

## Summary

*Product engineer and open-source contributor with expertise in web technologies.*

I have been programming since I was sixteen, originally learning C so I could create computer games for the handheld open-source device, the GP32. Since then I've worked with a wide range of programming languages and technologies, specialising in web technologies—such as Node.js and React, where I have 12 and 9 years of experience respectively—while also gaining both commercial and hobbyist experience with Python and Rust.

**Interests:** end-to-end architecture and implementation; 12 factor back-ends; strongly-typed data; low-latency UIs; tooling; large language models (LLMs); working in public; writing cultures; vertical integration; defactoring; inlining and colocation; decisions that circumvent issues.

**Languages:** TypeScript/JavaScript, Python, Rust, SQL, Shell/Bash, HTML, CSS, RegEx, Swift, Kotlin.

**Tools:** Kubernetes, AWS, S3, RabbitMQ, Terraform, Docker, Linux, Git, Graphviz, PostgreSQL, MySQL, MongoDB, SQLite, Redis, Neo4j, Cassandra, Elasticsearch, Electron, OpenFin, Figma/Sketch.

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## Accomplishments

- **Increased the development velocity of a complex, low-latency trading application with a strict deadline:** Initiated process improvements and developed tooling, libraries and practices, that enabled multiple teams to work in a highly scalable manner efficiently producing over 200 packages.
  - **Organised AngelHack London 2014:** Coordinated and led a significant international hackathon event that provided a smooth experience for approximately 100 participants.
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## Experience

Freelancer, Consultant & Contractor

### Private Study

*Apr 2023 –*

- Articles exploring algorithms, mathematics, and implementing a neural network in Rust.

### Software Engineer at T. Rowe Price

*Oct 2020 – Mar 2023*

- Presented a library to over 100 technology workers at a show-and-tell, wrote logic that was used by multiple teams, and prepared a new technology for wider company usage (i.e. the "Invest" designation).
- Working within the Fixed Income Attribution team, I performed a full rewrite of their React application migrating it to TypeScript while also replacing Redux, doubling the Lighthouse score from 50 to 98, and significantly improving the testability of grids and tables.
- Enhanced reliability of data pipeline services built with Python, Kotlin, Node, S3, and PostgreSQL. Fixed major bugs in group-wide shared libraries for logging, tracing and scheduling.
- Engineered Playwright-based synthetic monitoring infrastructure to continuously run E2E tests against different environments and log and expose structured reports, screenshots, traces and videos.

### Software Architect at JPMorgan Chase & Co.

*Aug 2019 – Oct 2020*

- Re-engaged in a Software Architect role within the newly-formed Core Engineering team in the Corporate Investment Bank (CIB) business, recognizing the considerable value and expertise I brought during my previous tenure.
- Played a key role in setting strategy and defining the technical vision for the firm's UI platform, exerting significant influence over the platform's architectural direction.
- Participated in a high-caliber team of engineers, fostering a technically rigorous and innovative environment, that provided UI Infrastructure, libraries and tooling for high-scale development as well as expert consultancy across the organisation.
- Engineered the transition of multiple properties into a blend of microfrontends and monorepos, with the aim of creating more integrated and cohesive applications. This strategic move not only improved collaboration between different application teams but also established a 'Golden Path'—a set of best practices and tools to elevate the baseline quality level across an organisation. To support these changes, I spearheaded the development of bespoke infrastructure and tooling, including caching infrastructure for CI and distributed Argo workflows with Kubernetes, which were demonstrated as reducing E2E testing times from hours to minutes.
- Provided stewardship of multiple applications and their foundational components, implementing additivity and deprecation strategies to safely roll out new major versions with breaking changes. For instance, I contributed to the upgrade of a large 50+ component library from v3 of Material UI to v4. To handle these large, complex upgrades effectively, I leveraged my deep expertise in monorepos, codemods, visual regressions, type-checking and automation.

