ADARSHA PAUDEL

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Professional summary

First-Class BEng (Hons) Electrical & Electronic Engineering graduate with hands-on experience in building sensor-driven systems, data pipelines and prototype **digital twins** that aid operational decision-making. Strong Python developer with applied modelling/simulation, data visualisation and stakeholder reporting. Experienced creating KPI dashboards (Power BI / Next.js), defining requirements, and running verification & validation. Comfortable with sensitive data handling (GDPR-aware) and collaborating across technical and non-technical teams. Seeking to contribute as **Digital Twin Optimisation Associate (MKTP)**, embedding simulation-led planning, optimisation and training to support evidence-based decisions. Awareness of UK policing context and data-governance expectations (publicly available guidance), applied to modelling and reporting. Based primarily on-site at DCP HQ, Middlemoor (Exeter), ready to drive culture change through training and simulation-led decision support.

Key Skills

- **Programming & Data:** Python (NumPy, pandas, scikit-learn), SQL, MATLAB/Simulink; data wrangling, feature engineering, experiment logging.
- **Modelling, Simulation & Optimisation:** System modelling and scenario analysis; link-budget and propagation modelling; parameter tuning & exploratory multi-objective trade-offs (accuracy vs. compute, service level vs. resource). Applied linear programming (PuLP) and exploratory NSGA-II runs for trade-off analysis (foundational).
- **Digital Twin & Systems Engineering:** Requirements → specification → prototype → V&V; state models, telemetry mapping, fault-injection, KPI tracking; documentation and quality gates.
- **Machine Learning & LLMs:** Classical CV (OpenCV), small CNNs (TensorFlow/Keras); anomaly detection; prompt-engineering and RAG for document analytics; explored NL-to-SQL prototypes for analytics.
- **Visualisation & Reporting:** Power BI dashboards, matplotlib; concise technical writing; slide decks and training materials; presenting findings to stakeholders.
- **Data Governance & Security:** Data management plans, versioning, access control, GDPR awareness for operational datasets.
- **Project & Collaboration:** Agile tasking, backlog grooming, risk & dependency tracking; cross-functional collaboration; training & knowledge transfer.
- **Tooling:** Git/GitHub, Next.js/TypeScript (for internal dashboards), Power BI, MATLAB/Simulink, AutoCAD/SolidWorks (basic), Microsoft Project/Visio.

Professional Experience

Technical Analyst & Software Engineer, **June 2024 - Present**
Kingsbury Group of Companies - London

- Built internal analytics dashboards (**Next.js/TypeScript + Power BI**) to visualise production KPIs and machine telemetry, enabling tracking of uptime, throughput and fault events across departments.

- **Prototyped sensor acquisition** (temperature, load, proximity) on ESP32; implemented debouncing/hysteresis and published telemetry via MQTT to real-time dashboards.
- Developed exploratory **predictive-maintenance notebooks** in Python (pandas, scikit-learn) to trend loads/temperatures and flag anomalous deltas for operator response.
- Designed **and executed test procedures**—including PSU current profiling, soak tests and duty-cycle validation—and authored pass/fail reports tied to quality gates.
- Built a lightweight digital-twin prototype of a production asset; defined system boundary and states, mapped live topics to simulated transitions (normal/overload/overheat), and compared expected vs observed behaviour for troubleshooting.
- **Produced SOPs**, quick-start guides and training checklists; delivered hands-on sessions to embed data-led decision-making.
- Planned and monitored near/medium-term work; tracked time/effort and risks/dependencies; issued concise progress notes and brief papers for an internal steering group.
- Coordinated a small cross-functional workstream for the telemetry dashboards and reported progress to managers.
- Maintained a lightweight Data Management Plan (DMP), version control and access controls for operational data in line with **GDPR expectations**.
- Followed health-and-safety procedures during bench and production tests (**risk assessments, PPE, permits**).

Student Proctor – Technical Lab Support, **Sep 2022 – May 2024**
University of Hertfordshire - Hatfield, Hertfordshire

- Supported FPGA, embedded and robotics labs; assisted with **sensor interfacing** and **PCB prototyping** best practices.
- Helped mechanical cohorts with SolidWorks parts and reading of assembly drawings; promoted safe working with high-risk tools and lab equipment.
- Contributed to documentation, posters and demo days; communicated complex concepts simply to varied audiences.

Software Engineering Intern, Feb 2021 – May 2021
Alpha Beta Theta Technologies Pvt Ltd – Kathmandu, Nepal

- Contributed Python scripts and React components; assisted with MongoDB/MySQL integration and REST endpoints.

