

Rachel Bowyer

Website: <https://www.bowyer.info>

Email: rachel@bowyer.info

Highly experienced Staff Engineer specializing in AI/ML systems, financial technology, and distributed architectures. Passionate about continuous learning and embracing technological change. Proven track record of leading technical transformations while mentoring teams and driving engineering excellence.

Skills

Programming: Python, Java, Clojure, C++, SQL, DBT, Pandas, Scikit-learn

Engineering Leadership: Technical design, Mentoring, Agile/Scrum, Engineering culture, Infosec

AI/ML: Large Language Models (LLMs), Retrieval-Augmented Generation (RAG), Neo4j, Chroma, Airflow

Cloud & DevOps: AWS, Docker, Kubernetes, Snowflake, Microservices, CI/CD, TeamCity, GitHub Actions

Architecture & Systems: Distributed systems design, Bi-temporal architectures, Data pipelines

Previse – Principal Engineer

Sept 2021 – Dec 2025

Previse use AI to accelerate invoice payments and perform spend analysis

Technologies: Clojure, Python, Pandas, TeamCity, GitHub, AWS, LLMs, Airflow, DBT, Docker, Kubernetes, Snowflake, MariaDB, Chroma, Neo4j, SonarQube, Microservices, Scrum

- As a Principal Engineer at a small start-up my role was wide-ranging across Engineering and Data Science, covering technical design, project implementation, architecture, mentoring, and hands-on contributions to our hardest technical challenges

Architecture and Engineering

- Worked with external consultants to define a medium-term target architecture for our microservices-based payments system
- Led the development and design of the project to refactor our ledger engine, introducing bi-temporal concepts to improve scalability whilst maintaining auditability
- Led the development and design our entity resolution system (which combines LLMs, error models and Neo4j) and took it from a research project to pre-production

Data Science

- Redesigned our UNSPSC line-item categorisation system, which makes use of RAG+LLM ensemble models. Zero-shot accuracy of classification at Class/Level 3 of line items in ERP data for a large Fortune 500 company increased from 51.5% to an industry-leading 83%
- Built an error model using logistic regression with stratified cross-validation and calibration for the UNSPSC categorisation system to predict when the LLMs have made an error and manual review is advised

Engineering Culture

- Encouraged a culture of fully automated CI/CD pipelines from GitHub to deployment of code, including automated tests, linting (via SonarQube), automated NVD and copyleft licence detection
- Facilitated collaboration between the technical teams – Engineering, Data Science, Data Analytics and DevOps – to develop and deliver new features and projects
- Advocated for, piloted and designed the rollout (with a focus on infosec) of AI coding assistants

Droit – Senior Software Engineer

Aug 2017 – Jan 2020

Droit builds systems to ensure compliance with financial regulation

Technologies: Clojure, ClojureScript, React/Reagent, Bootstrap, ANTLR, Postgres, AWS

Worked on two main projects: Parsing and Annotator

- Parsing was a project to automatically convert legal texts from simple XML or text (HTML, Word, PDF) into [Akoma Ntoso](#) (the de facto standard for legal XML markup)
- Designed and led an innovative approach combining a novel lexer (written in Clojure), the ANTLR parser and a framework (written in Clojure). The use of high-level languages/grammars and a framework minimised the effort required to convert legal texts in new jurisdictions
- Designed and led the development of a SPA to view and annotate Akoma Ntoso documents

Agents Mutual (www.onthemarket.com) – Senior Software Engineer**Jan 2016 – Aug 2017***Languages: Clojure, ClojureScript. Technologies: AWS, Redis, Postgres**Process: Scrum, Microservices, TDD, CI, Automated deployment to cloud*

- Key project: replacement of monolithic feed system, which only supported batch data, with a new microservices based system 'databus' that could handle batch and real-time data

MailOnline - Developer**May 2015 – Dec 2015***Worked on the front-end website www.dailymail.co.uk**Languages: Clojure, JavaScript. Technologies: CSS, ActiveMQ, Elasticsearch, Ring/Compojure*

- Led the development of a new feed to support Facebook's Instant Article platform – articles viewed from Facebook now render instantaneously

Goldman Sachs – Vice President (technical lead/systems builder)**Feb 2011 – May 2015***Technical aspects of my roles included design and code reviews plus hands-on development for reports*

- Managed a team (3 direct reports) to develop liquidity risk reports for both internal use and for external regulators
- Worked with business users (Corporate Treasury) to understand and clarify user requirements. Successfully provided status updates to key stakeholders in Corporate Treasury and Technology
- August - December 2013 worked in the Bangalore office. Trained the newly established team

Various companies – Developer/Senior Developer/Vice President**Pre 2009**

Over this period, I worked for 6 companies: KAI Computer Services, Renault Financial Services, NDS, Citigroup, Lehman Brothers and Writing Solutions. I was a Vice President at Citi and also at Lehman where I managed a team of 3 people.

Selected additional learning (Massive Open Online Courses and projects)

- **Nov 2025** Manning Live Project – “Sentiment Analysis and NLP for Marketing”
- **Oct 2021** Udacity Nanodegree – “Artificial Intelligence”
- **Apr 2021** Manning Live Project – “Semi-Supervised Deep Learning with GANs”
- **Dec 2020** MITx “6.431x Probability – The Science of Uncertain Data” (96%), “Fundamentals of Statistics” (98%) and “Machine Learning with Python - From Linear Models to Deep Learning”
- **Sept 2018** UCSD & Higher School of Economics “Data Structures and Algorithms” Specialization

Professional Qualifications

- **Dec 2023** Certified Scrum Advanced Developer
- **Dec 2019** Certified ScrumMaster
- **Oct 2011** Oracle Certified Master Java SE 6 Developer
- **Jul 2010** Sun Certified Programmer for Java SE 6 (Mark: 96%)

Publications and contributions

- Published author: Chapter 12, “Vectors” in “Clojure, The Essential Reference” (Manning, 2025)
- Open-source contributions including Keirin, a Clojure performance benchmarking library

Education**BPP Holborn, London**

- Postgraduate Diploma in Legal Practice (LPC). *Distinction (78% average)*

City University, London

- Graduate Diploma in Law (CPE). *Commendation*

University of Bristol

- B.Sc. Hons in Mathematics. *Class 2.1*. Science Faculty recognition for “Outstanding” first-year performance

Referees

Available on request.