# Michael Walker

## *Experience*

### GoCardless

**Senior Software Development Engineer** Apr 2024–now

**Software Development Engineer** Mar 2022–Apr 2024

- Designed a replacement scheduler for kubernetes cronjobs to gracefully handle daylight savings and other timezone changes.
- Led a project to localise our daily batch-processing pipelines to optimise timings with international banking partners.
- Implemented an MVP of using machine learning to speed up payment processing where there is low risk of failure, and joined customer calls to discuss their needs.
- Analysed and improved the performance of time-sensitive data processing pipelines through table partitioning and algorithmic improvements.
- Led implementation of a new event sourcing approach to our core payment processing logic.
- Led sessions for team members to discuss potential incidents and identify mitigations.
- Mentored junior developers.

### Government Digital Service

**Senior Developer** Jun 2019–Feb 2022

- Tech lead on a small multidisciplinary agile team doing discovery work into GOV.UK Accounts and Personalisation, where I:
  - Worked with product and delivery managers to prioritise and delegate work.
  - Implemented authentication and authorisation with OAuth / OpenID Connect.
  - Established good practices like continuous deployment and service level objectives.
  - Proposed and built consensus for large changes to the GOV.UK stack.
  - Worked with architects and our CDN provider to plan how to transition GOV.UK from a mostly static and very cacheable website to being much more dynamic.
- Prototyped and then productionised a machine learning pipeline for search result ranking using Amazon SageMaker.
- Lead an upgrade from Elasticsearch 5 to Elasticsearch 6.
- Worked with external pentesters, assisting their work and triaging issues.
- Worked with performance analysts to plan and implement A/B tests.

**Developer** Apr 2018–Jun 2019

- Made various improvements to the GOV.UK stack: for performance, technical debt, and architecture debt. Mostly Ruby and Rails or Sinatra, some Python, various types of database (e.g. PostgreSQL and MySQL). All running on Linux.
- Lead initial experiments into load testing.
- Planned and implemented an upgrade from Elasticsearch 2 to Elasticsearch 5.
- Worked with AWS infrastructure using Terraform and Puppet.
- Gave regular support to teams which did not merit a full-time developer.

### Overleaf

**Software Engineer (Part Time)** Jan–Mar 2018

- Maintained legacy Rails and Java / JGit services during the merger with ShareLaTeX.

**Software Engineering Intern** Jul–Sep 2017

- Fixed security issues, ranging from CSRF and XSS vulnerabilities to a bug in Heroku's router.
- Ported a large Rails 4 application to Rails 5.
- Designed and implemented a distributed message bus using Node and Redis.

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### Pusher

**Software Engineering Intern** May–Aug 2016

- Contributed to the productionisation of a prototype low-latency distributed message bus using Go and Raft consensus.

### CoreFiling

**Software Engineering Intern** Jul–Sep 2014

- Refactored a Java in-house wiki program, fixing numerous long-standing bugs.

## *Education*

### University of York

**Ph.D in Computer Science** 2014–2019

My thesis "Revealing Behaviours of Concurrent Functional Programs by Systematic Testing" examined the deterministic testing of concurrent programs with shared memory and message passing. Supervised by Colin Runciman, and examined by Simon Peyton Jones and Ana Cavalcanti.

**M.Eng in Computer Systems and Software Engineering** 2010–2014

My dissertation on the formal verification of stop-the-world garbage collectors received first-class honours. Overall, I achieved a 2:1.

## *Publications*

**Revealing Behaviours of Concurrent Functional Programs by Systematic Testing**
Ph.D thesis. University of York, 2018.

**Cheap Remarks about Concurrent Programs**
Michael Walker and Colin Runciman, 2018. In *ACM SIGPLAN Symposium on Functional and Logic Programming*.
**doi:** 10.1007/978-3-319-90686-7_17

**Déjà Fu: A Concurrency Testing Library for Haskell**
Michael Walker and Colin Runciman, 2015. In *ACM SIGPLAN Symposium on Haskell*.
**doi:** 10.1145/2887747.2804306

*PDFs and BibTeX entries are available on my website.*

## *Open Source*

**Déjà Fu** 2015–now

A library for testing concurrent Haskell programs, developed as part of my Ph.D thesis. It has had some commercial users.
**github:** barrucadu/dejafu

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