Project Report Format

1. **INTRODUCTION:**

1.1 Project Overview:

HematoVision is a web-based deep learning application that classifies blood cell images into four categories: eosinophil, lymphocyte, monocyte, and neutrophil using MobileNetV2.

1.2 Purpose:

The project aims to assist early diagnostics by providing an accurate and fast blood cell classification tool accessible via a user-friendly web interface.

2. **IDEATION PHASE:**

2.1 **Problem Statement:**

Manual blood cell identification is time-consuming and error-prone, requiring automation to improve efficiency and accuracy.

2.2 **Empathy Map Canvas:**

Target users are medical technicians and students who need a reliable and intuitive tool to identify blood cell types without deep technical knowledge.

2.3 **Brainstorming:**

Multiple approaches were evaluated—traditional ML vs. deep learning. Transfer learning using MobileNetV2 was chosen for speed and accuracy.

3. **REQUIREMENT ANALYSIS**

3.1 Customer Journey Map:

User uploads an image → image gets classified → result is displayed with visual feedback.

3.2 Solution Requirement:

Python, TensorFlow/Keras, OpenCV, Flask, and a labeled blood cell dataset.

3.3 Data Flow Diagram:

Image Input → Preprocessing → Model Prediction → Output Class Display

3.4 Technology Stack:

- **Frontend:**HTML,CSS
- **Backend:**PYTHON+FLASK
- **Model:**KERUS+MOBILENETV2
- **Image Processing:**OPEN CV

4. PROJECT DESIGN:

4.1 Problem Solution Fit:

The tool effectively automates a manual diagnostic process, enhancing speed and reducing human error.

4.2 Proposed Solution:

A Flask app integrated with a pre-trained MobileNetV2 model for real-time classification.

4.3 Solution Architecture:

User Interface → Image Preprocessor → Classifier (MobileNetV2) → Result Renderer

5. PROJECT PLANNING & SCHEDULING:

5.1 Project Planning:

The project followed a linear phase model: problem identification → model training → integration → UI development → testing.

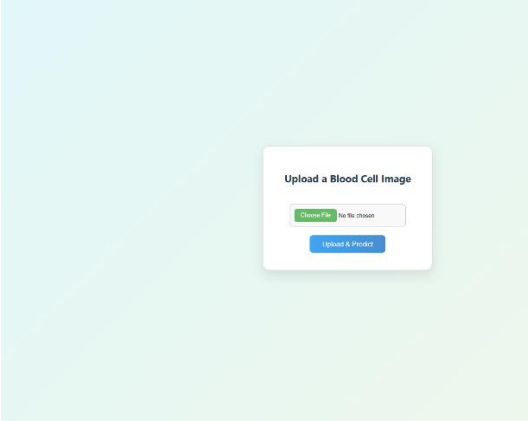
6. FUNCTIONAL AND PERFORMANCE TESTING:

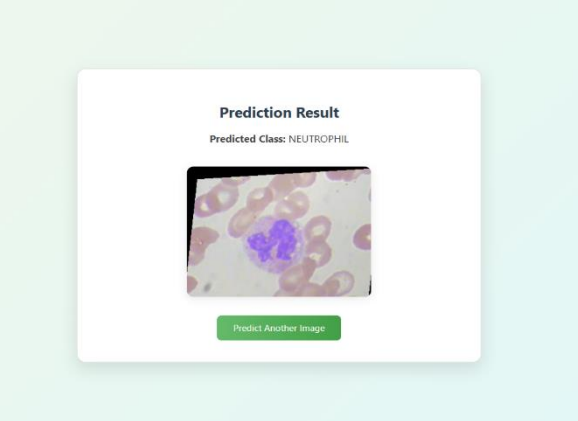
6.1 Performance Testing:

Tested using various image types. The model gave high accuracy (>90%) with low inference time due to MobileNetV2 efficiency.

7. RESULTS:

7.1 Output Screenshots:





8. ADVANTAGES & DISADVANTAGES:

Advantages:

Fast and accurate predictions

Easy to use

Lightweight model suitable for web deployment

Disadvantages:

Limited to 4 blood cell types

Accuracy depends on image quality

9. CONCLUSION:

HematoVision demonstrates how deep learning and Flask can work together to provide an accessible, real-time medical diagnostic tool.

10. FUTURE SCOPE:

- Add more blood cell types
- Deploy on cloud or mobile
- Include prediction confidence and batch processing
- Generate reports for medical professionals

11. APPENDIX

Dataset Link:

https://www.kaggle.com/d

atasets/paultimothymoone

y/blood-cells

GitHub & Project Demo Link:

- **Github link:** https://github.com/RongalaPravalika/Hematovision
- **Project demo link:** https://drive.google.com/file/d/1fm-U_yhKdk9TwT8hzplfy4dX-T7ysyFM/view?usp=drivesdk