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Summary

Accomplished Full-stack Software Engineer with a First-Class Honours BSc in Computer Science from King's College London. Professional internship experience at Amazon Web Services (AWS), Prime Video Studios, and Snapchat, developing complex, scalable applications including cloud-based microservices, real-time systems, and machine learning systems. Proficient in Python, C++, Java, and JavaScript, with a strong foundation in data structures & algorithms and systems programming.

Skills

Languages	Python, C++20, C, Java, JavaScript, Scala, Go, L ^A T _E X, Bash
Database	MySQL, PostgreSQL, MongoDB, Elasticsearch
Web	React, Node.js, Express, TypeScript, Django, HTML, CSS
Tools	Git, Docker, k8s, Make, CMake, perf, gdb/lldb, gRPC, OpenSSL
Systems	AWS, TCP/IP, TensorFlow, PyTorch, GNU/Linux

Experience

PLSV Group, University of Cambridge 2023-23

Research Intern

- Collaborated on the DIADEM project supported by EPSRC, Arm and Pernosco to improve LLVM compiler-generated debugging metadata coverage.
- **Informed future research** efforts by showing that the CPU bottleneck in metadata generation is the reflection library, not OS-level congestion or the registers itself.

Amazon Web Services (AWS) 2022-22

SDE Intern - AWS ML

- Designed and implemented optimized ML framework to cluster Cloudformation graphs and worked on new capabilities as microservices for the team's flagship conversational AI agent.
- Built Python-based dashboard app that accelerated PM screening and instantly visualized product's unique engineering pipeline and development workflow and reduced experiment time **10x**.
- Improved CI/CD infra, increasing successful deployments to the global fleet of **9M servers**.
- Participated in oncall, handled customer tickets, investigated & fixed critical software defects.

Department of Informatics, King's College London 2021-22

Teaching Associate: C++ programming (2021) and Operating Systems (2022)

- Head TA for the Operating Systems (2022) module: tutored students in OS development, C/C++ programming and Unix.
- Cut xv6 (educational) OS image build time **2x** with a CI pipeline using Packer and QEMU.

Prime Video & Amazon Studios 2021-21

SDE Intern - PV VQA

- Created a livestream player with real-time notifications of A/V defects detected using computer vision models trained on synthetic media, replacing third-party legacy software and **cutting overhead**.
- Contributed to AWS Elemental Media Distribution Services: MediaConnect, MediaStore, Kinesis.
- Contributed to building a service emulator for evaluating microservice orchestration workflow (AWS Step Functions + S3) latency and resource cost at scale, increasing existing performance by **3x**.
- Investigated the performance accuracy and efficiency of pre-trained defect detector models against self-supervised models when fine-tuned on synthetic fine-grained audio/video.

Snapchat

2020-20

Software Engineer Intern - Mobile Messaging

- Worked on cross-platform mobile messaging across Android and iOS.
- Contributed to the C++ cross-language interface (Djinni) to the platform-specific code.
- Implemented key features, including a cache-aware memory management framework and the high-level synthesis (HLS) protocol of Djinni; will be **deployed on millions** of datacenter servers

Education

Department of Informatics, King's College London

2019-22

BSc Hons., Computer Science, *First-Class Honours*.

[Springer Nature Prize](#) (distinguished performance in second year studies.)

DPS International School Singapore

2016-18

Highest score in academic year: A Level (A* A* A* A*) and AS Level (AAAA). Gold Scholar Badge and Excellence Scholarship (S\$6500).

Projects

libdeep

2024

- Wrote automatic differentiation tools for various implemented functions. Support parameterized layers and loss functions.
- Implement GPU/CPU-aware NArray library achieving comparable performance to numpy (2-3x slower).

LightDB

2023-24

- Implements key components of a traditional RDBMS including Buffer Pool Manager (for memory management), Hash Index (storage engine), Query Executors & Query Optimizer (operators & optimizer), and Concurrency Control.

Netstack(xx)

2023-24

- Implement TCP protocol: assembler, receiver, sender; network interface following ARP (address resolution protocol) and IP routing in C++.

Common Architectures

2022

- In collaboration with Amazon DevOpsGuru team in London and Germany.

liballocs-gc

2022

- In collaboration with my undergraduate supervisor Dr Stephen Kell.
- [Code](#), [paper](#), and [liballocs documentation](#).

Fun-compiler

2021-22

- Built an LLVM-backed FUN language compiler in Scala which uses a CPS (continuous passing style) format-compliant intermediate K-language.

Referees

[Dr Stephen Kell](#), Lecturer in Computer Science, King's College London

[Prof. Laurence Tratt](#), Professor of Software Development, King's College London

[Oswaldo Hernandez](#), Software Development Manager, Amazon Web Services