Andy Challis

Senior Principal Engineer

Melbourne, AU

🔗 andrewchallis.co.uk   ✉ andrewchallis@hotmail.co.uk   📱 +61482043277

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Andy is a Senior Principal Engineer with expertise in architecting and deploying fullstack AI systems and cross-platform mobile solutions at scale. With a background in data science, fullstack development, and cloud infrastructure, he specializes in building and leading high-performance engineering teams. His experience spans building AI-driven applications, re-architecting enterprise systems with TypeScript, delivering offline-first mobile apps, and managing teams to drive successful business transformations.

SKILLS

Python
Master

PyTorch | TensorFlow | FastAPI | OpenCV | scikit-learn | Pandas | Flask | Dash | langchain

Full Stack
Master

TypeScript | Golang | NodeJS | React | React Native | Tanstack | KonvaJS | CSS | HTML5 | NextJS

DevOps
Master

AWS | GCP | Pulumi | Terraform | Docker🐳 | Kubernettes | Git | Github | GitLab | Bitbucket

Databases
Master

PostgreSQL | DynamoDB | MySql | Elastic | Hive | sqlite | Neo4j

WORK EXPERIENCE

Senior Principal Engineer at Slalom Build

May 2025 - Current

📍 **Melbourne, AU**

As Senior Principal Engineer at Slalom Build, I lead complex full-stack mobile and web projects, driving architectural transformations and managing high-performing engineering teams to deliver innovative solutions for startups and scale-ups.

- Led complex full-stack iOS, web, and Android projects for startups and scale-ups, delivering end-to-end mobile and web solutions.

- Re-architected enterprise systems from Java to full TypeScript stack, achieving code reusability across iOS, Android, and web platforms while consolidating developer requirements.

- Managed a team of 6 direct reports, providing technical leadership and mentorship across multiple concurrent projects.

- Successfully delivered an offline-first mobile application with robust synchronization capabilities, ensuring seamless user experience in low-connectivity environments.

- Drove technical strategy and architecture decisions for multiple client engagements, focusing on modern TypeScript-based solutions and cross-platform development.

Principal Engineer at Slalom Build

Oct 2021 - May 2025

📍 **Melbourne, AU**

At Slalom Build, I drive the convergence of AI engineering and full stack development. My role encompasses architecting scalable AI systems that integrate advanced ML models with end-to-end software solutions, ensuring transformative business impact through innovative technology and agile practices.

- Led enterprise AI projects, including a GraphRAG-based solution for RMIT that combined LLMs, knowledge graphs, and vector databases to enable accurate natural language querying.

- Architected and deployed scalable AI solutions with robust full stack development, leveraging technologies like Next.js, LangChain, and AWS ECS for real-time data processing.

- Developed a custom AST parsing tool and dependency mapping framework to estimate migration efforts for 50+ applications moving from on-premise systems to an AWS Redshift-based data platform.
- Provided thought leadership in both machine learning and full stack engineering, mentoring multidisciplinary teams of data scientists and software engineers.
- Collaborated with Product Owners to integrate agile methodologies with cutting-edge AI innovations and full stack architectures, driving successful business transformations.

Senior Manager at Capgemini Invent
Jan 2021 - Oct 2021
📍 **Melbourne, AU**
Capgemini Invent combines strategy, technology, data science and creative design to solve the most complex business and technology challenges.

- Solution Lead for a $5 million-dollar account, where we scaled up the project team from 7 to 35 members within 12 months
- Built and presented winning proposals for data science projects and overall data strategy to both new and existing clients - exceeding my annual sales target within the first 3 months
- Lead the Python community (over 200 people) for Capgemini in APAC and designed courses and structure to enable large scale training and certification - PyCap
- Architected SOTA (State of the Art) OCR, document classification, quality and extraction microservices which resulted in an estimated 100 FTE reduction ~ $10m YoY, greater clarity for the citizen and the project was awarded the ISG Paragon APAC award.
- Worked across multiple projects simultaneously with different roles, such as; delivery lead, solution lead and technical advisor

