Model Development Phase Template

Date	27 October 2024
Team ID	739755
Project Title	Bird Species Classification
Maximum Marks	5 Marks

Model Selection Report

In the model selection report for future deep learning and computer vision projects, various architectures, such as CNNs or RNNs, will be evaluated. Factors such as performance, complexity, and computational requirements will be considered to determine the most suitable model for the task at hand.

Model Selection Report:

Model	Description
CNN (Convolutional Neural Network)	A CNN is a specialized deep learning model designed for processing grid-like data, particularly images. Its architecture is composed of multiple layers that automatically and adaptively learn spatial hierarchies of features from input images. The core components of a CNN include: Convolutional Layers, which apply convolution operations using learnable filters to detect low- to high-level features; Pooling Layers, which reduce dimensionality and enhance feature robustness through techniques like max pooling and average pooling; Activation Functions (e.g., ReLU) that

introduce non-linearity; Fully Connected (Dense) Layers, which integrate the learned features for classification or regression tasks; and Dropout Layers, which mitigate overfitting by randomly disabling neurons during training. CNNs are highly effective in recognizing complex patterns, textures, and structures within images, making them ideal for image classification, object detection, segmentation, and other computer vision tasks. In the context of your bird species classification project, CNNs help in learning distinctive visual features of different bird species, leading to precise classification. CNNs also support transfer learning, allowing pre-trained models like VGG16, ResNet, or MobileNet to accelerate training and improve performance.