

PARAMVEER SINGH

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EDUCATION

Thapar Institute of Engineering & Technology, Patiala

Bachelor of Engineering in Computer Engineering

Aug 2024 – Present

CGPA: 9.49/10.00

Meritorious School, Jagraon

Class XII: 98.3% Class X: 94.7%

2021 – 2024

EXPERIENCE

Research Intern, Experiential Learning Centre (ELC), Thapar Institute of Engineering & Technology

2026

Vision-Based Powder Flow Process Parameter Optimization for Directed Energy Deposition of Waste Metallic Particles Python, OpenCV, Scikit-Learn, Statsmodels

- Built an end-to-end computer-vision pipeline extracting 15 physically-motivated features (stream geometry, density, symmetry, dynamics) from 36 directed energy deposition (DED) powder-flow experiments, using mass-weighted edge detection, dense optical flow, and FFT-based periodicity analysis.
- Designed a multi-criteria decision-making (MCDM) framework combining PCA-filtered TOPSIS, AHP, entropy weighting, and MOORA to rank process conditions, validated via cross-method Spearman correlation ($\rho > 0.7$ across all method pairs) and a 500-trial Monte Carlo sensitivity analysis (100% top-5 stability for the top-ranked condition).
- Identified and corrected a measurement confound via an OLS-based deconfounding regression, isolating genuine stream-quality variation from process-parameter-driven artifacts.
- Physically validated top-ranked conditions via DED printing trials across three spot-diameter zones; findings are being prepared for journal submission (manuscript in preparation).

PROJECTS

Aircraft Engine Predictive Maintenance

PyTorch, Scikit-Learn, Pandas, NumPy

- Developed predictive maintenance models on NASA CMAPSS data using LSTM and Transformer architectures for Remaining Useful Life prediction, achieving RMSE of [16.9] on FD003 ([24.1]% improvement over baseline).
- Implemented an Autoencoder-based anomaly detection framework trained on healthy engine states using PyTorch.
- Performed feature selection, sliding-window preprocessing, and cross-dataset evaluation using RMSE and MAE metrics.

Amazon Supply Chain Intelligence – Delivery Risk Prediction

Python, Scikit-Learn, XGBoost

- Built machine learning models to predict delivery risk levels using a real-world supply-chain dataset, reaching [84.6]% accuracy/F1-score with the best-performing model.
- Performed feature engineering and class balancing using SMOTE; evaluated and compared Random Forest, XGBoost, and Logistic Regression via hyperparameter tuning.

TIES – Campus Mobility Platform

React.js, Tailwind CSS, JavaScript

- Developed the frontend of a campus carpooling platform, including ride search, filtering, sorting, and responsive mobile-first UI components.
- Integrated REST APIs to support ride creation, discovery, and participation workflows, collaborating with backend developers on end-to-end functionality.

SKILLS

Languages: C++, Python, JavaScript, SQL

ML/DL: PyTorch, Scikit-Learn, NumPy, Pandas, Matplotlib

Frameworks: React.js, Node.js, Express.js, MongoDB

Core CS: Data Structures & Algorithms, OOP, DBMS, Operating Systems, Computer Networks

Tools: Git, GitHub, Docker, VS Code, Postman, Jupyter Notebook

ACHIEVEMENTS

- 2× Full Merit Scholarship Recipient, Thapar Institute of Engineering & Technology.
- Gold Medal – InterTech Basketball Tournament (IIT Ropar).
- Silver Medal – Inter-University Basketball Tournament (IIT Mandi).
- 2× Gold Medalist – URJA Sports Fest.

LEADERSHIP & RESPONSIBILITY

- **Basketball Coordinator, URJA Sports Fest** – Coordinated participants and managed execution of large-scale sporting events.
- **Technical Head, VIRSA Society** – Led technical planning and execution for cultural events, coordinating student participation initiatives.
- Represented TIET in inter-university basketball tournaments and contributed to multiple medal-winning performances.