**Model Development Phase Template**

|  |  |
| --- | --- |
| Date | 02 October 2024 |
| Team ID | 740031 |
| Project Title | OptiInsight - Revolutionizing Ophthalmic Care With Deep Learning For Predictive Eye Disease Analysis |
| Maximum Marks | 5 Marks |

**Model Selection Report**

Major projects demonstrate strong proficiency in deep learning and its practical applications. Notable projects include *"Optiinsight: Revolutionizing Ophthalmic Care with Deep Learning for Predictive Eye Disease Analysis"* and *"Age and Gender Detection Using Deep Learning."* These initiatives showcase expertise in developing AI-driven solutions for healthcare and biometric advancements.

**Model Selection Report:**

|  |  |
| --- | --- |
| **Model** | **Description** |
| VGG19 | VGG19 is a deep convolutional neural network (CNN) architecture introduced by the Visual Geometry Group (VGG) at the University of Oxford. It was proposed in the 2014 paper *"Very Deep Convolutional Networks for Large-Scale Image Recognition"* by Simonyan and Zisserman. VGG19 is an extension of the VGG16 model, consisting of 19 layers, including 16 convolutional layers and 3 fully connected layers.  **Key Features of VGG19:**   1. **Small Convolutional Filters (3x3):**   All convolutional layers use 3x3 filters with a stride of 1 and padding to maintain spatial dimensions.  Small filters allow the network to capture fine details and spatial hierarchies.   1. **Deep Architecture:**   Comprising 19 layers, VGG19 is deeper than its predecessors, enabling the learning of more complex features.  The architecture follows a uniform design: convolutional layers are stacked in increasing depth, followed by max-pooling layers.   1. **ReLU Activation:**   Rectified Linear Units (ReLU) are applied after each convolutional layer to introduce non-linearity and accelerate convergence.   1. **Pooling Layers:**   2x2 max-pooling layers with a stride of 2 reduce spatial dimensions, ensuring computational efficiency.   1. **Fully Connected Layers:**   The network concludes with three fully connected layers, with the last layer using a softmax activation for classification.   1. **Weight Sharing:**   The model leverages pre-trained weights on large datasets like ImageNet, making it suitable for transfer learning. |