Project Prerequisites for HematoVision

Technical Prerequisites

Area Requirements

Programming

Language

Python 3.7+

Libraries/Frameworks TensorFlow or PyTorch, NumPy, Pandas, Matplotlib, Scikit-learn

Image Processing OpenCV, PIL

Environment Jupyter Notebook / Google Colab / VS Code

GPU support (local or via cloud like Google Colab, Kaggle, AWS, etc.)

for faster model training

Knowledge Prerequisites

Area Understanding Needed

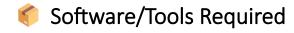
Python Programming Functions, classes, file I/O, libraries

Deep Learning Basics CNNs, activation functions, loss functions, backpropagation

Transfer Learning Fine-tuning pre-trained models like ResNet, EfficientNet, etc.

Image Classification Preprocessing, data augmentation, evaluation metrics

Model Evaluation Accuracy, Precision, Recall, F1-score, Confusion Matrix



Tool	Purpose
Anaconda / Python Environment	Managing Python packages
Jupyter Notebook / Colab	Interactive coding and visualization
TensorBoard / Matplotlib / Seaborn	Visualizing training and evaluation metrics
Git	Version control
Google Colab / Kaggle / Local GPU	Training large models with better hardware

Dataset Requirements

- Images of blood cells, properly annotated by type (eosinophil, lymphocyte, monocyte, neutrophil).
- Dataset format: Should be organized into folders or labelled CSV file.
- dataset/

├— eosinophils/

├— lymphocytes/

— monocytes/

└─ neutrophils/