

Guru Nanak Dev Engineering College, Ludhiana
Department of Computer Science & Engineering

Ref No.: _____

Date: 26-12-2025

PROJECT EXHIBITION REPORT

A Project Exhibition was conducted on 19th December, 2025 where all the students of 7th Semester of CSE exhibited their projects. There were 36 groups of students who demonstrated excellent understanding and practical application of concepts through the successful presentation of their major project at the exhibition. The student's major project exhibition reflected creativity, dedication, and strong problem-solving skills.

Out of the 36 projects showcased, top 3 project groups were given Award of Appreciation in the form of a certificate. The top three position holder project groups were:

Group No.	Guide Name	Title of the Project	Student Name	Student Roll No.	Position
G2	Er. Meetali	Explainable Disease prediction using ML and XAI	1. Aayush Kalia 2. Abhijot Singh 3. Khushali Sharma	2203390 2203391 2203487	First
G22	Dr. Kapil Sharma	Campus Connect	1. Mehakveer Singh 2. Prem Singh 3. Ritik Mehta	2203503 2203532 2203541	Second
G17	Dr. Preetkamal Singh/Er. Kuljeet Kaur	Smart Bus Pass Website	1. Jasmine Kaur 2. Komal Heer	2203471 2203491	Third

The Jury Member Committee for the evaluation of projects comprised of:

- Head of the CSE Department : Dr. Kiran Jyoti
- External Experts: Er. Yashpal Singh (Associate Engineer Nagarro, Chandigarh)
Er. Arshdeep Kaur (Associate Engineer Nagarro, Chandigarh)
- Project Co-ordinators CSE: Er. Jasdeep Kaur
Er. Jasmine Kaur
Er. Harkomalpreet Kaur

Some photos of the Project Exhibition are as under:





