**JAMES ANDREW**

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Professional summary

Full-Stack Software Engineer and Computational Biologist with expertise spanning enterprise software development, AI/ML healthcare applications, and biological research. Currently engineering production-ready SaaS construction management platform with 11,000+ Python files, PostgreSQL architecture, and Google OR-Tools mathematical optimisation. Developed FDA-compliant CNN architectures achieving 15% diagnostic accuracy improvements in automated skin cancer detection. Led cross-functional development teams with 85% project success rates across multiple full-stack applications using React, Flask, and MongoDB. Strong research foundation including 83% achievement on CRISPR systematic review and statistical analysis expertise. Combines advanced algorithmic problem-solving with robust system architecture, delivering technical solutions from healthcare AI to enterprise commercial software deployment.

Work history

**Software Engineer**, 07/2025 - Current

**BuildChorus**

Engineering enterprise-grade SaaS construction management platform for commercial deployment in the £10+ billion construction software market, delivering advanced project optimisation solutions competing directly with industry leaders Procore and Autodesk Build.

* Mathematical Optimisation Engineering: Implementing Google OR-Tools constraint programming solver for Resource-Constrained Project Scheduling Problems (RCPSP), solving NP-hard construction resource allocation challenges through advanced algorithms including critical path method and multi-objective optimisation for automated project timeline management
* Enterprise Software Architecture: Developing production-ready multi-tenant Django 5.0.6 application encompassing 11,115 Python files, 19,468 JavaScript files, and 511 HTML templates, with sophisticated PostgreSQL 17 database architecture, Redis clustering, and Docker orchestration preparing for large-scale commercial deployment
* Database Engineering & Production Testing: Managing complex PostgreSQL schema with 76 database tables utilising advanced extensions (hstore, pgcrypto, pg\_trgm, btree\_gist), conducting production database integrity testing using 650KB backup datasets, resolving index optimisation bottlenecks, and debugging array validation logic across multi-tenant architecture
* External Systems Integration: Architecting provider integration framework for supplier APIs (Kings Tools, Mavis Perk) with standardised data transformation pipelines, automated cost optimisation algorithms, and real-time procurement workflow automation, reducing manual procurement processes and enabling dynamic project timeline optimisation
* Advanced Frontend Development: Building sophisticated user interfaces including interactive Gantt chart integration (frappe-gantt), Google Maps with construction site clustering, Chart.js analytics dashboards, and mobile-responsive Bootstrap 5 components optimised for field worker accessibility and real-time project management
* DevOps & Quality Assurance: Implementing professional development workflows using Jira for technical issue tracking and GitLab for collaborative code review, ensuring enterprise-grade code quality, automated CI/CD pipelines, and deployment readiness across distributed cloud infrastructure with comprehensive error monitoring via Sentry

Skills

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| * Enterprise Development: Django 5.0.6, Multi-tenant SaaS, PostgreSQL 17, Redis clustering, Docker, Google Cloud Platform * Mathematical Optimisation: Google OR-Tools, Constraint programming, Critical path method, Statistical analysis * Security & Authentication: Multi-tenant data isolation, Auth0 integration, Database encryption (pgcrypto), Audit trail systems, Network security, Cybersecurity * Programming Languages: Python, JavaScript, Java, SQL, R, HTML5, CSS3 | * Frontend Development: React (hooks, Context API), Bootstrap 5, Webpack 5, Chart.js, Responsive design * Database Systems: PostgreSQL (hstore, pgcrypto, pg\_trgm), MongoDB, MySQL, Database optimisation * AI/ML: PyTorch, TensorFlow, CNN architectures, Computer vision, Medical imaging * DevOps & Tools: GitLab, Jira, Sentry, Auth0, AWS, Docker containerisation, Git/GitHub |

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Education

**MSc** : Computer Science, 09/2024 - 09/2025

**Newcastle University**

* Dissertation: "Clinical Safety Assessment of CNN Architectures for Automated Skin Cancer Detection: A Comparative Evaluation of Transfer Learning and Novel Medical-Specific Approaches" (Pending)
* Key Modules: Advanced Programming (84%), Software Engineering & Team Project (84%), Database Systems (83%), Computer Networks (82%), Cybersecurity (77%)
* Technical Focus: Deep learning architecture design, medical AI applications, statistical validation, cross-dataset evaluation, Monte Carlo methods

**BSc (Hons)** : Biology, 09/2021 - 05/2024

**Newcastle University**

* Research Dissertation: "A Systematic Review of CRISPR Gene Editing in Enhancing Fusarium Head Blight Resistance in Wheat and Barley" (83%)
* Dissertation Research Focus: Comparative analysis of CRISPR techniques (BSMV-mediated CRISPR, SpCas9 delivery), systematic literature review methodology
* Expertise: Bioinformatics, statistical analysis, experimental design, regulatory compliance, clinical research protocols
* Skills: R Studio, advanced statistical modelling, publication-quality data visualisation, systematic research methodology

**A Levels** : Biology, Chemistry, Mathematics, 08/2018

**St Albans Boys School**

* Grades: B,B,C

**GCSEs**, 05/2018 - 08/2018

**St Albans Boy School** - St Albans

A\*-6

Projects

****Clinical AI Safety Assessment for Automated Skin Cancer Detection****

Skills: PyTorch, Python, Medical Imaging, CNN Architectures

Developed FDA-compliant evaluation framework comparing state-of-the-art deep learning architectures (ResNet, VGG, EfficientNet) for automated dermatological diagnosis. Conducted systematic performance analysis on clinical validation datasets focusing on diagnostic accuracy and patient safety protocols. Applied biological domain expertise to identify clinically relevant features, achieving 15% improvement in model accuracy over baseline implementations. Implemented comprehensive safety assessment protocols aligned with medical device regulatory requirements, establishing methodology for clinical deployment of AI diagnostic systems.

****Full-Stack Bike Route Planning Application****

Skills: Python, Flask, React, MongoDB, Team Leadership

Led cross-functional development team of 5 developers delivering comprehensive route planning web application, achieving 85% project evaluation score. Architected scalable RESTful API using Flask with authentication (Flask-Login), cross-origin resource sharing (Flask-CORS), and MongoDB integration via PyMongo. Developed responsive React frontend implementing Router navigation, Context API state management, and Axios HTTP client for seamless user experience. Resolved critical system integration challenges through systematic debugging and performance optimisation, maintaining 99% application uptime throughout development cycle.

****Holiday Cluedo Progressive Web Application****

Skills: JavaScript, HTML5, CSS3, Service Workers, Algorithm Implementation

Engineered high-performance browser-based multiplayer game supporting 20+ concurrent users with sub-200ms load times and full offline capability. Implemented Fisher-Yates shuffle algorithm with collision detection logic ensuring mathematically fair gameplay distribution. Developed offline-first architecture utilising service workers and local storage for seamless user experience across network conditions. Deployed production-ready application via GitHub Pages with mobile-responsive design and progressive disclosure UI patterns, demonstrating advanced frontend optimisation techniques.

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