ADRIAN MIRCEA NENU
// software engineer at Google & Morgan Stanley, MBCS, IEEE Senior, SocRSE

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ACADEMIC EXPERIENCE

MSc Business Analytics *University of Bath* **2020 — 2024**

Machine Learning, Statistics (R), Modelling and Forecasting, Data Mining (Python), Heuristics, Databases (SQLite), Optimisation & Simulation Techniques (VBA), Business Intelligence (IBM, PowerBI, Tableau), Project Management and Collaborative Projects.

BSc (Hons) Computer Science with Industrial Experience *University of Manchester* **2013 — 2017**

Advanced Algorithms, Mathematics, Logic and Modelling, Engineering (CAD, Verilog, MU0), Computation, Operating Systems, Compilers, Advanced Computer Graphics, Distributed Computing, Software Engineering, User Experience, Leadership in Action.

Micromasters Data Science and Statistics *MIT - Massachusetts Institute of Technology* **2025 — 2026**

Probability, Statistics, Machine Learning (Python), Statistical Modelling and Computation, Capstone Exam in Statistics and Data Science.

RESEARCH EXPERIENCE

- At Google, worked on (research and patents for) the development of graph-orchestration, memory and RAG for multi-agent, cross-modal LLMs for cloud architecture generation, from prototyping and evaluation to productionisation and deployment.

- At Morgan Stanley, led investigative projects on graph DBs & algorithms to answer novel questions in dynamically interconnected data.

- MSc thesis on methodologies for clustering market data to enhance investment strategies, aiming by identifying asynchronous patterns in historical financial indices data, benchmarking Dynamic Time-Warping, Euclidean K-Means and Self-Organising Maps Neural Networks against Silhouette Score, Calinski-Harabasz, Davies-Bouldin indices and visual observations to evaluate clusters, employing multi-threaded computational techniques to decrease model training times, supervised by Dr Sheik Meeran.

- BSc project and thesis on a solution for non-intrusive snapshotting of the internal state of live production applications during critical failures, with a minimum runtime performance impact. Approach: Native JVM Agents (in C++) using the Java Native Interface (JNI), with custom data structures, multi-thread processing, and storage in Mongo through an API built in Scala, allowing for detailed state reconstruction visualised through a responsive web interface (MVC framework, LAMP), supervised by Prof Caroline Jay.

MEMBERSHIPS & ORGANISATIONS

- *IEEE.org* - Senior Member (2024), *Lead of Volunteering Platform Management* (2025), paper reviews (ICDCC2024) and recommending members for senior advancement. Primary member of the Computer Society, Computational Intelligence Society, and Young Professionals.

- *BCS.org - MBCS - Member & Mentor -* demonstrating competent, ethical and accountable software development.

- *Society of Research Software Engineering (SocRSE)* - Software engineering applied to research, bridging academia and the industry.

AWARDS

- *Leading with Exceptional Ideas* - Morgan Stanley Global Tech Excellence Awards
- *Seven Senior Leadership & 21 Peer Awards* - Google

CERTIFICATIONS & COURSES

- *Artificial Intelligence Programme* - Saïd Business School, University of Oxford
- *Psychology: Introduction* - University of Oxford – Lifelong Learning
- *Calculus: Intermediate* - University of Oxford – Lifelong Learning
- *Technology Analyst Program* - Morgan Stanley – 2017
- *Deep Learning & Machine Learning Specialisations* - Coursera certs
- *Reinforcement Learning & TensorFlow* - Coursera certs
- *ML Statistical Foundations* - Wolfram Research
- *AWS Associate Developer & Google Cloud Professional* – 2023

PROFESSIONAL EXPERIENCE

Google Cloud Observability – Software Engineer, Cloud Distributed Infrastructure - US **AUG 2024 — PRESENT**

- Develop in and optimise system performance of graph-based control surface of Monarch, a planet-scale, in-memory time series database (C++) used for monitoring operational metrics of hundreds of thousands of servers, with Petabytes of data queried millions of times/second (gRPC), with internal and external stakeholders, tackling bottlenecks, dependency-graph algorithmic optimisations, memory/thread leaks (sanitising tooling, profiling).

