Josephine Burke

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Profile

As a Computer Science with Data Science student, I approach Systems Engineering with a focus on software reliability and data precision. I possess a strong technical foundation in Python and mathematics, enabling me to analyze complex sensor data and contribute to the development of robust, mission-critical architectures. I am eager to join Northrop Grumman and utilize my background in software development and testing to help design and verify systems that deliver superior situational awareness. I am driven by a passion for solving 'impossible' problems and am ready to support the lifecycle of technologies that protect global security.

Education

University College Dublin Dublin, Ireland

B.Sc. Computer Science with Data Science *Sept 2023 – May 2026 (Expected)*

- Technical Officer — AI in Medicine Society; organize AI/ML events promoting responsible technology in healthcare.
- Clubs: Networking Society, Women in STEM, Lacrosse, Sub-Aqua.

Experience

United States Marshals Service — Behavioral Analysis Unit June 2025 – Aug 2025

Software Engineering Intern — Washington, D.C.

- Developed a modular **Python AI pipeline** to extract, normalize, and visualize key entities (names, dates, locations, organizations) from thousands of investigative files across formats (PDF, DOCX, EML, PPTX).
- Implemented NLP using **spaCy** and **regex** with fuzzy entity resolution, creating structured JSON data for real-time Dash dashboards.
- Built an intelligent search engine supporting exact, case-insensitive, and fuzzy queries with scalable indexing and caching.
- Created visual analytics dashboards (**Dash, Plotly**) to support case discovery and insight generation while reducing manual triage time.
- Collaborated with cross-disciplinary analysts, IT staff, and deputies to deploy and test automation tools on sensitive datasets.

Quantum Computing Research — UMBC July 2022 – Aug 2022

Research Assistant to Prof. Sebastian Deffner

- Explored entanglement-assisted invariance using **IBM Qiskit**; designed, executed, and presented results of quantum circuit simulations.

Projects

Applied AI Data Processing Platform — Built an end-to-end text analytics system for unstructured data ingestion, entity recognition, and visualization; prototyped retrieval-augmented search using vector similarity (**rapidfuzz**, **faiss**).

HexOust (JavaFX Game) — Led team development of a JavaFX board game, integrating algorithmic logic with user-focused interface design.

Data Science with Python — Designed two Python solutions focused on automated data acquisition, cleaning, predictive modeling, and business visualization. This included building a classification pipeline (scikit-learn) to forecast commercial flight delays, where I engineered and rigorously evaluated models using SMOTE and ROC-AUC metrics, and performed Predictive Feature Analysis for interpretability. I also constructed a full data value chain by using Beautiful Soup for web sourcing and Pandas/regex for data cleaning, culminating in Matplotlib/Folium visualizations that extracted key market trends and geographical sales insights from unstructured data.

Technical Skills

Languages: Python, Java, C, SQL, HTML/CSS
Frameworks/Libraries: spaCy, Pandas, Plotly/Dash, scikit-learn, LangChain, Jupyter, Git
Core Areas: AI Engineering, NLP, Intelligent Automation, LLM Pipelines, RAG Concepts, Data Visualization, Cloud Integration (AWS/Azure)
Tools: GitHub, VS Code, IntelliJ, Linux, JSON APIs

Certificates

Elasticsearch (Udemy) — Implemented AI-driven indexing and data retrieval; built Kibana dashboards for analytics.

Intro to Artificial Intelligence (TRAIN) — Created ML models in Python; examined AI ethics and bias mitigation.

Intro to Quantum Computing (Qubit by Qubit) — Programmed and tested quantum circuits in IBM Qiskit.

Carbon Literacy — Currently working towards receiving a carbon literacy certificate from the University of Manchester.

Additional Experience & Activities

Cybersecurity CTF Competitor — Placed in open category at Zero-Days Dublin; competed at University of Galway CTF.

Research — Completed a class on scientific research, and wrote a literature review on predicting human actions via computational technologies.

Ireland Lacrosse Team — Represented Ireland in European Championships and She-Box Tournament.

Learn more: https://josierb.github.io/applications/