ADRIAN (MIRCEA) NENU

// PhD Researcher, prev. Google & Morgan Stanley - <u>UKYA</u>, <u>SocRSE</u> Trustee, <u>CITP BCS</u>, <u>IEEE Senior</u>

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ACADEMIC EXPERIENCE

PhD Computer Science *University of Manchester* **2025 — PRESENT**
Postgraduate Artificial Intelligence, Reinforcement Learning, LLM reasoning research student.

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.

RESEARCH EXPERIENCE

- In my PhD, I am exploring methods for reinforcement learning in the LLM transformer space and control alike, with a focus also on reasoning, agentic development, and graph transformers. Part of <u>Agent Lab</u>, supervised by <u>Dr Mingfei Sun</u>.

- At Google, worked on research and <u>patent</u> 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.

- <u>MSc thesis</u> on methodologies for clustering market data to enhance investment strategies 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, employing multi-threaded computation, supervised by <u>Dr Sheik Meeran</u>.

- <u>BSc project and thesis</u> on a solution for non-intrusive snapshotting of the internal state of production applications during critical failures, with minimum performance impact. Native JVM Agents (C++) using Java Native Interface (JNI), custom data structures, multi-thread processing, MongoDB, Scala API, for visualised state reconstruction, supervised by <u>Prof Caroline Jay</u>.

MEMBERSHIPS & ORGANISATIONS

- *UK Young Academy* - **Member (2026/31)** - researchers, innovators and professionals from across society who share a passion to improve our world, we work together to contribute to national and global decision-making and change.

- *Society of Research Software Engineering* - **Trustee (2025/26)** - A world which relies on software must recognise the people who develop it.

- *IEEE.org* - **Senior Member** since 2024, **Volunteering Subcommittee Chair for Young Professionals (YP) Committee** (2026), **Lead for Volunteering Platform Management** (2025), stakeholder management and requirement gathering, recommending members for senior advancement.

- *Google Developer Groups on Campus* - **Senior Technical Expert** since 2025, leading workshops for University of Manchester students of all years on AI, Google Cloud, distributed computing and career development.

- *BCS.org* - **Chartered IT Professional (CITP) MBCS & Mentor**, demonstrating verified competent, ethical and accountable software development.

PATENTS & AWARDS

- *US20250343728* - Agentically-Orchestrated Foundational Models for Cloud Architectures
- *Seven Senior Leadership & 22 Peer Awards* - Google
- *Leading with Exceptional Ideas* - Morgan Stanley Global Tech Excellence Awards

CERTIFICATIONS & COURSES

- *Micromasters Data Science and Statistics* - MIT - Massachusetts Institute of Technology (2025 - PRESENT) - Probabilities, Statistics, ML.
- *Artificial Intelligence Programme* - Saïd Business School, University of Oxford
- *Deep Learning & Machine Learning Specialisations* - <u>Coursera certs</u>
- *Psychology: Introduction* - University of Oxford – Lifelong Learning
- *Reinforcement Learning & TensorFlow* - <u>Coursera certs</u>
- *Calculus: Intermediate* - University of Oxford – Lifelong Learning
- *ML Statistical Foundations* - Wolfram Research
- *Technology Analyst Program* - Morgan Stanley – 2017
- *AWS Associate Developer & Google Cloud Professional* – 2023

PROFESSIONAL EXPERIENCE

GOOGLE **UK & US**
Google Cloud Observability – Software Engineer, Cloud Distributed Infrastructure - US **AUG 2024 — SEPT 2025**

- Optimized system performance of graph-based control surface of <u>Monarch</u> (C++), a planet-scale, in-memory time series database for monitoring operational metrics of the global server fleet, with Petabytes of data queried millions of times/second (<u>gRPC</u>), with internal and external stakeholders, tackling bottlenecks, dependency-graph algorithmic optimisations, memory/thread leaks (<u>sanitising tooling</u>, <u>profiling</u>).

- 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 (C++, <u>ProtoBuf</u> protocols, <u>Spanner</u>, <u>Abseil</u>, <u>Bazel</u>).

- 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. <u>BASTA</u>), and 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 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 an 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.
- 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   **UK**
MS – Senior Software Engineer   **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, using monitoring data and forensic techniques.
- Migrated business clients from hundreds of manual processes and thick clients (C#, WPF) to scaled data visualisation platforms, Tableau & Power BI, 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.

MS – Software Engineer, Industrial Placement   **JUN 2015 — JUN 2016**

- Reduction of SRE/PM toil by developing a graph dependency monitoring (Neo4j, Scala, Java) and visualisation (D3.js, Angular) framework, able to replay ETL batches interactively, with SLA breach detection, automated reporting/alerting, cross-process synchronisation (Zookeeper, Hazelcast).
- Custom JVM JNI agent used in a large-scale distributed batch execution engine to identify unused code, proposing 40% code reduction. Focus on high-performance and concurrency, data compression and centralisation in H2 using Memory Mapped Files.

STARTUPS – CTO // Tech Lead - UK   **2013 — 2017**

- *Romanian B2C Medical Tourism Platform (2014 - 2017)* – GDPR-compliant digital platform connecting global patients with clinics across the country, in collaboration with a business co-founder: Scala, PHP, NodeJS, Zookeeper, and MySQL, with a scalable 15 AWS micro-service mesh.
- *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 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).
- *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 Development: 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