



MAJOR PROJECT

Submitted By: Vigyat Singh (22051213)

7th Semester

In Partial Fulfilment of the Requirement for the Award of Bachelor's Degree

In **Computer Science and Engineering** under the guidance of

Gananatha Bhuyan

School of Computer Science and Engineering

KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY

BHUBANESWAR, ODISHA - 751024

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Pratik Singh - 22052038

Responsibilities:

- Led literature review for CNNs, hybrid models, and domain-adaptive techniques.
- Wrote Introduction & Related Work, framed research gap.
- Collected, cleaned datasets (RSI-CB256, EuroSAT, MSTAR, Brackish).
- Created dataset splits & summary stats.
- Implemented baseline models (VGG16, InceptionV3, EfficientNet, ResNet101, CNN+SVM).
- Prepared model comparison metrics (Table I).
- Wrote Datasets, Implementation Details & Discussion sections.

Tools Used:

- Python (PyTorch, Pandas)
- Kaggle + preprocessing tools
- Jupyter/Colab
- Excel/Sheets
- LaTeX/Word

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Responsibilities:

- Designed the Hybrid & Adaptive Deep Learning Framework (HADLF).
- Implemented adaptive 1D/2D conv, DenseNet-121 feature extractor, and SVM classifier.
- Wrote mathematical formulations (ReLU, metrics).
- Generated accuracy/loss curves and confusion matrix.
- Conducted all HADLF experiments across multiple domains.
- Wrote Experiments, Results, and Discussion sections.
- Final document formatting and integration.

Tools Used:

- Python (PyTorch, NumPy, scikit-learn)
- DenseNet-121 (torchvision)
- CUDA/GPU
- Matplotlib/Seaborn
- LaTeX/Word