Selected Projects

Digital-Twin-style Monitoring of a Production Asset

- Defined states and KPIs; mapped telemetry streams to simulated state transitions for validation and fault-finding.
- Implemented fault-injection scenarios and compared expected vs. observed responses; produced concise validation reports and operator guidance.

Scenario optimisation proof-of-concept

- Framed patrol/resource allocation as a multi-objective problem (service level vs. utilisation); tested **linear programming (PuLP)** and a simple **NSGA-II** workflow to explore trade-offs and Pareto fronts.

Smart Shredder Monitoring System – IoT Embedded Prototype

- Designed power budget (duty cycles, quiescent currents) and low-power firmware with SoC monitoring.
- Logged time-series data for **anomaly detection**; published status/alerts to dashboards via MQTT.
- Built a simple state machine to simulate failure modes and compare with live data (twin-style validation).

6G THz Link Budget Simulation (Final Year Project)

- Modelled propagation/attenuation; compared scenarios under different atmospheric parameters; validated with standard references.
- Demonstrated transferability of RF literacy to practical Wi-Fi/LoRaWAN/4G/5G trade-offs for robust telemetry links.
- Investigated signal attenuation under different environmental variables and validated simulation against ITU-R standards.
- Developed simulation blocks with adjustable inputs, parameter tuning, and data collection for visual and analytical comparison.

Design of Safety-Controlled Embedded System

- Engineered a self-prioritising energy control system with automated switching between solar, battery, and grid power sources.
- Worked in a 4-person team to define system requirements, wiring, embedded logic, and integration—all within a one-week sprint.
- Applied circuit design, embedded C++, and systems thinking for reliable switching logic with energy fallback protocols.
- Simulated power prioritisation scenarios with edge-case handling to prevent disruption—mirroring real-world energy management controls.

Dissemination & training

- Produced short guides and a 20-minute walkthrough so non-technical stakeholders could interpret outputs and use twin results in decisions.

AI-Driven Workflow Automation (Self-hosted n8n) ***(Ongoing)***

- Deploying **RAG-enabled AI agents** for document processing over structured datasets; explored NL-to-SQL workflow prototypes for question-answering over internal data with governance controls.

Education

Bachelor of Engineering (BEng) – Electrical and Electronic Engineering (First-Class Honours)
University of Hertfordshire, UK | Sep 2021 - Jul 2024

Final Year Modules:
IoT Systems, Embedded Systems, Digital and Analogue Signal Processing, Intelligent Systems and Robotics

Awards & Roles:
Vice-Chancellor's Award (Open Day Robotics Demo); Student Representative – IET; society contributor (Debate, Photography).

Certifications & Training

- Python, Linux, Git– **Boot.Dev Certifications**
- Data Analysis with Python **– IBM SkillsBuild**
- Generative AI Fundamentals **– Google Cloud**
- Responsible AI **– Google**
- Machine Learning Foundations **– freeCodeCamp**
- Complete MERN Web Development - **Apna College**
- **Currently learning:** OpenCV Bootcamp; strengthening TensorFlow; foundational PLC/HMI and optimisation methods.

Management & EDI

- **Management science mindset** for operations/analytics; comfortable linking technical work to organisational outcomes. **Committed to inclusive practice** when designing training and decision aids.

Additional Technical Stack

- **Languages**: Python, C/C++, JavaScript/TypeScript, SQL, VHDL (intro).
- **Frameworks/Libraries**: TensorFlow/Keras, OpenCV, scikit-learn, React/Next.js, Tailwind, Express.
- **Databases**: PostgreSQL (Drizzle/Prisma), MongoDB (Mongoose).
- **Embedded/IoT**: ESP32/Arduino, sensor buses (I2C/SPI/UART), RT data logging, MQTT.
- **CAD/Tools**: SolidWorks (basic), AutoCAD, MATLAB/Simulink, Git/GitHub, Power BI.
- **Concepts**: Digital twin modelling, energy budgeting, basic RF/EM propagation, edge ML, test planning (bench → field), documentation & training.

Right to Work & Clearance

- **UK Graduate Visa** valid until 13 March 2027; open to Skilled Worker sponsorship.
- **Meets 3+ years UK residency** (for NPPV police vetting) and willing to undergo all required clearances; understands confidentiality and data-protection obligations.
- **Able to be primarily on-site at Middlemoor, Exeter; flexible hours to meet project demands.**

References

References available upon request.