HEET PATEL

Data Science & Machine Learning Engineer

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Portfolio | LinkedIn | GitHub

Award-winning Data Science graduate dedicated to streamlining your daily operations by integrating Python programming with everyday business tools like Excel. I bring proven professional experience in enhancing data workflows and delivering clear, actionable insights using various tools (Pivot Tables/Charts, Macros, Matplotlib) that allow teams to make swift decisions. Alongside this hands-on expertise, my rigorous academic foundation in machine learning (TensorFlow, Keras) and RESTful API development (FastAPI, Django REST) equips me to scale your technical infrastructure and deploy advanced deep learning solutions as your company's data needs grow.

PROFESSIONAL EXPERIENCE

Data Analyst Intern

Future Centre Storage & Distribution Ltd **| Aylesbury | Summer 2024**

- Leveraged advanced Excel functionalities, including Macros, Pivot Tables, and V/X Lookup, to build a reliable tracking and analytics dashboard that, in turn, reduced fulfilment delays and proactively identified bottlenecks for international logistics.
- Translated data gathered from the dashboard to turn into practical strategies, collaborating directly with procurement, sales, and warehouse teams.
- Engineered automated reporting systems using Google Sheets, Excel, and Microsoft Teams, transforming raw logistics data into actionable intelligence for management decision-making.

Data Analyst Intern

Astute Healthcare **| Aylesbury Office | Summer 2023**

- Guided executive decision-making during the acquisition of DocPharm GmbH by conducting advanced European pharmaceutical market analysis using Excel.
- Provided insights to reduce purchasing costs by engineering a data extraction script in Python on a Belgian SAM (Authentic Source of Medicine) database system, automatically gathering competitor pricing to enrich internal datasets and optimise procurement strategy.
- Streamlined cross-border product management by designing a German-to-English inventory database using Python and Excel. Built an automated pipeline that expanded foreign acronyms, translated terminology, and utilised cosine similarity metrics to achieve accurate inventory code matching, eliminating manual translation overhead.

PROJECTS

Routine Grid - Habit Tracking Platform: A centralised web app that allows users to easily log, track and visualise (currently in development) both time-based activities and daily habits. I architected a production-ready RESTful API backend using Django REST framework with JWT authentication and Pydantic Data validation, which will seamlessly integrate with a reactive NextJS frontend featuring a GitHub-inspired calendar for an intuitive user experience.

LintData - Automated Data Quality Assurance Framework: An open-source Python tool that instantly detects data quality issues, such as missing or duplicate information across large datasets using a single line of code. To eliminate manual data checking and cleaning, I engineered this custom pandas validation library with intelligent anomaly detection algorithms, implementing automated testing and integrating workflows via GitHub actions to deploy to PyPI.

Serenity - Community Management System: An automated moderation bot successfully deployed across 65+ Discord servers to actively prevent spam by dynamically regulating chat message rates without manual intervention. Processing thousands of messages across 65+ servers, the system was built on async Python architecture using the Hikari framework, featuring real-time channel monitoring and SQLite-based configuration persistence.

Reverse Engineer Shazam: Awarded the departmental Best Mathematics Project Award for successfully recreating Shazam's music recognition technology by converting audio into visual spectrograms and matching their unique digital fingerprints. I developed the complex signal processing backend using Python, Librosa, and NumPy to apply advanced Fourier techniques and spectral hashing, paired with a NextJS frontend for a simple user experience.

EDUCATION

BSc Data Science - First Class Honours

Nottingham Trent University **| September 2022 - July 2025**

Research Projects:

Audio Fingerprinting Algorithm Recreation

- Reverse-engineered and implemented Shazam's proprietary music recognition system using advanced spectral analysis
- Developed custom signal processing pipelines, achieving sub-8-second audio matching capabilities on a local machine
- Architected a full-stack solution with NextJS frontend and optimised SQL hash storage
- Authored a comprehensive 90-page technical dissertation detailing mathematical foundations

Deep Learning Computer Vision System

- Retrained convolutional neural networks (Resnet50, EfficientNetB0) for the classification of music album artwork
- Achieved ~70% classification accuracy through ensembling modelling.
- Integrated the Spotify Web API with a local SQLite database to create a contextually-aware conversational AI system

Big Data Analytics Platform

- Orchestrated multi-node Hadoop cluster for large-scale vehicular accident analysis
- Implemented MapReduce algorithms for severity-based incident clustering

TECHNICAL EXPERTISE

Business Intelligence: Advanced Excel Skills (Macros, VBA, Pivot Tables), Microsoft Suite, Google Suite

Programming & Frameworks: Python (Advanced), TensorFlow/Keras, FastAPI, Django REST Framework, JavaScript/TypeScript, NextJS, SQL, Java

Machine Learning & AI: Neural Network Architecture, Computer Vision (CNNs), Natural Language Processing, CRISP-DM Methodology

Data Engineering & Analytics: PostgreSQL, Hadoop/MapReduce, Distributed Computing, Real-time Data Processing, Pandas, NumPy, Matplotlib, Seaborn, Minitab Statistical Analysis

Cloud & DevOps: JWT Authentication, Asynchronous Programming, RESTful API Design, Git Version Control, CI/CD Pipelines (Github Actions)

KEY ACHIEVEMENTS

Academic Excellence

- **Best Mathematics Project Award**, Nottingham Trent University Department of Mathematics - Awarded for dissertation reverse-engineering Shazam's proprietary audio fingerprinting algorithm using advanced Fourier analysis
- **First Class Honours Graduate** - Achieved the highest classification in BSc Data Science with exceptional performance across machine learning, big data, and statistical analysis modules.
- **Student Union Course Representative** - Elected to represent Data Science and Computer Science (w/ Math) cohorts, advocating for curriculum improvements and student interests