Food Recipe Generator - Project Overview

Project Overview

PROJECT: Universal Food Recipe Generator
DATE: January 18-20, 2026
AUTHOR: Capstone Project

OBJECTIVE:
Build a deep learning model that can recognize food images from both
Indian and Western cuisines and provide recipes.

FINAL RESULTS:
- Total Categories: 181 (80 Indian + 101 Western)
- Training Images: 113,900
- Validation Accuracy: 84.8%
- Overfitting Gap: +2.5% (Excellent generalization)

TECHNOLOGIES USED:
- PyTorch 2.6.0 with CUDA 12.4
- EfficientNet-B0 (Transfer Learning)
- Gradio (Web Interface)
- Python 3.x

HARDWARE:
- GPU: NVIDIA RTX 3050 Laptop (4GB VRAM)
- Training Time: ~8.5 hours for final model

Model Evolution

MODEL TRAINING EVOLUTION:

Version 1 (V1) - Initial Attempt
- Dataset: 90 classes, 3,150 images
- Accuracy: 65.5%
- Gap: +32% (Severe Overfitting)
- Problem: Too little data, model memorized training set

Version 2 (V2) - Heavy Regularization
- Dataset: Same as V1
- Accuracy: 45.6%
- Gap: -13% (Underfitting)
- Problem: Too much regularization, model couldn't learn

Version 3 (V3) - Balanced Approach
- Dataset: Same as V1
- Accuracy: 63.6%

- Gap: +15.5% (Slight Overfitting)
- Better but still not optimal

FINAL MODEL - Large Dataset
- Dataset: 181 classes, 113,900 images
- Accuracy: 84.8%
- Gap: +2.5% (Perfect!)
- Solution: More data solved the overfitting problem