# Sport Celebrity Image Classification

## 1. MODEL

The model chosen is Convolutional Neural Network (CNN) implemented using TensorFlow and Keras. The model architecture consists of the following layers:

- Input Layer: Convolutional layer with 32 filters of size (3, 3) and ReLU activation.
- MaxPooling Layer: MaxPooling with a pool size of (2, 2) for downsampling.
- Flatten Layer: Flattens the output from the previous layers.
- Dense Layer 1: Fully connected layer with 256 neurons and ReLU activation.
- Dropout Layer: Dropout layer with a dropout rate of 0.5 for regularization.
- Dense Layer 2: Fully connected layer with 512 neurons and ReLU activation.
- Output Layer: Dense output layer with 5 neurons (equal to the number of classes) and softmax activation for multi-class classification.

The model is compiled with the Adam optimizer, sparse categorical crossentropy loss function, and accuracy as the evaluation metric.

## 2. TRAINING

Data Preprocessing:

- Images are loaded from different celebrity directories.
- Images are resized to (128, 128) pixels.

Train-Test Split:

- The dataset is split into training and testing sets (80% training, 20% testing).

Normalization:

- Pixel values are normalized to the range [0, 1]. Model Training:
- The model is trained for 50 epochs with a batch size of 128.
- Training includes validation split (10% of the training data) for monitoring overfitting.

## 3. FINDINGS

Accuracy:

- The model achieved an accuracy of approximately 82.35% on the validation set.
- The training and validation accuracy and loss were tracked over the epochs, showing how well the model was learning from the training data.

Classification report:

- Precision, recall, and F1-score were provided for each class, offering a detailed performance analysis for individual celebrity classes.
- The macro and weighted averages for precision, recall, and F1-score were also given, providing an overall assessment of the model's performance.

Model Prediction:

- The model was tested on a set of celebrity images, and predictions were made for each image.
- Predictions for specific celebrities (e.g., Maria Sharapova and Roger Federer) were provided, showing that the model is capable of making accurate predictions.