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I am looking for a 2024 summer internship in a field related to computer science.

Projects

Capture the Flag Challenges

In 2020, I participated in GCHQ's 'Cyber Discovery' course. I solved several CTF challenges throughout the year in the fields of binary exploitation, web security, programming, and forensics. The score I accumulated in the CTFs granted me access to the exclusive 'SANS Foundations' course, designed to train cybersecurity professionals. I passed the final invigilated exam with 96% and was one of only 500 students to be admitted into the final 'Elite' stage, where we spoke to industry experts and competed in a 2-day CTF. Since then, I have enjoyed solving 'Over the Wire' CTF problems and have joined the University of Cambridge Competitive Programming Society (UCCPS) and Cyber Security Society (CyberSoc).

Local Business Penetration Testing

To put the skills I learned in the 'Cyber Discovery' course to use, I contacted a local company to offer my website penetration testing service. After getting written permission from a local renting business, I identified security vulnerabilities in their production website, including cross-site scripting and blind SQL injection. My "clear and concise" feedback was used to resolve the security issues, and my recommendations for reducing future risk were implemented.

Food Bank App

I built an Android and iOS app for my local food bank. Staff can log in to a PHP server to update which products are in low stock, and patrons can view which items are most needed. As a result, donations better align with the needs of individuals and families.

x86 Assembly Pong

To better understand binary exploitation and low-level programming, I learned x86 Assembly and wrote pong. Linux device files are used for graphics and keyboard input.

8-Bit Computer

I built an 8-bit computer using a 6502 microprocessor. It has 32KiB of ROM and an output interface register connected to an LCD character display. To reduce cost, I made logic gates from transistors, used multiple clock signals to overcome hardware limitations, and built my own ROM programmer.

AWS Website

I host and maintain my personal website, chris256.com, using NGINX on a Debian AWS Lightsail machine.

Chess Engine

I wrote a chess engine in Rust for my first EPQ. Learning the Rust borrowing checker changed my perspective on pointer ownership and greatly improved the quality of my C/C++ code.

Compiling a Linux System from Scratch

For my second EPQ, I wrote a guide on how to build a Linux-based OS from scratch for Raspberry Pi hardware. The shell, toolchain, coreutils, and all other software are compiled from the source. I currently use Void Linux as my everyday operating system.

3D Renderer

I'm always adding and changing features of my experimental 3D renderer. Designing abstractions that can accommodate this regular change has been by far the most difficult part of the project. To solve this, I explored a range of paradigms before finally settling on my own interpretation of data-driven design.

Philosophy

I am interested in the relationship between computers and human consciousness. Our current understanding of physics suggests the physical processes in the brain are computable. If true, this means our consciousness is simply the invocation of some (immeasurably complex) algorithm. This, in turn, implies a sort of dualism. A 'consciousness algorithm' would be an abstract mathematical idea that exists independently from any physical matter.

Education

I am currently studying computer science at the University of Cambridge.

Qualification	Grade	Exam Board
Computer Science*	A*	AQA
Mathematics	A*	Edexcel
Further Mathematics	A*	Edexcel
Computer Science EPQ (2021)	A	AQA
Computer Science EPQ (2023)	A*	AQA

* My computer science A-Level score was in the country's top 50.