NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2025-2026

Batch Number	BB-3
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Guide	A.Ramesh M. Tech
Title	**EfficientNetV2-Driven Smart Grading and Classification Framework for Agricultural Fruits**
Domain/Technology	DEEP LEARNING
Base Paper Link	https://ieeexplore.ieee.org/document/10475330
Dataset Link	https://www.kaggle.com/datasets/shashwatwork/fruitnet-indian-fruits-dataset-with-quality
Software Requirements	Browser: Any latest browser like Chrome Operating System: Windows 7 Server or later Python (COLAB)
Hardware Requirements	SystemType: Intel Core i5 or above RAM: 8 GB Number of cores:5 Number of Threads: 4
Abstract	This study introduces a dual-model approach using **EfficientNetV2** for the **simultaneous classification and grading of six fruits** (banana, apple, orange, pomegranate, lime, and guava) from the FruitNet dataset. It uses **same-domain transfer learning**, where the classification model's knowledge is transferred to a grading model. To handle class imbalance and improve generalization, it combines **AugMix, CutMix, and MixUp** techniques. The approach achieves **99% accuracy**, showing strong potential for enhancing **agricultural automation** through computer vision. The code is available on GitHub under the name **MFCG**.

Signature of the student(s) **Signature of the Guide** **Signature of the project coordinator**