICD features

NoteyWiki WebApp
Imperial College London *May 2022 – July 2022*

- Conducted systematic user survey by interviews and questionnaire and identified the problem of lack of peer support for college students during exam revision
- Wrote an end-to-end web application using swift for the backend, html and javascript for the frontend; Used stencil as the template language to accelerate the frontend development process
- Set up PostgreSQL as the database and connected it to the heroku development process
- Used Stack css library together with javascript code to implement a rich text editor for users to upload multimedia content on the website
- Employed Kitura framework to handle URL routing; Used OpenCombine framework to serve requests to the database in a functional way
- Followed Human-Centred Design principles and Agile development throughout the project; user feedback are collected and reviewed constantly in development sprints to pivot the project

Pintos OS Project
Imperial College London *Oct 2021 – Present*
- Wrote a thread-safe scheduler that schedules the next thread to run based on the priority in a microkernel OS
- Built a priority donation algorithm in the lock and thread structure to avoid priority inversion probelm
- Wrote the logic for loading on demand by handling the corresponding page fault correctly
- Implemented Virtual Memory by implementing the second-chance frame-eviction algorithm and supplementary page table stored in thread structure; customized the page table to keep track of Swap space usage
- Completed memory sharing between read-only content by introducing a new list structure for the frame table

Arm C Project
Imperial College London *May 2021 – June 2021*
- Led a group of four to complete the project in C
- Completed an ARM emulator, i.e. a program that simulates the execution of an ARM binary file on a Raspberry Pi
- Implemented an ARM assembler which parses assembly and assembles it to binary files
- Wrote a compiler that compiles "Tiny C", a self-defined small subset of C language, into assembly

Arduino Air Quality Sensor Project
Singapore University of Technology and Design *2018 May – 2018 Aug*
- Led a team of four to make a multifunctional air quality sensor; wrote the code for Arduino sensors
- Designed and made suitable connecting wire and support; participated in Maker Faire Singapore 2018

OTHER WORK EXPERIENCE

Imperial College London London, UK
Undergraduate Teaching Assistant *Oct 2021 – Present*
- Helped first-year undergraduates with their weekly programming tutorials in lab sessions; mainly helped with three programming languages: Haskell, Kotlin, and Java
- Answered questions posted by first-year undergraduates on EdStem regarding the programming course

A*STAR Singapore
Research Intern *May 2018 – Jan 2019*
- Worked independently on a project of low-grade heat energy conversion; achieved better efficiency with Silicone Oil-Filled membranes
- Wrote a thesis with experiment and literature support under the supervision of Dr. Chen Xinwei

SKILLS

- **Programming:** C, Java, Swift, Python, Scala, Haskell, Bash
- **Tools:** GCC, Jenkins, Github, Docker, Heroku, AWS
- **Framework:** PyTorch, Keras, Kitura, Lucene, Jinja2
- **Language:** English, Chinese, Japanese

AWARDS

- **Dean's List(Year 1)**, Imperial College London, Aug 2022
- **Dean's List(Year 2)**, Imperial College London, Aug 2021
- **G-Research Ltd Prize**, G-Research Ltd, Aug 2021
- **Singapore SM1 Scholarship**, Ministry of Education Singapore, June 2015 – Dec 2019