Andrew Mayes

www.linkedin.com/in/andrew-mayes-2763a716a

andrewmayes14@hotmail.com

+61489912397

Machine Learning Engineer at re:mind

Sydney, New South Wales, Australia

About

Machine Learning Engineer specialising in training, fine-tuning, and deploying deep learning models, including **Large Language Models (LLMs)**, **Vision-Language Models (VLMs)**, **Vision Transformers (ViT)**, and **Embedding Models**, to derive actionable insights and produce impactful business solutions. Skilled in building and scaling end-to-end machine learning pipelines using **Docker** for containerisation, **AWS Lambda**, **S3**, and **PostgreSQL** for seamless integration, and robust APIs with **FastAPI** to enable secure and efficient access to model outputs. Passionate about delivering real-world AI solutions, including automating data labeling and validation, transforming unstructured data into structured formats, and streamlining document extraction to optimise business processes. A proactive self-starter and collaborative team player who thrives in cross-functional, multi-domain projects, continuously seeking innovative approaches to drive value across various fields.

Publication

Mayes, A. and Anwar, A., 2022. Machine Learning Based IDS for Cyberattack Classification. In Explainable Artificial Intelligence for Cyber Security: Next Generation Artificial Intelligence (pp. 93-111). Cham: Springer International Publishing.

Experience

Machine Learning Engineer

re:mind | March 2024 – Present | France (Remote)

Focused on transforming unstructured document data into actionable insights through the application of **natural language processing** (NLP), **computer vision**, and **generative AI** technologies. Leveraged **large language models (LLMs)**, **Vision Transformers (ViT)**, **Visual Language**

Models (VLMs), and **optical character recognition (OCR)** to develop end-to-end automated solutions, streamlining document processing, enhancing user experience, and driving key business outcomes.

Key Achievements:

- **Automated Data Collection (Computer Vision):** Built a scalable web scraping pipeline using **Google Lens** and other **OCR** tools, automating data acquisition with computer vision techniques to reduce manual input, increasing both the speed and accuracy of data collection.
- **Conversational Diagnosis (Natural Language Processing, Generative AI):** Developed a contextualised chatbot leveraging **LLMs** with **Retrieval-Augmented Generation (RAG)**, enabling personalised responses based on user and product contexts. This significantly enhanced user engagement and satisfaction.
- **Document Type Classification (Computer Vision):** Created a high-accuracy document type classification model using **SwinV2 (ViT)** architecture, streamlining the document identification process and reducing manual review time.
- **Content Extraction (NLP, Computer Vision):** Deployed advanced **LLM** and **OCR**-based extraction techniques to capture essential document data, significantly improving the accuracy and dependability of data extraction workflows.

Technical Skills:

- **Large Language Models & Vision Models (Generative AI, NLP, Computer Vision):** Proficient in leveraging OpenAI and Hugging Face models for tasks in NLP and computer vision, with hands-on expertise in **SwinV2** and **ViT** architectures.
- **OCR & Computer Vision Tools:** Skilled in **Google OCR** and **Google Lens** for robust document digitisation and data extraction, supporting complex data acquisition needs.
- **Cloud Infrastructure (MLOps):** Experienced in using **AWS** (Lambda, S3, CloudWatch) for the scalable, cost-effective deployment and monitoring of machine learning pipelines.
- **API Development:** Skilled in **FastAPI** and **Django** for developing high-performance APIs that support seamless integration of machine learning solutions.
- **Cross-Functional Collaboration:** Collaborated with developers, data validators, and stakeholders to ensure efficient project execution and deliver impactful results.

Data Scientist – Network Security & Fraud Detection

La Poste Groupe | September 2021 – February 2024 | Nantes, France (Hybrid)

Specialised in applying **machine learning**, **natural language processing (NLP)**, and **graph analytics** to enhance network security measures and drive financial fraud detection initiatives.

