

## 1. Project Title

Meme Template Classification Using Transfer Learning (MobileNetV2)

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## 2. Background & Motivation

In the community and the crypto market, memes serve as powerful narrative tools. They propagate faster than text on platforms such as Twitter (X) and play an essential role in shaping market sentiment, conveying opinions, and building cultural consensus.

For building an information operation (InfoOps) pipeline

, it is highly useful to automatically identify which meme template appears in an image.

This project aims to design a lightweight yet effective image classifier that recognizes popular meme templates such as Pepe, Wojak, Doge, Chad, NPC, Bullish/ Bearish memes, etc.

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## 3. Research Topic

Task Definition:

Given a meme image, classify it into one of several predefined meme template categories.

Target Classes include:

- Pepe
  - Wojak
  - Doge
  - NPC
  - Chad
  - Bullish Meme
  - Bearish Meme
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## 4. Dataset Preparation

Sources:

- Kaggle meme datasets
- Huggingface (Pepe/Wojak datasets)
- Twitter (X) collected images
- Google Images scraping

Dataset Size:

- Number of classes: 6–8
- 50–100 images per class
- Total images: 300–800

Preprocessing:

- Resize to 224×224
- Normalization
- Data Augmentation:
  - Random rotation
  - ColorJitter
  - Random crop
  - Horizontal flip

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## 5. Models & Methods

Model: MobileNetV2 (Pretrained on ImageNet)

Reasons for choosing MobileNetV2:

- Lightweight
- Fast to train
- Very effective on small datasets
- Easy to explain in PPT

Training strategy:

- Freeze early layers
- Fine-tune the classifier head

Training parameters:

- Loss: Cross-Entropy
  - Optimizer: Adam
  - Batch size: 32
  - Epochs: 10–20
  - LR: 1e-4
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## 6. Experiment Design

Data split:

- Train: 80%
- Validation: 20%

Pipeline:

1. Data collection
  2. Preprocessing & augmentation
  3. Transfer Learning with MobileNetV2
  4. Train/Validation
  5. Metrics evaluation
  6. Visualization (prediction samples, confusion matrix)
  7. Error case analysis
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## 7. Expected Outcomes

Performance:

- Expected accuracy: 85%–95%
- F1-score
- Confusion matrix

Visualization:

- Correct vs. misclassified examples
  - Confusion matrix (highlighting difficult pairs)
  - t-SNE feature embeddings
  - Accuracy/Loss curves
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## 8. Project Value

Beyond being an image classification practice, the project has meaningful real-world applications:

- Automatic classification of social media content

- Monitoring meme-driven sentiment in crypto markets
  - Supporting InfoOps or agentic fund pipelines
  - Understanding narrative propagation
  - Structuring visual cultural data
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## 9. Summary

This project builds a simple but effective meme template classifier using transfer learning. With small datasets enhanced by augmentation and a lightweight pretrained model, the system can achieve high accuracy and meaningful visualization. The results can be extended to real-world applications in crypto sentiment analysis and narrative monitoring.

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