- Engineering high-performance queue-based data processing pipelines running across thousands of servers in parallel, achieving a 90% reduction in processing time - from days to hours, with integrated automated retry mechanisms, throttling and real-time monitoring to improve resilience and efficiency, using C++, ProtoBuf protocols, Spanner database, Abseil abstractions and the custom Bazel build system.

- Using Go, Python, and C++, develop tooling to enhance system debuggability and reliability, significantly reducing operational toil in critical scenarios.

- Mentorship and coaching for professionals across the company, guidance for external students (e.g. BASTA), and development support for non-profits.

Google Cloud – Software Engineer, Cloud GTM - US & UK **SEP 2023 — AUG 2024**

- Implemented a custom multi-agent multi-modal graph-based orchestration framework in Python, similar to LangChain, with in-built error-recovery, automated retries, and graph-based dependency management and data flow, allowing for complex chaining to be designed through a UI (Angular, Java) and executed reliably at scale, empowering the sales team, generating deployable cloud architectures, diagrams (Go) and security controls (GCP).

- Researched multiple approaches for using multimodal Generative AI alongside custom training and Retrieval-Augmented Generation (RAG) to generate cloud architectures, infrastructure as code (Terraform, YAML) and diagrams as code (Graphviz, Mermaid.js, D3) using Java, Python and TensorFlow.

- Data-driven (Google Analytics, Looker Studio, Jupyter), development of external customer-facing cloud architecture recommendations portal (Java, Python, Spanner, Angular, TypeScript, Figma), connecting client requirements to deployable end-to-end cloud solutions (GCP).

Google Ads – Solutions Engineer - UK   APR 2022 — SEP 2023

- Open-sourced Angular and NodeJS tool for 3rd-party HTML/JS tag performance assessment using Puppeteer browser automation, reducing manual work for identifying optimisation opportunities. Conducted data research using Chrome User Experience data in Looker and BigQuery on Real User Monitoring and Lab synthetic data from Lighthouse audit data, aiming to improve Core Web Vitals and sales through dashboards and automation.
- Built automated Looker dashboard generation using NodeJS, Apps Script and BigQuery to track metrics over time and perform competition analysis.
- Developed multi-threaded Java tooling for bulk scanning of thousands of websites with data sourced from the Page Speed Insights API, extracting insights and transforming data, analysing trends visually in Looker, reducing manual effort from weeks for multiple people to minutes for one person.

Morgan Stanley – Senior Software Engineer - UK   AUG 2017 — MAR 2022

- Received award for *Leading with exceptional ideas* for technical leadership and the development of services, using Spark, Scala, Java, Teradata, DB2, H2, optimised for processing larger data volumes than ever before, enabling efficient year-on-year comparisons and ML applications using TensorFlow and Apache Airflow orchestration, alongside enhancing user interfaces and usability, improving data handling speeds by 1000% (C# WPF, Angular).
- Machine learning-driven natural language generation pipelines built in Scala and Python for quantitative data analysis and reporting in LaTeXformat on daily trends changes, leveraging the Extract-Transform-Load infrastructure, delivered directly to traders.
- Managed an agile team by providing technical leadership, establishing KPIs, resolving conflicts, removing blockers, and managing stakeholders. Authored technical design documents, prioritised tasks based on data insights, and offered technical guidance and career mentoring.
- Led multiple task forces in resolving critical production outages, using debugging tools such as AppDynamics, Dropwizard metrics, JVisualVM, Snoop, ELK, Graphana, Prometheus, Wireshark. Addressed tactical challenges under time pressure, leveraging monitoring data and forensic techniques.
- Migrated business clients from hundreds of manual processes and thick clients (C#, WPF) to scaled data visualisation platforms, Tableau & PowerBI, building systems for automating cross-data-lake extracts in Spark, Scala, Java and Angular, and introducing audit-compliant entitlements integration.
- Designed multiple fit-for-purpose Kibana, Splunk, and custom dashboards for Site Reliability Engineers, developers, and Finance users, analysing logs at scale to enhance visibility into and transparency of UI interactions, performance tuning, KPI tracking, and backend server stats.

