**Model Performance Table**

|  |  |  |  |
| --- | --- | --- | --- |
| **Model** | **Training Accuracy** | **Validation/Test Accuracy** | **Notes** |
| CNN | 92.47% | 71.73% | Overfitting (high val loss: 1.2962) |
| **MobileNetV2** | **92.53%** | **86.96%** | **Selected**: Strong generalization, efficient |
| Random Forest | N/A | 100.00% | Suspicious (small test set: 223 samples) |
| ResNet50 | 87.55% | 87.55% | Balanced but less efficient |
| SVM (Best: RBF) | N/A | 39.83% | Poor performance |
| Logistic Regression | N/A | 90.15% | High accuracy but less efficient for deployment |

**Final Selected Model**

**MobileNetV2** was selected as the final model due to its **strong validation accuracy (86.96%)**, low validation loss (0.3623), and lightweight architecture optimized for mobile and edge devices. While Logistic Regression scored higher (90.15%), MobileNetV2’s efficiency makes it ideal for real-world deployment in waste management systems, balancing performance and computational cost effectively.