

HIMANSHU SAINI

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<https://github.com/himanshusaini11/DataScience>, <https://scholar.google.com/citations?user=OL7M-lwAAAAJ&hl=en>

PROFESSIONAL SUMMARY

Data scientist with 4+ years of computational research and recent applied ML experience. Built and shipped a real-time computer-vision system running 10–15 FPS on device and trained high-recall models for semiconductor yield and credit-risk prediction. Strengths in rare-event classification and cost-sensitive evaluation, with proven results: ~75% recall in manufacturing yield and ~77% in credit risk.

SKILLS

Programming: Python, SQL, Bash, MATLAB
ML/Stats: Pandas, Scikit-learn, Cross-Validation, Calibration, Class Imbalance (SMOTE, NearMiss), SHAP
AI: TensorFlow, PyTorch, Deep Learning
Data Skills: Data Wrangling, EDA, ETL, Data Modeling, A/B Testing
LLMs & Agents: Agentic system design, LLMs (StarCoder2-3B, CodeLlama-7B)
MLOps: FastAPI, Docker, CI-ready workflows
Visualization: Plotly, Dash, Matplotlib, Seaborn, Tableau
Big Data: PySpark, Databricks, Snowflake (working)
Cloud & DevOps: Azure App Service, Azure Databricks, GitHub

PROJECTS

AI: Safe Vision ([GitHub](#)) Aug 2025 – Present

- Built a **real-time hazard scoring system** to surface under-reported micromobility risks, using a **multi-model CV pipeline** (detection, segmentation, depth, video) and a **FastAPI + Postgres/PostGIS** backend with geospatial clustering and hazard-aware routing.
- Shipped a **React Native app** running **ONNX Runtime at 10–15 FPS** on device and packaged the stack with Docker for one-command, reproducible setup.

Agentic AI: Autonomous Code Generation & Debugger ([GitHub](#)) Jun 2025 – Sep 2025

- Created a **self-debugging code generator** that fixes code until tests pass, driven by a doctest repair loop and compatible with **StarCoder2-3B** and **CodeLlama-7B-Instruct**.
- Built a **Streamlit UI** so users can generate code, inspect logs, and download results without touching the CLI.

SECOM Semiconductor Yield Prediction ([GitHub](#)) Apr 2025 – Jul 2025

- Predicted rare wafer failures (~**6.6% base rate**) with **~75% recall**; engineered a **leakage-safe pipeline** and trimmed features **590 to 375** to improve robustness.
- Used **SHAP to highlight the top 5 sensors influencing failures** and ran **cost-sensitive analysis** to balance false negatives vs. false positives for fab impact.

Bank Loan Defaulter Prediction ([GitHub](#)) Jan 2025 – Mar 2025

- Modeled default risk on **67,463 loans (35 features, ~9.25% defaults)** with careful cleaning, encoding, and outlier control.
- Compared imbalance strategies and models: **NearMiss + Random Forest hit ~77% recall**; **SMOTE + SVC reached ~51% recall** with better balance, reported full precision/recall/AUC.

EXPERIENCE

Computational Scientist Sep 2019 – Dec 2023

McMaster University Hamilton, Canada

- Built **WloopPHI**, a Python tool integrated with WIEN2k for Berry-phase and Wilson-loop analysis of Weyl semimetals, **cutting analysis time 60%**.
- Ran DFT studies to **evaluate thermodynamic stability** and **topological phases of quantum materials**, contributing to a **peer-reviewed publication**.
- Developed a **Python module for phase-diagram** and **convex-hull visualization to predict material stability**, supporting screening for **quantum-computing relevant materials**.

Research Institute, SRM University Chennai, India

- Automated **high-throughput DFT workflows for 2D materials screening in Python/Bash on HPCC**, parameter sweeps, batch submission, post-processing, and plotting with reproducible scripts.
- **Modeled MoS₂/2D heterojunctions and g-C₃N₄ quantum dots**; computed band alignment and optoelectronic properties to support solar-cell and photodetector studies.

EDUCATION

- **MASc, Materials Engineering, McMaster University, Canada (3.88/4)** Sep 2019 – Jun 2023
Doctoral studies 2019–Dec 2022; transferred to MASc.
- **M.Tech, Nanotechnology, SRM Institute of Science & Technology, India (3.90/4)** Jul 2014 – Jun 2016

PUBLICATIONS & AWARDS

- **Himanshu Saini**, “Thesis: Development of *ab initio* characterization tool for Weyl semimetals and thermodynamic stability of kagome Weyl semimetals”, McMaster University, 2023. <http://hdl.handle.net/11375/28473>.
- **Himanshu Saini**, Magdalena Laurien, et al., “WloopPHI: A tool for ab initio characterization of Weyl semimetals”, Computer Physics Communications, 2022. <https://doi.org/10.1016/j.cpc.2021.108147>.
- **Graduate/Research Scholarship**, NSERC, Canada, Sep 2019.
- **Junior Research Fellowship**, Ministry of New & Renewable Energy, India, Jul 2016.