***literature review for Coffee bean Classification***

| **Paper Title** | **Author** | **Year** | **Dataset** | **Model** | **Total data** | **categorize** | **Overall accuracy** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| CNN-HOG Based Hybrid Feature Mining for Classification of Coffee Bean Varieties Using Image Processing | Yirga Kene Molla | 2024 | Ethiopian Coffee Beans | Hybrid CNN-HOG feature extraction with SVM (RBF Kernel) | 450 images (3 categories: Arabica, Robusta, Liberica) | Coffee Bean Varieties | CNN-HOG: 97.5%, CNN: 85.83%, HOG: 74.17% |
| Coffee Beans Classification Using Convolutional Neural Networks Based on Extraction Value Analysis in Grayscale Color Space | Bagus Raffi Santoso | 2025 | Grayscale Coffee Bean Dataset | 900 images | 900 images(three classes: Arabica, Liberica, and Robusta) | Coffee Bean Classification | 85% |
| Optimization of Coffee Bean Maturity Classification by Segmentation on Multispectral Images Using HSV and DBSCAN | MN Hidayat | 2025 | Multispectral Coffee Bean Images | HSV + DBSCAN for segmentation, supervised classifiers | multispectral image data, | | Coffee Bean Maturity Classification | | --- | | 92.4% |
| Classification of Saudi Coffee Beans Using a Mobile Application Leveraging Squeeze Vision Transformer Technology | Haifa F. Alhasson | 2025 | Saudi Coffee Beans | Vision Transformer (SqueezeViT) for mobile devices | 5 Saudi coffee bean types: Harari, Khawlani, Nabari, Laqamti, and Bariah (Wild).  4 roast levels: Raw, Degree 1, Degree 2, and Degree 3. | | Coffee Bean Varieties | | --- | | | 90.1% | | --- | |
| Peaberry and Normal Coffee Bean Classification Using CNN, SVM, and KNN: Their Implementation and Limitations on Raspberry Pi 3 | Hira Lal Gope | 2022 | Peaberry and Normal Coffee Bean Dataset | CNN, SVM, KNN classifiers with deployment on Raspberry Pi | | 1200 images | | --- | | Peaberry vs Normal Beans | CNN: 94.5%, SVM: 92%, KNN: 85% |
| Enhancing Coffee Bean Classification: A Comparative Analysis of Pre-Trained Deep Learning Models | Esraa Hassan | 2024 | Roasted Coffee Beans Dataset | Transfer learning with pre-trained models (ResNet, DenseNet, EfficientNet) | 4800 images | Roasted Coffee Bean Classification | EfficientNet: 95%, ResNet: 91% |
| Comparison of Deep Learning Models in Automatic Classification of Coffee Bean Species | Adem Korkmaz | 2025 | Coffee Bean Species Dataset | DenseNet201, InceptionV3, Xception, EfficientNet-B0 | 1554 images | Coffee Bean Species Classification | EfficientNet-B0: 100% |
| Performance Evaluation of Coffee Bean Binary Classification Through Deep Learning Techniques | Fajrul Islamy | 2023 | Coffee Bean Defective vs Non-Defective Dataset | CNN-based binary classification | 8000 images | Defective vs Non-Defective Beans | 96% (F1-Score: 95%) |
| Classification of Shape Bean Coffee Using Convolutional Neural Network | Fikrul Ilmi R.H. Zer | 2023 | Shape-Based Coffee Beans Dataset | CNN | 1000 images | Coffee Bean Shape Classification (defect, longberry, peaberry, premium) | 90.6% |
| Prediction of Defect Coffee Beans Using CNN | J. Lee | 2022 | Green Coffee Bean Dataset | CNN | | 800 images | | --- | | Defective vs Normal Beans | | 93.7% | | --- | |
| BeanClassify: Convolutional Neural Networks for Coffee Bean Categorization | Bagus Raffi Santoso | 2025 | | Coffee Bean Categorization Dataset | | --- | | Custom CNN | 1500 images | Multi-Class Coffee Bean Classification | 97.8% |
| Application of Pre-Trained Deep Convolutional Neural Networks for Coffee Beans Species Detection | Yavuz Unal | 2022 | Coffee Bean Species Dataset | Transfer learning with VGG16, ResNet50 | | 2000 images | | --- | | Coffee Bean Species Detection | VGG16: 95%, ResNet50: 94% |