






# Johan Yim

## Software Engineer

### Experience

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

- Streamlined user experience by implementing stateless, secure authentication using JWTs stored in HTTP-only cookies, with access and refresh token rotation for session management.
- Used Redis Pub-Sub and gRPC to synchronize distributed systems in real time, bridging the communication between our data repository and application layer.
- Implemented HTTP middleware in Rust using Redis as an intermediary write-back cache layer, Server-Sent Events, and client-side Virtualization/Windowing to handle payloads 600 times larger.
- Implemented semaphore-based synchronization in an asynchronous, multi-user environment, to prevent race conditions and manage concurrent write operations.
- Developed a daemon process that monitors key presses and recognizes barcode syntax, triggering image capture from the warehouse CCTV system to be used as customer-facing proof of order integrity, saving over £100,000 worth of reimbursements.
- Developed, deployed and maintained 10 containerized cloud applications optimized for resource efficiency, achieving reliable simultaneous operation on a single-core, low-tier cloud instance consuming less than 2 GB of memory running in parallel.
- Used cron, the GNU coreutils, and git to create an automated deployment pipeline for various automated services.
- Migrated from and interoperated with legacy C# interfaces from 2003 to modern Rust-based desktop applications, web APIs and scheduled automations.
- Implemented procedural compile-time macros to enhance developer experience through abstraction, reducing the source lines of code in the overall project by 42%.
- Interfaced with the `xlswriter` C library to programmatically generate non-trivial excel spreadsheets, such as spawning charts and extracting/including VBA macros at compile time.

#### 2024-03 2024-05 **Volunteer Data Assistant Bath Royal Literary and Scientific Institution**

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

### Projects

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

- Used the `perf` utility to inspect call graphs, identifying and reducing the impact of performance bottlenecks.
- Compiled Rust to WebAssembly (WASM) to execute performance-critical logic on the client-side, reducing pressure on backend services while delivering a responsive user experience.
- Implemented key derivation with the 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.
- Built a fully automated, lightweight AWS deployment pipeline from scratch using custom git hooks and rudimentary Linux utilities such as `rsync`, `openssl`, and the GNU coreutils.
- Configured `nginx` as a reverse proxy to distribute requests to multiple services.

### Education

#### 2019-09 2023-05 **Computer Science MComp (Hons) University of Bath**

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 2019-05 **International Baccalaureate (iB) King George V School**

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