## Technical Lead at Shell

Dec 2018 – Jun 2019

- Entrusted with the responsibility of transitioning an important data project in-house, requiring extensive communication with technical and non-technical colleagues based in Houston, Chennai and London, and acting as the primary technical liaison with senior leadership.
- Oversaw the hiring and onboarding of a team of data scientists and data engineers, fostering a highly collaborative work environment that incorporated weekly discussions and training workshops to instill a strong foundation for the future.
- Identified areas in the earlier consultancies work that needed improvement and established better practices around quality and communication, while also prioritising and overseeing the rapid build of a data platform using tools such as Azure, Docker, Helm, Jupyter, Kubernetes, Python and Spark, which included reviewing code, directing changes, and occasionally contributing to coding. These efforts resulted in a four-fold increase in the end-to-end pipeline's speed.

## Application Engineer at JPMorgan Chase & Co.

Jun 2017 – Dec 2018

- Worked within the Core Engineering team and was instrumental in transitioning 'Execute', J.P. Morgan's FX, Commodities and Rates Single Dealer Platform from a legacy Flash-based system facing its impending end-of-life in 2020 to a modern web application written using TypeScript, React, Redux, RxJS, Protobuf and Emotion. Many of the practices I introduced were subsequently adopted by technology teams across J.P. Morgan.
- Established the project's governance, creating the RFC process and drafting several RFCs on topics like entitlements and module loading, performance profiling and continuous deployment.
- Engineered a bespoke toolchain/framework that enhanced development velocity and scalability. Leveraged considerable open-source experience to create monorepo environments that produced best-in-class ESM/CommonJS/types packages using Rollup, Babel and TypeScript. This bolstered modularity and allowed multiple independent teams to collaborate on over 200 re-usable packages.
- Contributed to almost all of the core modules but particularly the shell, the widget tiling system and the messaging/subscriptions/data layer. As one of the more experienced members on the team, I spent a substantial amount of time mentoring developers from different backgrounds in best practices, organising architecture meetings and conducting code reviews across the whole project to coordinate work and ensure that our guiding principles were followed. I also developed a Danger plugin that allowed rapid feedback on real work by automatically deploying applications/storybooks and linking these to PRs so reviewers could see and interact with changes.

## Consultant at YLD

Jan 2017 – Apr 2017

- Worked alongside the client's CTO to improve the logging, tracing and error handling functions of an in-house Kubernetes-based microservices framework.
- Implemented 4 Node.js microservices while also supporting the team by developing shared helpers to mock data during test execution and writing documentation on how to migrate an SQLite database to MySQL.

## External Advisor at McKinsey & Company

Apr 2016 – Dec 2016

- Counseled enterprise clients on software architecture, provided mentoring and conducted rigorous code reviews.
- Created a set of sophisticated data analysis tools with state-of-the-art visualisations built using D3.
- Engineered software to optimize energy and material usage within factories. This also involved implementing algorithms for calculating costs and analysing flows of energy, product, and waste through the system.

## Previous Client Work

Apr 2013 – Apr 2016

- Led the re-platforming of a legacy monolithic passport system at the Home Office into a secure, efficient, and scalable Node.js microservices-based solution on a private cloud, incorporating secure data segregation, idempotent APIs, and custom LDAP authentication. Managed a small dedicated team throughout this process. Furthermore, I effectively communicated the architectural choices of a new platform to the entire department during a show-and-tell presentation.
- Development of a real-time animated map of driver locations for Hailo, an [open-source analytics middleware for the Sequoia-backed startup Keen.IO](#), and a React website and component library for the Economist.

## We R Interactive

### Lead Game Developer

Oct 2012 – Apr 2013

- Delivered MVP of an innovative second-screen social game utilising Node.JS, WebSockets, Redis and Cassandra.

## Saffron Digital

### Lead Python Developer

Oct 2010 – Oct 2012

- Founding back-end engineer on the HTC Watch project, leading development until HTC's acquisition for \$48m.
- Developed expertise in DRM, parallel video encoding, and payment services using Python, MySQL and AWS.
- Developed an application for a Samsung Connected TV device with challenging hardware limitations.

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## Education

### Coursera

#### Machine Learning

Feb 2016

Course Certificate, License E3XLGER56CQ3

### University of Kent

#### Bachelor's degree in Computer Science

2005 – 2009