

Ross Kelso

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Software developer with 5 years' experience in full-stack development and a first class MSci in Computer Science from St Andrews.

Specialized in rapid development of data analysis and visualisation systems using `c#`, `python`, and `javascript`, with a background in machine learning, computer vision, and industrial software.

Technical Skills

Languages & Frameworks: `c#`, `python`, `javascript`, `typescript`, `.net`, `angular`, `react`, `sql`, `rust`

Technologies: `elasticsearch`, `git`, `azure`, `aws`, `docker`, `kubernetes`, `tensorflow`, `nodejs`, `windows`, `linux`, `ci/cd`

Concepts: Machine Learning, Data Engineering, Cloud Architecture, Computer Vision

Work Experience

Cintra HR & Payroll - Software Developer (since June 2025)

Creating HR & payroll management software.

`c#` `typescript` `angular` `ci/cd` `aws` `docker` `terraform` `python` `mcp`

- Delivered new cloud-based pensions UI with Angular and .NET ahead of schedule, focusing on UX improvements, validation logic, and data integrity when integrating with legacy database tables.
- Identified and fixed critical validation middleware bug where premature type conversion caused required field and date validation to silently fail. Modified application-wide middleware to validate against loosely-typed request bodies, preventing entire classes of validation errors.
- Designed and implemented load testing strategy using k6, then diagnosed and resolved database deadlocks caused by inefficient triggers. Refactored triggers by unrolling dynamic SQL and adding strategic indices, achieving 5x throughput improvement.
- Work full-stack with emphasis on backend development in a cross-functional team of 4 developers, 1 PM, and 2 designers.
- Developed a Model Context Protocol (MCP) server enabling AI coding assistants to search and retrieve relevant code across full-stack codebases and understand complex database relationships and constraints, improving context accuracy for LLM-assisted development.

Intelligent Plant - Software Developer (2021-2025), Intern (University Holidays 2017-2021)

Creating data storage, analysis and visualisation solutions for the energy industry.

Lead developer for the [Industrial App Store API Python Client](#) `python` `pandas` `django` `tensorflow`

- Designed and implemented a Python SDK to simplify OAuth authentication and data access for the Industrial App Store API, automatically converting API responses to pandas DataFrames for data science workflows.
- Set up and maintained JupyterHub instance in Kubernetes for internal and client data science work.
- Created demonstration notebooks showing time series prediction with TensorFlow, used by industrial clients

and university research partners.

Lead developer for [Sequence of Events Explorer](#) `c#` `javascript` `html` `css` `elasticsearch` `ci` `azure`

- Built application from MVP to production as sole developer, becoming the company's 3rd largest product and sold to every client with alarm analysis capabilities.
- Designed intuitive drag-and-drop query interface allowing users to build complex filters for industrial alarm event logs, dramatically reducing noise in sequence-of-events analysis.
- Mentored junior developers through code reviews and maintained code quality standards as project technical lead.
- Developed custom domain-specific query language with parser to translate user queries into Elasticsearch queries.
- Architected frontend using clear MVC pattern with state-driven DOM updates, minimizing state synchronization issues and contributing to application stability.

Developer for [Alarm Analysis](#) and Intelligent Plant Historian `c#` `elasticsearch` `machine learning`

- Created novel Hidden Markov Model approach to parse non-standard semi-structured alarm data from industrial sources with inconsistent formats (interleaved JSON, CSV, and fixed-width tables).
- Built interactive web interface allowing domain experts to iteratively refine the model's field boundary detection and labelling.
- Upgraded Elasticsearch from version 2 to 7, doubling query throughput at 1-second latency and achieving 10x improvement at 5-second latency through index optimization and breaking change migrations.
- Worked directly with clients for on-site installations and support.
- Developed and maintained a backend for performing complex data aggregations.

Developer for [Gestalt \(PnID & Trend\)](#) `c#` `sql` `javascript` `azure`

- Led architectural separation of monolithic API into distinct application and data components, enabling independent deployment cycles and reducing downtime.
- Replaced file system storage with SQL database implementing hierarchical folder structure through relational model, enabling Azure App Service deployment with blue-green deployment strategy.

Experimental projects involving the application of AI and large language models to our software `python` `docker` `tensorflow` `ollama`

- Deployed internal AI inference APIs for proposal writing and proof-of-concept industrial automation applications.
- Developed locally-hosted coding assistants to maintain IP security while exploring LLM integration opportunities.

Lead developer for [Power BI Industrial Connector](#) `c#` `power query m` `react` `yarp` `azure`

- Replaced custom endpoint controllers with YARP proxy implementing licensing middleware.
- Maintained 100% backwards compatibility while fixing incorrectly named legacy functions.
- Re-architected connector removing reverse proxy data transformation dependency, enabling direct connection to on-premises installations and simplifying NTLM authentication.

Optimized the [Excel Data Query Add-in](#), reducing query time from minutes to seconds. `c#` `excel-dna`

- Implemented async request processing to prevent UI blocking during data queries.

- Designed intelligent request batching system bundling compatible queries reducing hundreds of individual requests to single batched calls.
- Reduced typical query completion from 30+ seconds to near-instantaneous with responsive UI.

Education

University of St Andrews - Computer Science MSci First Class (2016-2021)

Deans' List, for academic excellence 2017/18, 2018/19, 2019/20

Masters Thesis

[Synthetic GPS Traces for Privacy Protection](#) `python` `tensorflow` `pandas` `numpy`

- Applied Markov Models and Convolutional Generative Adversarial Networks to synthesize realistic GPS movement data indistinguishable from real traces while preserving statistical properties like speed and path-following behavior.
- Evaluated model accuracy and effectiveness in preserving statistical properties of real-world movement data.

Senior Honours Project

[Computer Vision in Cue Sports](#) `opencv` `python`

- Designed computer vision system for unconstrained pool table analysis, handling arbitrary camera angles and partial occlusion without the need for calibration markers.
- Implemented perspective transformation and object detection achieving millimeter-scale ball position accuracy,
- Developed snooker detection algorithm and generated 3D table models enabling arbitrary viewpoint rendering.

Junior Honours Project

Group software engineering project to create an encrypted wireless network of embedded devices `c` `nodejs` `python` `git`

- Led protocol design team coordinating inter-group standards for encrypted mesh network communication on Micro:bit devices.
- Implemented RSA encryption from scratch in C, Python, and JavaScript to enable secure interoperability across devices, gateways, and web services.

Side Projects

Game Design `rust` `bevy` `godot`

Competed in the [GMTK Game Jam 2025](#) using `godot` .

Implemented a [Tetris clone](#) in `rust` using `SDL2` including a simple software synthesizer to play the classic music.

Implemented a [Flappy Bird clone](#) in `rust` using `bevy` game engine.