Morgan Stanley – Software Engineer, Industrial Placement - UK   JUN 2015 — JUN 2016

- Researched the reduction of production management toil by developing a Neo4j graph database-based dependency monitoring and visualisation framework in Scala and Java, able to replay ETL batches interactively, with an API to automate SLA breach detection, reporting and alerting. Deployed as a micro-service, using cross-process synchronised state via Zookeeper and Hazelcast, with graph visualisations built in D3.js and Angular.
- Data analytics gathering through a custom JVM JNI agent used in a large-scale distributed batch execution engine to identify unused JVM classes, submitting a proposal for code reduction by 40%. Identified opportunities for compressing gathered data and reducing duplication of records to scale out the project while allowing for performance-aware centralisation of the results in H2 using Memory Mapped Files.

Startups – CTO // Tech Lead - UK   2013 — 2017

- *Romanian B2C Medical Tourism Platform (2014 - 2017)* – GDPR-compliant digital platform that facilitated connecting global patients with Romanian dental clinics across the country, in collaboration with a business co-founder: Development of a web platform and administration portals using Scala, PHP, NodeJS, Zookeeper (configs), and MySQL, with a scalable micro-service mesh architecture deployed on AWS. End-to-end DevOps practices: test-driven development (TDD) and continuous integration/delivery (CI/CD), SDLC with bash automation, Jenkins and AWS for 15 repositories.
- *NextGame Sport UK* (2016 - 2017) – robust sports club management solution that integrated advanced features for customer engagement and rewards via ross-platform mobile apps (Ionic, React Native, Flutter), with a focus on usability, iterative development of a Scala, Java and NodeJS service mesh (AWS, Azure) of 20 repositories including Chat, Notifications, SQL & NoSQL Databases, REST API, Analytics & distributed Configurations (Zookeeper, ETL using Python, Scala, and NodeJS), crunching data from multiple sources, enabling live updates and reducing manual toil.
- *Goliath Gaming* (2015 - 2016) – Framework for native integration of data gathering and analysis into games (PHP, Python, NodeJS, Azure, AWS).

VOLUNTEERING

2013 - present – ***BrainBee Romania*** Developing the web contest platform (LAMP) for the annual BrainBee neuroscience competition.
2024 - 2025 – ***G/V-SWEP - US*** - collaboration between Google, Basta and Marcy Labs School for CS and real-world career training.
2022 - 2023 – ***Camden Giving UK*** - Empowering children from underprivileged backgrounds to use creativity to change the world, developing an online comic creator with integrated analytics and web shop, leading to the creation of film featuring the children's work.
2014 - 2015 – ***Junior Development Labs*** - Teaching web development to senior high-school students in Romania.

SKILLS & EXPERTISE

Programming: C++, Python, Scala, Java, PHP, JS, C#, Swift, Go, C	**Graph**: Tableau/PowerBI/Looker, D3/Viz.js, Plotly, Seaborn
Analysis & ML: R, Spark, Scikit, TensorFlow, PyTorch, Numpy, Tslearn	**Research Writing**: LaTeX, Patent Filing, Peer Reviews
Web Design & Dev: HTML5, CSS3, Angular, React, Bootstrap	**Game Dev**: Godot, Unity, Unreal, OpenGL, Vulkan, CUDA
DB: Graph, Relational, Time-Series, Columnar, Document, Key-Value	**Languages**: English & Romanian - Basic Reading: French

SPOTLIGHT PROJECTS

- Graphics Engine – Light game engine, experimenting with C++ architecture, entity-component-systems, shaders, sound, graphics, and Lua/C# dynamic-library-based scripting, GLFW, ImGui, OpenGL/Metal/Vulkan, bgfx, writing cross-operating-system code.
- RPG Config API – Configuration-Graph Driven Game Management API for AI Generation of online RPG Games through a custom YAML format. Supporting dependency-based game economy definitions with interdependent formulas, automatically visualised.
- Other Projects: iOS Geo Map Rendering – Unity Geo Tiles – ANTLR Custom Compiler – PHP MVC Framework – RCU Benchmark

Eight professional recommendations are available on LinkedIn. Additional references can be provided on request.