

# Meow AI: Execution Master Plan

Vision-LLM for Compound Facial Emotion Recognition

<https://github.com/diya-thabet/Meow-AI.git>

## The Meow AI Team

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### Strategy for the Defense (Soutenance)

To ensure a successful defense, this plan is designed so that **every team member touches every part of the project**. While each member has a "Lead Role," all members must participate in code reviews, testing, and theory discussions for every phase.

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## 1 PROJECT OVERVIEW

**Goal:** Build an AI system that recognizes complex human emotions (like "Happily Surprised") using Vision-Language Models (Vision-LLMs).

**Deadline:** First week of January 2026 (Approx. 6 Weeks).

**Core Logic:**

1. **Input:** Image of a face.
2. **Processing:** Vision-LLM (BLIP-2 / LLaVA).
3. **Output:** Classification (Label) + Explanation (Text).

## 2 TEAM ROLES: LEAD & SUPPORT

*Policy: The "Lead" writes the core code. The "Support" reviews it, tests it, and learns the theory.*

### Dhia Eddine Thabet

**Lead:** Architecture, Docker, Streamlit.  
**Support:** Helps Ala with Dataset scripts; Reviews Mohamed's Model code.  
**Defense Focus:** "How do we deploy this?"

### Ala Eddine Madani

**Lead:** Data Engineering, Baselines.  
**Support:** Tests Dhia's Docker container; Validates Aymen's metrics.  
**Defense Focus:** "Is the data reliable?"

### Mohamed Ben Madhi

**Lead:** Vision-LLM, Fine-tuning.  
**Support:** Explains LLM theory to the team; Helps Aymen with XAI.  
**Defense Focus:** "How does the model think?"

### Aymen Satouri

**Lead:** Evaluation, XAI, Reporting.  
**Support:** Reviews Data quality (Ala); Tests App usability (Dhia).  
**Defense Focus:** "Is the model accurate?"

## 3 TOOLS & ENVIRONMENT (\$0 COST)

Category	Tool Selected
Compute (GPU)	Kaggle Kernels (2x T4 GPU, 30hrs/week) or Colab.
Repo	GitHub ( <a href="https://github.com/diya-thabet/Meow-AI.git">https://github.com/diya-thabet/Meow-AI.git</a> ).
Models	Hugging Face (Transformers, PEFT).
App UI	Streamlit (Python framework).
Container	Docker (Desktop version).

## 4 WEEKLY EXECUTION PLAN

### Week 1: Foundations (Nov 27 – Dec 3)

**Focus:** Environment Setup & Data Securing.

- **Dhia (Lead):** Initialize GitHub Repo structure.
- **Ala (Lead):** Secure Data (RAF-CE or RAF-DB). Write resizing scripts.
- **Mohamed:** Run a "Hello World" BLIP-2 inference on Colab. *Share screen with team.*
- **Aymen:** Define the evaluation metrics list.
- **Team Sync:** Everyone pulls the Repo and runs the "Hello World" script to ensure their laptops work.

### Week 2: The Baseline (Dec 4 – Dec 10)

**Focus:** Standard Vision Model (ResNet/ViT).

- **Ala (Lead):** Train ResNet50 on the emotion data.
- **Dhia:** Help set up the Kaggle training pipeline.
- **Aymen:** Calculate the baseline accuracy.
- **Mohamed:** Prepare the text prompts for the LLM phase.
- **Team Sync:** Code Review of Ala's training script. Everyone must understand how the data is loaded.

### Week 3: The Brain - Vision-LLM (Dec 11 – Dec 17)

**Focus:** Fine-Tuning the LLM (The most complex part).

- **Mohamed (Lead):** Implement LoRA Fine-tuning for BLIP-2/Qwen-VL.
- **Dhia & Ala:** Debugging session. Handle "Out of Memory" errors together.
- **Aymen:** Draft the "Methodology" chapter for the report.
- **Team Sync:** Mohamed explains "LoRA" and "Attention Mechanisms" to the group for the defense.

## Week 4: Interpretability & Interface (Dec 18 – Dec 24)

**Focus:** Making it Visual (XAI + App).

- **Aymen (Lead):** Implement Grad-CAM (Heatmaps).
- **Dhia (Lead):** Build the Streamlit Web App (Upload Image → Show Result).
- **Mohamed:** Improve Text Generation quality (Prompt Engineering).
- **Ala:** Data Augmentation to fix any weak classes.
- **Team Sync:** Everyone tests the App locally. Report bugs to Dhia.

### Week 5: Integration & Analysis (Dec 25 – Dec 31)

**Focus:** Connecting Dots & Scientific Analysis.

- **Dhia (Lead):** Final Dockerization. Ensure 'docker-compose up' works on all 4 laptops.
- **Aymen (Lead):** Compare Baseline (Week 2) vs Vision-LLM (Week 4).
- **Mohamed & Ala:** Analyze failure cases. Why did the AI mistake "Sad" for "Angry"?
- **Team Sync:** Mock Defense. Each person explains a random part of the code.

### Week 6: Final Polish (Jan 1 – Jan 7)

**Focus:** Documentation & Presentation.

- **All Team:** Finalize the PDF Report (Scientific Paper style).
- **Dhia:** Verify 'README.md' is clear for the evaluators.
- **Mohamed:** Record a Demo Video.
- **Delivery:** Submit Code + Docker + Report.

## 5 RISK MANAGEMENT (PLAN B)

- **Risk:** RAF-CE Password delay.

**Solution:** Use **RAF-DB Basic**. We manually mix classes (Data Augmentation) to simulate "Compound Emotions" for the prototype.

- **Risk:** GPU Memory OOM.

**Solution:** Use **4-bit Quantization** and **Gradient Checkpointing**.

- **Risk:** Docker issues on Windows vs Linux.

**Solution:** We prioritize the **Colab Demo** for the presentation if Docker fails during the live demo.

## 6 DELIVERABLES CHECKLIST

- Source Code (GitHub)
- Model Weights (Hugging Face)
- Docker Image
- Final Report
- Presentation Slides