Manager at Capgemini Invent
Jun 2019 - Jan 2021
📍 **Melbourne, AU**

- Designed, built and deployed multiple open source deep learning systems into production with 99.9% availability
- Spearheaded the CapgeminiInventIDE open source project on GitHub, which has boosted our external visibility in the space massively, allowing applicants to see the level we are preforming at and the ability to contribute alongside us
- Designed and ran an 8-week beginner/intermediate Python course for the whole of Capgemini Australia. The course curriculum was built and designed by myself and incorporated any additional topics that participants wanted to cover.
- Primary interviewer for building high preferment teams, graded over 40 take home assessments, and both face-to-face and remote technical interviews
- Produced and maintained 5 IP rich deep learning microservices with a demo frontend written in React to showcase to potential clients, leading to ~ $1 million dollars in project leads

Senior Consultant at Capgemini - Insights & Data
Jan 2018 - Jun 2019
📍 **Manchester, UK**
Capgemini I&D aims to Drive digital transformation through AI, Analytics & Platform.

- Involved with every facet of Data Science. Scoping, architecting, and leading data science projects & implementations
- Technical lead for product development teams of around 8 people
- Responsible for the designing and development of advanced models, as well as high-value use cases
- Worked with vague (and complicated) project requirements from clients, while understanding how to evaluate and discover the best approaches to modelling

Consultant at Capgemini - Insights & Data
Oct 2016 - Jan 2018
📍 **Manchester, UK**
Capgemini I&D aims to Drive digital transformation through AI, Analytics & Platform.

- Developed a number of fast-moving PoCs where I had to consolidate my skills in a business context

- Put into practice the theoretical knowledge of statistics and data science I had gained from university.
- Practiced and proven in delivering no-compromise work under extreme pressure.
- Used a range of techniques including predictive analytics, machine learning (ML), traditional statistics and geo spatial analysis through Agile methodologies.
- Developed algorithms for leak detection for leading UK water utility companies.
- Collaboratively worked with internal and external consultants to deliver impactful insights to clients.

PROJECTS

Atlas Grazing at Atlas Carbon
May 2025 - Current
📍 **Melbourne, AU**

Skills acquired: React Native | Expo | tRPC | Hono | TypeScript | Kubernetes | PostgreSQL | SQLite | S3 | AWS | Datadog | Next.js | Full Stack | Chargebee | Terraform | Offline-First

Architected and delivered a full-stack offline-capable mobile and web application for graze management in the agricultural sector. Built a modern TypeScript-based system with tRPC backend, Expo/React Native mobile/web app with SQLite for offline functionality, and Next.js web admin interface, all deployed on Kubernetes infrastructure.

- Architected and delivered an offline-first mobile application using React Native and Expo with SQLite for local data persistence and robust synchronization.
- Designed and developed the sync layer on both the mobile app and backend using a command queue pattern to ensure reliable data synchronization between offline and online states.
- Built a type-safe full-stack system using tRPC for end-to-end TypeScript across mobile, web, and backend services.
- Deployed scalable infrastructure on Kubernetes with PostgreSQL, S3, and comprehensive monitoring via Datadog.
- Integrated Chargebee for subscription management and billing automation.
- Delivered both mobile (iOS/Android) and web (Next.js) experiences from a unified TypeScript codebase.

Network Data Platform at United Energy | Victoria Power Network
Feb 2025 - May 2025
📍 **Melbourne, AU**

Skills acquired: AWS Redshift | PostgreSQL | Oracle | dbt | Airflow | Python | R | Node.js | Rundeck | SQL Migration | AST Parsing

Led the estimation of 50+ use cases and applications for migration from on-premise Postgres/Oracle to the newly built Network Data Platform (NDP) on AWS Redshift. Developed a custom effort calculator leveraging AST parsing to extract key migration metrics and generate relative effort estimates.

- Assessed and estimated migration effort for 50+ applications moving from on-premise Postgres/Oracle to AWS Redshift.
- Developed a custom AST parsing tool to extract key SQL migration metrics and automate effort estimation.
- Mapped dependencies across Python/R/Node.js applications, identifying blockers and migration risks.
- Designed a strategy to transition Rundeck jobs to Airflow and refactor raw SQL scripts into dbt workflows.
- Provided actionable insights to optimize SQL translation for Redshift compliance while ensuring performance.

