Hussain Sabuwala

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Education

University of Birmingham, Dubai — Dubai, UAE
Bachelor of Engineering in Robotics and Artificial Intelligence — *Sep. 2025 – Jun. 2028 (Expected)*
- Undergraduate Chancellor's Academic Merit Scholarship (30% tuition award)

University of Toronto — Toronto, Canada
Bachelor of Applied Science in Electrical and Computer Engineering — *Sep. 2023 – Dec. 2024*

Experience

New York University Abu Dhabi — Abu Dhabi, UAE
GIS and Remote Sensing Research Intern | Advisor: Dr. Rita L. Sousa — *Mar. 2026 – Jun. 2026*
- Built a 15-month, 90-layer Google Earth Engine (GEE)/QGIS/Python pipeline for Dubai urban heat analysis, integrating Landsat 8/9 surface indicators with ERA5-Land atmospheric variables
- Analyzed class-based heat exposure across urban, vegetation, desert, and water samples using zonal statistics, percentile distributions, median/IQR trends, and Pearson/Spearman correlations
- Developed pixel-level Land Surface Temperature (LST) hotspot persistence maps, a prototype weighted Heat Exposure Index, uncertainty checks, and Streamlit dashboard outputs for journal manuscript preparation

University of Birmingham Rocket Propulsion Labs — Dubai, UAE
System Engineer — *Sep. 2025 – Present*
- Contributed to system-level rocket design documentation for UOBRPL competition campaigns, translating subsystem requirements, design constraints, and UKSEDS NRC 2026/Mach-X rules into engineering-ready reference material

University of Toronto – ESP II — Toronto, Canada
Research Coordinator — *Jan. 2024 – Apr. 2024*
- Quantified 100 system combinations (10 designs × 10 subsystems) using a Pugh matrix and weighted multi-criteria scoring in Excel, ranking architectures against automation, compatibility, and cost objectives
- Synthesized stakeholder requirements into a 70+ page data-backed specification under Dr. Terry Branch (P.Eng, PDR Technologies), translating qualitative inputs into structured recommendations and a final architecture recommendation

Projects

Jacobi | *Python, FastAPI, NumPy, Next.js, Supabase, Bright Data* — Dec. 2025 – Present
- Built Jacobi, a Top 3 project among 2,000+ participants: a full-stack price-auditing platform that runs 24 synthetic-shopper agents to test whether e-commerce prices vary by location, device, cookies, referrer, or language
- Implemented NumPy-based attribution to estimate per-variable price sensitivity as a finite-difference Jacobian, using Welch's t-tests and a gated 0–100 Price Exploitation Index to reduce false-positive claims
- Shipped FastAPI/Next.js/Supabase workflows for site-aware extraction, authentication, ReportLab evidence reports, a Chrome extension, and a 1,310-test `pytest` suite on Vercel/Render

Project Urban | *Python, Pandas, Google Earth Engine, PyTorch, NumPy* — Dec. 2025
- Built an end-to-end geospatial ML pipeline on 7 years of Sentinel-2 imagery across 155,000+ hectares of Dubai, covering data acquisition, feature engineering, model training, and dashboard visualization
- Engineered NDVI, NDBI, MNDWI, and terrain features, then trained a 50-tree Random Forest classifier to forecast 2,936 ha of new urban development by 2027
- Validated satellite-tile labels with a fine-tuned ResNet-18 classifier, reaching 95.53% validation accuracy and documenting the full workflow on GitHub for reproducibility

Agent Sanad | *Python, FastAPI, Policy Engine, Pytest, HTML/CSS* — Jun. 2026
- Built Agent Sanad, a FastAPI decision-support prototype for housing-loan arrears rescheduling, combining a deterministic policy engine, 5 fixture-backed integration adapters, an officer recommendation UI, and a demo API endpoint
- Benchmarked policy decisions against held-out 2025 cases, reproducing 94.6% path-match accuracy and 100% compliance with the 20% cap for updated repayment plans through tested rule logic and audit-ready outputs

Technical Skills

Languages: Python, SQL, JavaScript/TypeScript, C, C++, MATLAB
ML and Statistics: PyTorch, Random Forest, CNN (ResNet-18), transfer learning, model evaluation, statistical testing
Data and Geospatial: Pandas, NumPy, Google Earth Engine, QGIS, Sentinel-2, Landsat 8/9, ERA5-Land, Streamlit, Tableau
Backend and Tools: FastAPI, Next.js/React, Supabase/PostgreSQL, REST APIs, Git/GitHub, `pytest`, Vercel, Render
Hardware and Embedded: Arduino fundamentals, microcontroller prototyping, PCB Design, Autodesk Fusion