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Dietary Intake Monitoring System Based on Food Image Recognition

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Abstract: *The accurate recognition and nutritional assessment of food items have become crucial in addressing dietary management and health monitoring. While deep learning-based food image recognition has advanced significantly, existing models often fail to generalize across diverse cuisines, particularly Indian dishes with complex presentations. The lack of culturally inclusive datasets further limits the performance of these models. This study evaluates YOLOv8 for food recognition, highlighting its strengths and challenges when applied to Indian cuisine. Data augmentation, Synthetic Data Generation, and 3D reconstruction techniques were explored. The findings indicate that integrating stereo vision and depth estimation can significantly enhance volume measurement accuracy. This paper provides a comprehensive review of food image recognition methodologies focused primarily on Indian Cuisines and suggests improvements for real-world applications.*

Keywords: YOLOv8, computer vision, food recognition, nutrition, dietary assessment system, data augmentation, synthetic data generation, 3D reconstruction, artificial intelligence