ADRIAN M. NENU

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EDUCATION

MSc Business Analytics *graduated Merit at University of Bath, UK* **2020 — 2023**

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

BSc (Hons) Computer Science with Industrial Experience *awarded 2:1 at University of Manchester, UK* **2013 — 2017**

- Advanced Algorithms, Mathematics, Logic and Modelling, Computer Engineering (CAD, Verilog, MU0), Computation (Automata), Operating Systems, Compilers, Graphics and Image Processing, Distributed Computing, Compilers, Software Engineering, UX Design.

RESEARCH EXPERIENCE

- Patent submitted for research on *Orchestrated Foundational Models for Cloud Architecture Development* conducted at Google.
- MSc Dissertation on Dynamic Time-Warping (DTW) for clustering market data to enhance investment strategies through the identification of asynchronous patterns in the S&P 500 and NASDAQ 100 indices, benchmarking against Euclidean K-Means and Self-Organising Maps neural networks, using Silhouette Score, Calinski-Harabasz & Davies-Bouldin indices to evaluate clustering. Visualised results and employed multi-threaded data processing to decrease model training times. Supervisor: Dr. Sheik Meeran.
- BSc Project and Dissertation on a solution for non-intrusive JVM agents for capturing of the internal state of live production applications during critical failures, with a minimum runtime performance impact. Built Native Agents using C and the Java Native Interface (JNI), building custom data structures, using multi-thread processing, and storing information in Mongo through an API built in Scala, allowing for detailed state reconstruction visualised through a responsive web interface (MVC framework, LAMP). Supervisor: Dr. Caroline Jay.
- Research Interest in Machine Learning & Mathematics with application in Robotics, Biotech, Materials and Quantum Computing.

PROFESSIONAL EXPERIENCE

Google Cloud Monitoring - Software Engineer, Large Scale Distributed System - US **AUG 2024 — PRESENT**

- Implementing features in the graph-based control interface of Monarch, a planet-scale, in-memory C++ time series database used for monitoring operational metrics of thousands of servers across data centres, with Petabytes of in-memory data queried on-demand, millions of times per second via gRPC. Each feature benefits internal stakeholders and Google Cloud (GCP) customers. Investigate and optimise system performance by identifying and resolving bottlenecks and memory leaks, leveraging specialised tooling, pprof profiling, and Address, Memory, Thread, and Leak Sanitizers.
- 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. Integrated automated retry mechanisms, throttling, and real-time monitoring to enhance resilience and efficiency, utilising C++, ProtoBuf protocols, Spanner database, Abseil abstractions and the custom Bazel build system.
- Developing tooling to enhance system debuggability and reliability, significantly reducing operational toil in critical scenarios, using Go, Python, C++.
- Providing mentorship and coaching for professionals across the company and the world, alongside mentorship for external students (e.g. BASTA).

Google Cloud - Software Engineer, AI - 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 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 recommendation generation web portal (Java, Angular, Python, Spanner), connecting client requirements to deployable end-to-end Cloud solutions (GCP).

Google Ads - Solutions Engineer - UK **APR 2022 — OCT 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 and BigQuery to track metrics over time and perform competition analysis.
- Developed multi-threaded Java data-analysis tooling for scanning bulk of thousands of websites for data from Page Speed Insights API, extracting insights and transforming data, and analysing trends visually in Looker, reducing manual effort from weeks & multiple people to minutes for one person.

Morgan Stanley - Senior Software Engineer, Data Analytics - UK **AUG 2017 — MAR 2022**

- Received award for ***Leading with exceptional ideas*** in recognition of leading the development of services, using Spark, Scala, Java, Teradata, DB2, H2, optimised for processing larger data volumes than previously possible, enabling efficient year-on-year comparisons and machine learning using TensorFlow and Airflow, alongside enhancing user interfaces and usability, improving data export and import speeds by 1000% (C# WPF, Angular).
- Deployed machine learning with natural-language generation pipelines built in Scala and Python for quantitative data analysis and reporting in LaTeXformat on daily changes in trends, leveraging Extract-Transform-Load infrastructure, delivered directly in the hands of traders.

