# LIGHTWEIGHT DEEP LEARNING FOR GRAIN QUALITY ASSESSMENT: APPLYING MOBILENET ON THE GRAINSET DATASET

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**Abstract -** Grain quality assessment plays animportant role in ensuring food security and supporting efficient supply chain management. Traditional manual inspection methods are labor-intensive, time-consuming, and prone to subjectivity, highlighting the need for automated and scalable solutions. Recent advances in lightweight deep learning models have enabled efficient deployment on resource-constrained devices. In this study, we explore the application of MobileNet V3 large on the GrainSet dataset, which contains 200000 images of wheat grains captured under varying conditions. MobileNet V3 large is selected for its balance between accuracy and computational efficiency, making it suitable for real-time grain classification tasks. Experimental results demonstrate that the model achieves competitive accuracy in distinguishing grain classes while significantly reducing model size and inference time compared to conventional deep CNNs. These findings indicate that MobileNet V3 Large offers a promising solution for integrating AI-based grain quality monitoring into edge devices, enabling real-time decision support in agricultural environments.

**Keywords** - MobileNet V3 Large, Wheat Grain Assessment, Grainset Dataset.