Key Contributions:

- **Network Activity Forecasting (Time-Series Analysis, Predictive Modeling):** Developed a network anomaly forecasting system using the **Temporal Fusion Transformer (TFT)** in **PyTorch**, boosting the precision of preemptive security actions by anticipating potential threats.
- **Graph-Based Fraud Detection (Graph Analytics):** Leveraged **Neo4j** to create and analyse graph-based transaction models, revealing intricate fraud patterns and relationships through graph analytics and advanced query techniques, significantly enhancing fraud detection capabilities.
- **Banking Network Analysis (Graph Visualisation, Behavioral Analysis):** Constructed complex visualisations of transaction networks to trace and examine behavior patterns associated with fraudulent activities, aiding in the identification of high-risk entities.
- **NLP for Threat Detection (Natural Language Processing, Cybersecurity):** Implemented advanced **NLP** methods to parse and analyse **Juniper command-line logs**, enabling automated detection of suspicious command patterns and improving incident response times.
- **Deep Learning for Anomaly Detection (Embedding, Neural Networks):** Built and optimised **LSTM** and **Autoencoder** models for identifying unusual network behaviors, utilising **PyTorch** for efficient training and real-time anomaly detection in high-stakes cybersecurity environments.
- **Log Data Analysis & Incident Response (Automation, Monitoring):** Automated log analysis workflows with **Splunk**, creating dynamic alerts and dashboards that improved monitoring, accelerated incident detection, and enhanced response coordination.

Technical Skills:

- **Programming Languages:** Skilled in **Python** for data science, model development, and automation.
- **Machine Learning & Deep Learning Frameworks:** Extensive experience with **PyTorch**, **LSTM**, **Autoencoders**, and **Temporal Fusion Transformer** for time-series analysis and anomaly detection in security applications.
- **Graph Databases & Analytics:** Expertise in **Neo4j** for fraud detection through relationship analysis and complex querying.
- **Cybersecurity Monitoring & Analysis:** Proficient in **Splunk** for log management, real-time monitoring, and incident response workflows.
- **Operating Systems:** Experienced with **Linux (CentOS)** for secure server management in network security operations.

Data Scientist Intern – Computer Vision & Deep Learning

Institut de Neurosciences de la Timone (CNRS) | February 2021 – May 2021 | Marseille, France

Developed and deployed **computer vision** models, applying **deep learning** techniques and **experimental design** for neuroscience research focused on visual attention mechanisms.

Key Projects:

- **Inhibition of Return Mechanism Simulation (Neuroscience, Computer Vision):** Designed neural models in **PyTorch** to replicate the inhibition of return—a visual attention mechanism that suppresses attention to previously attended locations in image sequences. This project provided insights into the neural basis of attention in both artificial and biological systems.
- **Dataset Augmentation & Simulation (Data Augmentation, Computer Vision):** Used **NumPy** to create dynamic simulations within the **MNIST** dataset by introducing background motion, improving model robustness in computer vision tasks and testing model performance in variable environments.
- **Experimental Design & Human-Equivalent Testing (Behavioral Analysis, Experimental Design):** Conducted controlled experiments with **PsychoPy** to evaluate neural network performance against human visual attention benchmarks, bridging insights between artificial intelligence and human cognitive responses.

Technical Skills:

- **Deep Learning Frameworks:** Experienced in **PyTorch** for neural model development, training, and performance assessment.
- **Data Manipulation & Augmentation (Computer Vision):** Proficient with **NumPy** for custom dataset modifications, generating synthetic data to simulate real-world conditions.
- **Experimental & Simulation Tools (Neuroscience Research):** Skilled in **PsychoPy** for designing and running cognitive and behavioral experiments that assess model alignment with human visual processing.

Lab Assistant – EEG Data Analysis

University of Newcastle | February 2018 – September 2018 | Central Coast - Ourimbah (On-site)

Assisted in neuroscience research by conducting **EEG experiments** and performing **data analysis** to gain insights into neural activity and psychological assessments.

Responsibilities:

- **Participant Management (Behavioral Research, Experimental Design):** Screened, recruited, and onboarded participants for EEG

studies, ensuring protocol compliance to support reliable research outcomes.
- **EEG Setup & Monitoring (Neuroscience, Signal Processing):** Configured EEG equipment, optimised electrode placement, and ensured signal quality to capture accurate neural data, contributing to effective data acquisition for brainwave analysis.
- **Psychological Assessments (Behavioral Analysis, Psychometrics):** Conducted and interpreted assessments for anxiety, depression, and psychopathy, enabling data-driven psychological profiling to correlate with neural findings.
- **Data Analysis (Dimensionality Reduction, Neuroscience):** Employed **Principal Component Analysis (PCA)** and other statistical techniques to identify patterns in EEG data, providing valuable insights into neural activity that enhanced study findings.

