

## Experience

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### 2024-05 **Software Engineer** BG Automotive

Present

- Implemented stateless, secure authentication using JWTs stored in HTTP-only cookies, with access and refresh token rotation for session management.
- Implemented HTTP middleware in Rust using Redis as an intermediary cache layer, Server-Sent Events, and frontend Virtualization/Windowing to handle payloads 600 times larger.
- Developed a silent background process that monitors key presses and recognizes barcode syntax, triggering image capture from the warehouse CCTV system.
- Applied systems programming concepts, including mutex-based synchronization, to prevent race conditions and manage concurrent write operations.
- Used `cron`, the GNU `coreutils`, and `git` to create an automated deployment pipeline for various automated services.
- Deployed 10 containerized cloud applications optimized for resource efficiency, achieving reliable operation on a single low-tier cloud instance.
- Interfaced with the `xlsxwriter` C library to programmatically generate non-trivial excel spreadsheets, such as spawning charts and extracting/including VBA macros at compile time.

### 2024-03 **Volunteer Data Assistant** Bath Royal Literary and Scientific Institution

2024-05

- Used text-manipulation tools from the GNU `coreutils` such as `awk` and `sed` to process and clean existing tabular data.

## Projects

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### Structure-Preserving Encryption and Decryption [johanyim/spead](https://github.com/johanyim/spead)

- Implemented key derivation with Argon2 algorithm to derive cryptographically strong keys to mitigate brute-force and GPU-based attacks.
- Applied Format-Preserving Encryption (FPE) to encrypt and decrypt structured data without altering data formats or types, reducing the effect of encryption on data type validation.
- Combined concepts from JSON traversal/pointers (RFC 6901) with nonce selection to produce deterministic encryption, while resisting ciphertext-equality attacks.

## Education

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### 2019-09 **Computer Science MComp (Hons)** University of Bath

2023-05

Degree Class awarded: 2:1 - Functional Programming (82%) - Machine Learning (77%) - Statistics for Data Science (73%) - Cryptography (78%) - Data Structures and Algorithms (82%) - Computer Systems Architecture (82%)

### 2017-09 **International Baccalaureate (iB)** King George V School

2019-05

39 points overall - HL Maths (7) - HL Physics (7) - HL Computing (5)