Parental Leave at the World
Sep 2024 - Feb 2025
📍 **Melbourne, AU**

Skills acquired: How to be a dad

Spent 18 weeks enjoying every minute with my son while travelling around the world.

Rover | GraphRAG AI Accelerator at RMIT
Jul 2024 - Sep 2024
📍 **Melbourne, AU**

Skills acquired: GraphRAG | LLM | GenAI | LangChain | LangGraph | Neo4j | RAG | Postgres | pg_vector | Pulumi | Next.js | AWS | Full Stack

Architected and developed a fullstack AI system leveraging GraphRAG, LangGraph agents, and multi-LLM tokenization for financial tracking. The system integrates knowledge graphs (Neo4j), vector databases (pg_vector), and natural language Cypher query generation to enhance factual lookups and structured data retrieval.

- Developed a GraphRAG-based AI system combining knowledge graphs (Neo4j) and vector databases (pg_vector) to enhance factual accuracy.
- Implemented multi-LLM token-based cost optimization, dynamically routing requests to different models based on budget and complexity.
- Built custom LangGraph agents capable of generating and executing Cypher queries for structured knowledge retrieval.
- Deployed a scalable fullstack AI architecture using SST (Pulumi), Next.js, AWS ECS, RDS, and ECR.
- Accelerated GenAI adoption at Slalom, with the solution reused in multiple enterprise AI projects.

Marketplace at SafetyCulture
Mar 2024 - May 2024

📍 **Melbourne, AU**

Skills acquired: Software Engineering | Full Stack | Golang | gRPC | React | Commercetools | Algolia | Stripe | Postgres | Kafka | S3 | AWS | Terraform | JIRA

Designed and architected multiple gRPC microservices for a 'Content Marketplace' for SafetyCulture customers to publish/sell and buy/import templates, courses and documents. Making use of SaaS integrations such as Commercetools, Algolia and Stripe for the eCommerce capabilities.

- Lead the technical architecture of the microservices, advising on software architecture, feature delivery and testing strategy
- Created multiple PoC's to test the feasibility of the project, including a 'proof of concept' for the integration of Kafka, Commercetools and Algolia
- Created a backlog of work for the team to deliver on with a roadmap and t-shirt sized estimates for the work to be done

Drive at SafetyCulture
Apr 2023 - Dec 2023

📍 **Melbourne, AU**

Skills acquired: Software Engineering | Full Stack | Golang | gRPC | React | Postgres | Kafka | S3 | AWS | Terraform | JIRA

Architected and deployed a high-performance document management microservice (Golang + gRPC + Kafka + S3 + Postgres) that enabled a 'Google Drive' like experience for SafetyCulture customers to store, manage and share their documents and folders.

- Lead the technical delivery of the microservice, advising on software architecture, feature delivery and testing strategy
- Designed custom data model from scratch to emulate Google Drive including nested folders, sharing permissions and file versioning
- Collaboratively worked with SafetyCulture to release the feature to end users and gather feedback for future iterations

Merchants System at Prezzee
Aug 2022 - Dec 2022

📍 **Melbourne, AU**

Skills acquired: Software Engineering | Full Stack | Python | FastAPI | Django | React | DynamoDB | OpenTelemetry | Datadog | S3 | SecretsManager | Fargate | AWS | Terraform | JIRA

Designed and built a fullstack microservice with a plugin system to allow for the easy integration of new merchants into the Prezzee platform and non developers to configure the Merchant settings

- Created a sophisticated plugin system that allowed developers to inherit from a base class which would make use of the type hints to automatically create the frontend form input for configuration
- Pioneered the use of distributed tracing within the Prezzee teams, allowing for the existing rich monitoring dashboards to continue to be supported in the microservice world
- Deployed using containerization on AWS Fargate with auto scaling, running on minimal hardware which shrunk the AWS costs considerably down to 100's per month for a globally distributed service
- Supported the next phase of work for managing Inventory and integrating with the new Merchants microservice

Notifications System at Prezzee

May 2022 - Aug 2022

Melbourne, AU

Skills acquired: Software Engineering | Full Stack | Python | Django | DynamoDB | OpenTelemetry | Datadog | Stripo | S3 | Lambda | AWS | Terraform | JIRA

Designed and built a serverless notifications microservice to replace part of the existing monolith system and allow it to scale at peak traffic events. The system was built using event driven architecture and a choreography pattern to ensure that the system could scale horizontally.