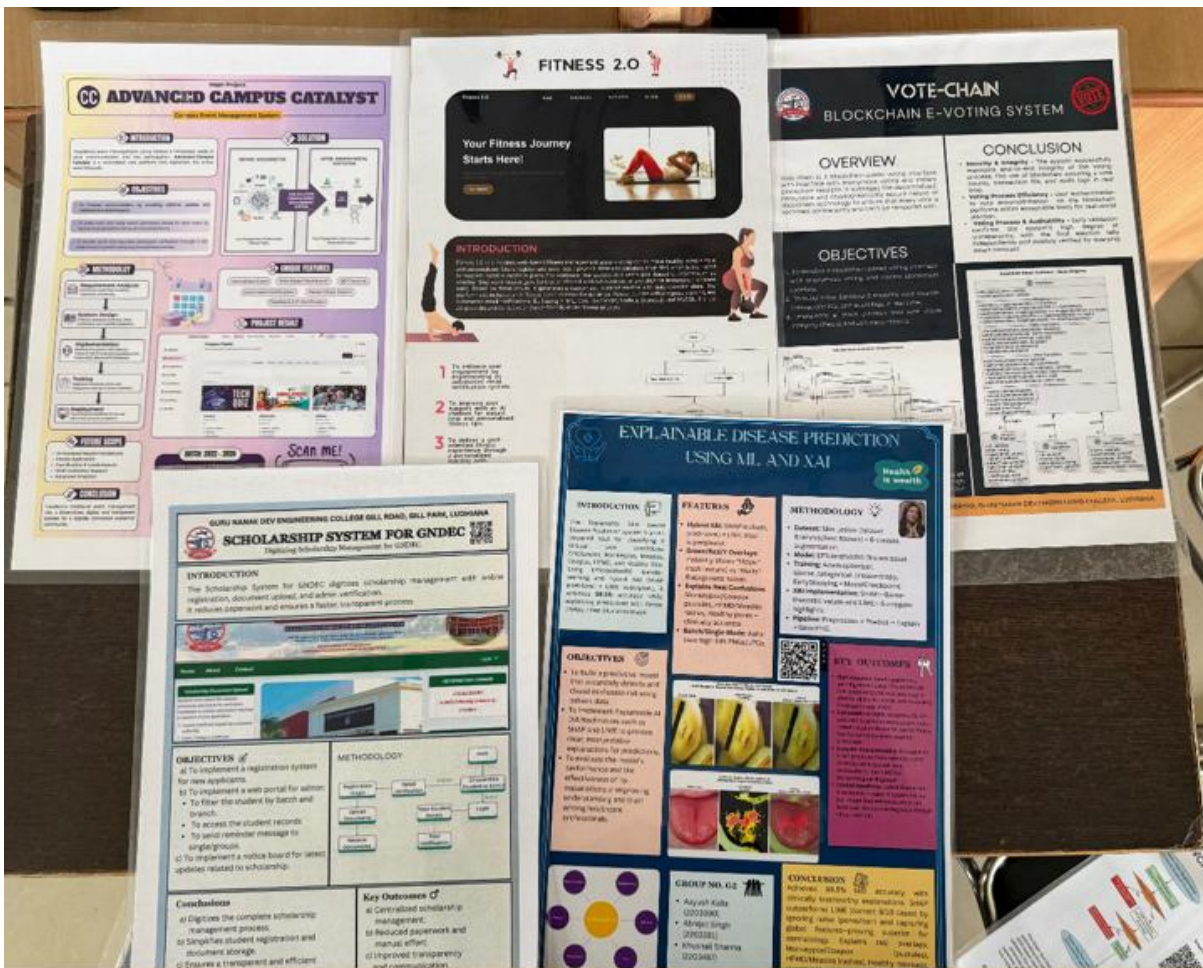
Ludhiana, Punjab, India

Ishar Singh Nagar, Ludhiana, Punjab 141006, India

Lat 30.860349, Long 75.860282

Friday, 19/12/2025 11:14 AM GMT+05:30

Note : Captured by GPS Map Camera



SMART BUS PASS WEBSITE

INTRODUCTION

The Smart Bus Pass Website is a digital solution designed to automate the process of bus pass registration, verification, and renewal. It allows users to apply online, upload ID proofs, and make secure payments through Razorpay (test mode). The system uses Tesseract OCR for automatic document verification and generates a unique QR-based digital bus pass for every approved user. Transport authorities can easily verify the pass by scanning the QR code, making the process fast, paperless, and efficient.

FLOWCHART

OUTCOME

OBJECTIVES

- To securely register users through OTP verification and OCR-based proof matching.
- To automate bus pass generation and renewal (daily/weekly/monthly) with secure online payments.
- To provide approved users with digital QR code passes, while giving rejected applications clear reasons for rejection.

CONCLUSION

The Smart Bus Pass System offers a secure and efficient digital solution for automating bus pass issuance and renewal. By integrating online registration, OCR-based identity verification, secure digital payments, and QR code-based validation, the system reduces manual effort, paperwork, and processing time. It enhances passenger convenience, improves transparency, and supports a paperless, eco-friendly public transport ecosystem. This project demonstrates how modern web technologies can be effectively applied to build scalable and smart transportation solutions.

G 17 : Jasmine Kaur(2203471), Komal Heer(2203491)

Under the guidance of : Dr. Preet Kamal Singh / Er. Kuljit Kaur

EXPLAINABLE DISEASE PREDICTION USING ML AND XAI

INTRODUCTION

The Explainable Skin Lesion Disease Prediction system is an AI-powered tool for classifying & critical skin conditions: Chloasma, Melasma, Erythema, Psoriasis, Vitiligo, and Healthy Skin. Using EfficientNetB0 transfer learning and Hybrid XAI (SHapley, LIME) global feature-highlighting, it achieves **89.3%** accuracy while explaining predictions with Green/Red/Blue overlays.

FEATURES

- Hybrid XAI: SHapley + LIME**: Combines global (SHapley) and local (LIME) explanations for model transparency.
- Green/Red/Blue Overlay**: Instantly shows "High/Low" risk areas on the skin image, highlighting critical features.
- Explains Real Confusions**: Monkeys/Peppers/Cheese/Plants, Healthy/Skin - Clinically accurate.
- Batch/Single Mode**: Auto-save high-Quality PNG/JPGs.

METHODOLOGY

- Dataset**: Skin Lesion Dataset (train/test split) - 8 classes, augmentation.
- Model**: EfficientNetB0 (Pre-trained).
- Training**: Adam optimizer, sparse categorical crossentropy, EarlyStopping + ModelCheckpoint.
- XAI Implementation**: SHapley - Game-theoretic values and LIME - Surrogate highlights.
- Pipeline**: Preprocesses → Predicts → Explain → Save PNGs.

OBJECTIVES

- To build a predictive model that accurately detects and classifies disease risk using patient data.
- To implement Explainable AI (XAI) techniques such as SHapley and LIME to provide clear, interpretable explanations for predictions.
- To evaluate the model's performance and the effectiveness of its explanations in improving understanding and trust among healthcare professionals.

KEY OUTCOMES

- High Accuracy: Achieved a state-of-the-art accuracy of 89.3% using EfficientNetB0, outperforming baseline models like Logistic Regression and SVM.
- Explainable AI: SHapley and LIME provide transparent, easy-to-understand explanations for model predictions, highlighting critical features.
- Global Feature Importance: SHapley provides global feature importance, highlighting critical features like "Red" and "Blue" areas.
- Local Feature Importance: LIME provides local feature importance, highlighting critical features like "High/Low" risk areas.
- Model Interpretability: The system provides clear, interpretable explanations for predictions, highlighting critical features.
- Model Performance: The system achieves a high accuracy of 89.3% using EfficientNetB0, outperforming baseline models.

CONCLUSION

Achieved **89.3%** accuracy with clinically trustworthy explanations. SHapley outperforms LIME (correct 8/10 cases) by ignoring noise (peppers) and capturing global features - proving superior for dermatology. Explains real confusions: Monkeys/Peppers (toxicology), Healthy/Skin (vitamin), Healthy/Skin (vitamin). Hybrid XAI builds doctor confidence.

GROUP NO. G2

Aayush Kalia (2203390), Abhyoj Singh (2203391), Khushi Sharma (2203487)



Group Holding First Position



Group Holding Second Position



Group Holding Third Position