Model Development Phase Template

Date	19 july 2024
Team ID	SWTID1720084639
Project Title	Beneath the Waves: Unraveling Coral Mysteries through Deep Learning
Maximum Marks	5 Marks

Model Selection Report

For model selection, VGG16, ResNet, Inception, Xception, and DenseNet each offer unique advantages for image classification tasks. VGG16, with its 16-layer architecture and simple design, is effective for feature extraction. ResNet uses residual connections to overcome the vanishing gradient problem, providing scalability and high accuracy. Inception modules capture multi-scale features with parallel convolutions, offering efficient computation and robustness. Xception extends Inception by using depthwise separable convolutions, enhancing computational efficiency and accuracy. DenseNet promotes feature reuse and efficient gradient flow through dense connections, resulting in fewer parameters and improved performance. Each model excels in different aspects, making them suitable for various computer vision applications.

Model Selection Report:

Model	Description
VGG16	Deep CNN with 16 layers; excels in image classification, simple architecture, high accuracy, widely used in computer vision tasks. Uses 3x3 convolutional filters, effective for feature extraction, and max-pooling layers for down-sampling, aiding in robust performance on large datasets like ImageNet.
Resnet	Deep residual network with varying depths (e.g., ResNet-50, ResNet-101); excels in image classification, solves vanishing gradient problem using

	residual connections. High accuracy, scalable, widely used in computer vision tasks.
Inception	Deep CNN with modules that capture multi-scale features; excels in image classification, high accuracy, efficient computation. Uses 1x1, 3x3, and 5x5 convolutions in parallel, followed by max-pooling, allowing for diverse feature extraction, widely used in computer vision.
Xception	Deep CNN based on depthwise separable convolutions; excels in image classification, high accuracy, efficient computation. Extends the Inception architecture by replacing the standard Inception modules with depthwise separable convolutions, improving performance and computational efficiency, widely used in computer vision tasks.
Densenet	Deep CNN with dense connections; excels in image classification, high accuracy, mitigates vanishing gradient problem. Each layer receives input from all previous layers, promoting feature reuse and efficient gradient flow, resulting in fewer parameters and better performance, widely used in computer vision tasks.