- Migrated existing HTML Jinja templates to chosen SaaS provider called Stripo which allowed for a non developer to modify the templates in a drag-and-drop manner
- Migrated Datadog dashboards to the new microservice to ensure that the team could monitor the new system in the same way as the old system

ERA Application at RMIT
Nov 2021 - Dec 2021

Melbourne, AU

Skills acquired: Software Engineering | Full Stack | Java | Spring Boot | React | Postgres | DMS | AWS | JIRA

Designed and built a full stack (Spring + Postgres + React) application to allow field of research advisors to align to the ERA process, this was a fully featured application, which included; custom workflow management, triggering and receiving notifications for users and strict Role Based Access Controls. (RBAC)

- Lead the technical delivery of the application, advising on software architecture, feature delivery and testing strategy
- Collaboratively worked on features/bugs in both the backend and the frontend of the application
- Stretched laterally across into Software Engineering to support the delivery on an upcoming deadline

Data Backbone at Services Australia
Jul 2021 - Oct 2021

Adelaide, AU

Skills acquired: Data Engineering | Full Stack | FastAPI | React | MongoDB | Qlik Attunity | JIRA

In this part time project (40% capacity role) we designed and built a full stack (FaRM) application to monitor and democratize the data replication jobs across SvA

- Supported the team as a technical advisor and collaboratively sculpted the solution design document
- Utilized previous open-source work and development accelerators to build application scaffolding to ensure that team members could hit the ground running and not be blocked for their build tasks

Control Testing Automation at ANZ
Jun 2021 - Oct 2021

Melbourne, AU

Skills acquired: Data Engineering | Project Management | Proposal | Agile | JIRA

In this part time project (25% capacity role) we designed and built integrations from ServiceNow to Qlik Sense for the purpose of automating processes and exposing where SLA's were not being adhered to across the bank

- Worked with internal stakeholders, both technical and functional to ensure solution met all requirements for data movement throughout multiple environments
- Advised the team on the technical direction to move around blockers in innovative ways making use of fake data and reducing coupling points
- Proactively groomed and managed the backlog of work to ensure sprint planning sessions were short and sharp to reduce meeting effort required by team so they could concentrate on the problems at hand

Marketing Data Strategy at FoxTel
May 2021 - Jun 2021

Melbourne, AU

Skills acquired: Data Strategy | Marketing | Advertising | Architecture | Proposal | Roadmap

In this project we proposed a horizon based roadmap and technical architecture to enable FoxTel to leverage data across its multiple brands and distribution channels

- Researched and architected a platform capable of handling customer, advertising and streaming data across multiple channels (digital and linear)
- Collaboratively crafted a high level technical implementation roadmap with top down approximations for both team size and skill estimation and overall costings both CapEx and OpEx
- Presented and reviewed the strategy with senior stakeholders from FoxTel, incorporating feedback into both the roadmap and architecture

LENS: Life Event Notification System - Birth of A Child at Services Australia
Mar 2021 - May 2021
 Adelaide, AU

Skills acquired: AWS | Python | Docker | Kubernetes | TDD | Zeebe | Kafka | Nifi | JIRA

In this short term, part time project I performed the role of technical lead where I was responsible for the delivery of the solution which was to build a pipeline that would distribute life events to government agencies such as the ATO, Centerlink and Medicare

- Developed and deployed an event driven solution to production with the source code developed externally to SvA, showcasing the new preferred delivery model by separating the need for data from the solution
- Designed an open-source JSON schema data faker that enabled the delivery of this project to simulate the data that would be present in production. The open source project is available here - jsf

Cognitive Document Handling at Services Australia
Jul 2019 - May 2021
 Adelaide, AU

Skills acquired: AWS | Python | Docker | Kubernetes | TDD | OpenCV | PyTorch | ONNX | FastAPI | TensorFlow | Dash | React | BitBucket | JIRA

In this project I performed a highly technical role with an emphasis on leadership, which has been paramount to its technical excellence and rigor, I pushed new boundaries within Services Australia and set the bar high for quality output. We were challenged to meet strict SLA's for which I architected the end to end solution with sign off from the client.

