# Image Classification for Detecting Diseases in Plants

An image classification model for real-world use cases is a deep learning system designed to automatically analyze and categorize digital images based on their visual content, enabling practical applications like identifying plant diseases from leaf photos or classifying objects in street scenes (e.g., vehicles, pedestrians, or signage). At its core, it leverages convolutional neural networks (CNNs) or advanced architectures like transfer learning from pre-trained models (e.g., ResNet or EfficientNet) to extract features such as shapes, textures, and colors from images. The model is trained on labeled datasets, where it learns to map input images to output classes (e.g., "healthy leaf" vs. "bacterial spot" for plant diseases). Once trained, it can process new, unseen images in real-time or batch mode, providing predictions with confidence scores. This technology addresses real-world challenges by automating manual inspections, improving accuracy in fields like agriculture (e.g., early disease detection to prevent crop loss), urban planning (e.g., traffic monitoring), or healthcare (e.g., medical image diagnosis), while incorporating best practices like data augmentation to handle variations in lighting or angles, and evaluation metrics to ensure robustness against biases or imbalances.