- Led an agile team by providing technical leadership, resolving conflicts, removing blockers, and managing stakeholders. Authored technical design documents, prioritised tasks based on data insights, and offered technical guidance and career mentorship.
- 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 using hundreds of manual spreadsheets to scaled data-visualisation platforms such as Tableau and PowerBI, building systems for automating cross-data-lake extracts in Spark, Scala, Java, and Angular, also 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 graph database (Neo4j) 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, and graph visualisations were built in D3.js and Angular.
- Performed 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**

- *Dental Tourism in Romania* (2015 - 2017) - the creation of a GDPR-compliant digital platform that facilitated dental tourism in Romania, serving as a secure platform connecting international patients with local dental clinics:
  - Development of a web platform built on Scala, PHP, NodeJS, and MySQL micro-services architecture deployed on AWS, enabling scalability and independent deployment of individual services such as Data Analytics and Dashboards, Search Services, and Session management.
  - Employed DevOps practices such as test-driven development (TDD) and continuous integration/continuous delivery (CI/CD) with Jenkins and AWS of over 15 Git repositories with Python and Bash.
- *NextGame Sport UK* (2014 - 2015) - robust sports club management solution that integrated advanced features for customer engagement and rewards:
  - Cross-platform mobile apps (Ionic, react Native, Flutter), with a focus on usability not only functionality, privacy-aware data-gathering, analysis, and iterative development of a Scala, Java and NodeJS service mesh of 20 repositories including Chat, Notifications, SQL & NoSQL Databases, REST API, Analytics & distributed Configurations, with scaled cross-instance coordination via Zookeeper.
  - Implemented data pipelines using Python, Scala, and NodeJS, crunching data from structured and unstructured sources, enabling live updates and reducing manual long-term toil, deployed to AWS and Azure.

ACADEMIC & COMMUNITY SERVICE

- *IEEE Senior Member* - Peer reviewing conference paper submissions (e.g. AI papers for ICDCC-2024) and recommending members for advancement within IEEE. Member of: Computer Society, Computational Intelligence Society, Robotics and Automation Society.
- *Comic Mania - UK* - Empowering children from underprivileged backgrounds to use creativity to change the world. Developed an online comic creator with integrated analytics and a web shop, enabling the non-profit to create a short film featuring the children's work.
- *Romanian BrainBee* - Developed and maintained the web & data platform for the Romanian National stage of an annual international neuroscience competition, BrainBee, successfully hosting and engaging hundreds of students.

AWARDS & CERTIFICATIONS

- *5 Mgmt. Spot Bonuses & 20 Peer Bonuses* - Google - 2022 - 2024
- *Leading with exceptional ideas* - Morgan Stanley - 2021
- *Google Cloud - Professional Cloud Developer* - 2023
- *DVA-C02 AWS Certified Developer - Associate* - 2023

SPOTLIGHT PROJECTS

- Light Game Engine - Basic game engine, built to experiment with complex C++ projects, and implementing shaders, sound, graphics, and scripting, with an entity graph (component-entity-system) editor. Experimented with GLFW, ImGui, OpenGL/Metal/Vulkan, bgfx and others to leverage computations on the GPU and write cross-operating-system code.
- RPG Config API - Configuration-Graph Driven Game Management API for Online RPG Games AI Generation via YAML files. Supporting graphs based on dependency definitions and definitions of game economy via interdependent formulas.
- iOS Geo Map Tile Rendering - Unity Geo Tiles - ANTLR Custom Language Compiler - Custom PHP MVC Framework

SKILLS

- **Programming**: C++, C, Python, Scala, Java, C#, Swift, Go, JS
- **Analysis & ML**: R, Spark, Scikit, TensorFlow, PyTorch, Numpy, Tslearn
- **Web Development**: PHP, NodeJS, HTML5, CSS3, Angular, React
- **DB**: Neo4j, MySQL, SQLite, MSSQL, Spanner, BigQuery, Mongo
- **Visuals**: Tableau, PowerBI, D3, Plotly, Matplotlib, Seaborn
- **Research Writing**: LaTeX, Patent Filing, Peer Reviews
- **Graphics**: Godot, Unity, OpenGL, Vulkan, Shaders
- **Languages**: English & Romanian - Basic Reading: French

Six professional recommendations are available at nenuadrian.com/recommendations. Additional references can be provided upon request.