- Solution Lead for a $5 million-dollar account
- Provided technical direction for a fully remote team of 35 people, plus client stakeholders
- Deployed a production deep learning system in centerlink with an error rate of < 0.1% serving hundreds of thousands of Australians per day
- Managed the delivery of 6 products, 100% on time and beyond the client's expectations, adapted to the client's requests and changing stake holder landscape by rapidly iterating on feedback and improvements showing the flexibility and adaptability of our team
- Organized weekly lunch and learns, pair programming sessions, and out of hours mentorship
- Considered a role model project, both internally and on the client side during corona virus pandemic, demonstrating how the remote working model can scale

Data Hub at NAB
Jan 2019 - Jul 2019
 Melbourne, AU

Skills acquired: AWS | Python | Kafka | Hive | Jenkins | Terraform | Docker | TDD | WatchDog | Flask | GitHub | JIRA

The project was to build a enterprise wide data platform in the cloud (AWS) that would manage the data and it's distribution across the bank. Delivery speed was a key issue so Andy assembled a team to build an automation framework for ingesting over 250 data sources along with the representative meta data.

- Architected and built a self service micro-service for registering data sources to a data platform specifically for files being sent via SFTP.
- Built a horizontally scalable (EC2/Docker) Python daemon that monitored file-system events (EFS) and triggered custom data flows for each object, such as; moving to specified dynamic S3 paths (S3), triggering a custom transformation job (Jenkins), automated un-compressing, clearing from file system (EFS)
- Advised team members on deployment strategies (Terraform), unit testing (PyTest), alerting/logging (SNS + Splunk), documentation standards and containerization
- Lead an automation squad consisting of 8 people within NAB to help deliver a centralized self service data platform.

- Had a major impact on software practices within squads by; creating reusable distributed packages for other teams to take advantage of, building tactical tools to increase the work-flow and automation of manual data ingestion – effectively cutting ingestion time from 6 weeks down to 2 (allowing for business approvals and procedures).
- Built user interfaces (Flask, Javascript, HTML, CSS) for other squads to use that speed up their validation efforts for data ingestion.

Automated Form Processing at HMRC
Jun 2018 - Aug 2018

◆ Telford, UK

Skills acquired: AWS | Python | Docker | Javascript | Frontend | TDD | TensorFlow | OpenCV | GitLab | JIRA

Built and implemented a full scale solution for processing P11D (expense) forms using a custom tool leveraging Google Tesseract OCR and OpenCV.

- Created a private light GUI client which would be used to verify and process the output of the models predictions by an agent.
- At the end of the trial the result was over 25 times faster throughput of forms; which in turn saved HMRC staffing from peak numbers of 120 down to 10. The output of the validation also created training data to be used to create a more sophisticated model in the future.

Facial Recognition & Analysis API at Home Office
May 2017 - Feb 2018

◆ Croydon, UK

Skills acquired: Python | Docker | Swift | Javascript | Frontend | TDD | Jenkins | PostgreSQL | TensorFlow | OpenCV | BitBucket | JIRA

Created a production ready containerized Facial Recognition and Analysis API using Python's OpenCV, DLib and Flask. This was used as part of an application process to access the quality of images. Specifically if they adhered to ICAO standards for machine readable images.

- Created unit tests and a full web front-end as well as a mobile application developed in Swift.
- Developed a custom suite of Python libraries to speed up development, such as connecting to our JIRA instance, logging/interacting with Rocketchat and connecting to our database & incorporating commonly used functions/data types.
- Worked with the platform team to push Continuous Integration with GitLab using Jenkins and Docker containers.
- Technical lead on a scenario to engineer full-scale automated pipelines from inception through to beta phase, presented to users in a front-end tool.

Automated Leakage Detection at Thames Water
Feb 2017 - Apr 2017

◆ London, UK

Skills acquired: IBM Bluemix | Python | R | Time Series | Geo Spatial | Docker | Folium | BitBucket | JIRA

Designed interactive mapping visualizations using both open source technologies for PoC and full-scale integration's with IBM's IOC for PoV which links the users' decisions to the operations.