Technical Skills:

- **Data Analysis & Statistical Techniques:** Experienced in **PCA** and other advanced statistical methods for signal processing and dimensionality reduction in EEG data.
- **Neuroscience & Data Acquisition (Signal Processing):** Proficient in EEG setup, electrode placement, and signal optimisation for high-quality neural data capture.
- **Psychometric Testing & Evaluation (Behavioral Science):** Skilled in administering and analysing standardised psychological assessments to support integrated research in cognitive neuroscience.

Education

Deakin University

Master of Data Science

Key Skills Acquired:

- **Data Analytics & Machine Learning**: Mastery in machine learning, statistical data analysis, and real-world analytics through coursework in Machine Learning, Statistical Data Analysis, and Mathematics for AI. Skilled in practical data wrangling for structured and unstructured data.
- **Software Development & IT Foundations**: Proficient in object-oriented programming, database fundamentals, and software requirements analysis, supported by courses such as Object-Oriented Development, Database Fundamentals, and Web Technologies.
- **Advanced AI Techniques**: Extensive experience in Bayesian learning, deep learning, and modern data science, acquired through Bayesian Learning, Deep Learning, and Modern Data Science modules.
- **Collaborative Project Execution**: Strong project management and teamwork skills gained through team-based projects, including Project Management and Practices and Execution and Delivery, focused on managing data science projects from planning through to delivery.

OpenClassrooms

Machine Learning Engineer Graduate Diploma (Master's Level, Bac +5)

Key Skills Acquired:

- **Data Preparation & Analysis**: Cleaning, transforming, and visualising structured and unstructured data.
- **Predictive Modeling & Machine Learning**: Designing and deploying predictive algorithms, including supervised and unsupervised models, deep learning (CNNs for image classification), and NLP for text processing.
- **MLOps & Deployment**: End-to-end lifecycle management of models using cloud platforms (AWS, Google Cloud), version control (Git), and monitoring in production.
- **Advanced Technical Proficiencies**: Python (Jupyter, Git, Streamlit), MLFlow, Databricks, Hadoop/PySpark, and cloud computing for scalable data solutions.
- **Project-Based Experience**: Completed industry-aligned projects such as energy consumption forecasting, e-commerce client segmentation, and predictive modeling of user behaviors.

OpenClassrooms

Data Analyst Graduate Diploma (Bachelor's Level, Bac +3/4)

Key Skills Acquired:

- **Data Collection & Analysis**: Aggregating, cleaning, and interpreting data to derive insights.
- **Statistical Analysis & Hypothesis Testing**: Conducting descriptive statistics, statistical modeling, and testing hypotheses for data-driven decisions.
- **Data Visualisation & Reporting**: Creating impactful reports, dashboards, and presentations for various stakeholders.
- **Technical Proficiencies**: SQL, Python, R, data visualisation tools (e.g., Tableau), and statistical libraries.
- **Project-Based Learning**: Completed multiple hands-on projects, including public health studies, market analysis, sales data analysis, and predictive modeling for business insights.

University of Newcastle

Bachelor of Psychological Science

Key Skills Acquired:

- **Research Methods & Statistics**: Developed expertise in research design, data analysis, and psychological measurement through courses

like Advanced Research Methods and Statistics and Advanced Psychological Measurement.

- **Core Psychological Knowledge**: Gained in-depth knowledge in cognitive psychology, biological psychology, and mental health through core courses, including Cognitive Psychology, Biological Psychology, and Introduction to Mental Health.
- **Advanced Specialisations**: Specialised in applied areas like health psychology, social and organisational psychology, and developmental psychology, covered in Advanced Health Psychology and Advanced Developmental Psychology.
- **Applied Learning and Professional Practice**: Completed Work Integrated Learning in Psychology, providing hands-on experience in real-world settings to enhance employability and practical skills in psychology.
