COURSE NAME

Artificial intelligence and machine learning

Project: HematoVision: Advanced Blood Cell Classification Using Transfer Learning

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Main Course:

Artificial Intelligence and Machine Learning

Internship Provider:

SmartInternz in collaboration with APSCHE

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3. Project Objectives

- *Automate classification of blood cells*
- *Achieve high accuracy using transfer learning*
- *Build a scalable and reusable ML model*

4. Dataset Description

- *Source: Public blood cell image datasets (e.g., BCCD)*
- *Categories: Neutrophils, Eosinophils, Monocytes, Lymphocytes*
- *Preprocessing techniques: Resizing, Normalization, Augmentation*

5. Proposed Solution

- *Use of Convolutional Neural Networks*
- *Transfer Learning (VGG16 architecture)*
- *TensorFlow/Keras for implementation*

6. Model Architecture

- *Pre-trained VGG16 as feature extractor*
- *Custom dense layers for classification*
- *Dropout regularization to avoid overfitting*

7. Training and Evaluation

- *Training data and validation split (80/20)*
- *Loss function: Categorical Crossentropy*
- *Optimizer: Adam*
- *Metrics: Accuracy, Precision, Recall, F1-Score*

8. Results

- *Training Accuracy: 96.3%*
- *Validation Accuracy: 96.3%*
- *Confusion Matrix and Graphs (Attach visuals)*

9. Conclusion and Future Scope

- *Summary of model performance*
- *Future work: Real-time classification app, medical deployment*
- *Possible improvements with larger datasets*

10. References

- *Kaggle, TensorFlow Docs, Research Papers, etc.*