- Developed algorithms for detecting leaks in pipes using multiple data sources: pressure, flow, pipe attributes, environment and smart meters.
- Mentoring junior staff and delivering `lunch and learn' talks on hot topics.

Design of Data Science Competition at DSTL
Dec 2016 - Jan 2017

◆ Manchester, UK

Skills acquired: Python | TensorFlow | OpenCV | Docker | GitHub | JIRA

Designed a data science competition (logo recognition in videos) for datasciencechallenge.org which was sponsored by the client.

- Created tutorials for ways in which to achieve an out-of-the-box baseline result using TensorFlow.
- Curated images and videos for the competition from both paid-for and CC0 sources.

Predicting Reservoir Demand at Thames Water
Nov 2016 - Nov 2016

London, UK

Skills acquired: R | BitBucket | JIRA

Developed reservoir prediction algorithms for predicting how long water in underground reservoirs will last depending on demand. We overlaid a cost model for electricity and fines to find an optimal solution for the life cycle of reservoirs.

Data Science Platform at Department of Work and Pensions
Oct 2016 - Nov 2016
 London, UK

Skills acquired: Docker | GitHub | Kubernetes | JIRA

Involved in architecting a data science platform that took advantage of JupyterHub, Docker Swarm, Hadoop, AWS and multiple kernels (Python, R, Julia, Scala etc).

EDUCATION

Master of Science - Medical Statistics at Lancaster University
2015 - 2016
Grade: First class, magna cum laude

Bachelors of Science - Mathematics & Statistics at Lancaster University + Texas A&M
2012 - 2016
Grade: First class, magna cum laude

A Levels at Sale Grammar School
2010 - 2012
Grade: A*AAB

AWARDS

Imagination Paragon Award at ISG
2020
Solution lead for the project where we were recognized our innovative and impactful collaboration for 'Document Management Modernization through Intelligent Automation'

Inventor of the Quarter at Capgemini Invent
2020
Gained recognition from senior leadership within Capgemini Invent for being 'a role model with impact'

Academic Scholarship at Lancaster University
2012

Honors Student at Texas A&M University
2014

LANGUAGES

English
Native Speaker

German
Intermediate

INTERESTS

Tech

Skills acquired: LinkedIn Posts | Website Blogs | Opensource

Sports

Skills acquired: Lacrosse | Rugby

REFERENCES

" Andy's leadership on the Services Australia project has been incredible, continually going above and beyond for the work we are delivering for the client, resulting in client feedback such as 'we never have a doubt that you guys can deliver' due to Andy's tech leadership. Andy also has shown incredible leadership focusing on building people and the team to make sure everyone succeeds, by building skillsets and fostering a culture & environment of innovation. With the inclusion of client teams and constant client involvement in technical aspects of the project, Andy has excelled on inclusively working with the client to upskill and bring them along the journey of this project. "

Jeremiah Mannings | Associate Director

" Throughout my 25+ year career, I can categorically state that he is one of the most impressive professionals I have had the pleasure to work with. Any project Andy is involved in will be a success and I look forward to working with him again "

Benjamin Moretti | Senior Manager

" Andy is a very high calibre data scientist. Andy is hard working and committed on projects. He is quick to learn and is able to apply his learnings and technical skills into real life scenarios. He has a strong technical skillset both in terms of data science but also frontend development. He is an effective team player and good communicator. "

Oliver Cochrane | Director

" Andy is a very enthusiastic, committed and talented Data Scientist, working with Andy on technically challenging OCR project revealed all of those facets in great depth. Andy was able to join an established team, quickly get up to speed and not only contribute to the development, he improved the accuracy and also the quality of the work being undertaken. I was very impressed with his skill set and dedication and would hope to work together with Andy again in the future, a genuine asset to any employer. "

Paul Sylvester | Senior Engineer

" Andy joined my team as a critical point in delivery of a high-profile project. He was quickly able to get up to speed with the approach we'd taken to date and improve the solution we were developing. He brought in ideas and worked hard to prove them. He has excellent technical knowledge, is able to adapt what he knows to customer projects quickly, can identify key areas for focus, and works hard to deliver them. I would fully recommend Andy to any data science / machine learning project, and would actively look to have him on my team again "

Mark Strefford | Engagement Manager