

## Report on the classification of images of celebrities

The dataset comprises images of five distinct celebrities: Lionel Messi, Maria Sharapova, Roger Federer, Serena Williams, and Virat Kohli, with varying quantities of images per person. Specifically, there are 36 images of Lionel Messi, 34 images of Maria Sharapova, 28 images of Roger Federer, 29 images of Serena Williams, and 41 images of Virat Kohli. The primary aim of this project was to develop a reliable model capable of accurately differentiating between these celebrity images.

The model chosen is **CNN**.

### ARCHITECTURE:

- Input Layer: Supports pictures with sizes of 128, 128, and 3.
- Convolutional Layer: Utilises a (3, 3) kernel with ReLU activation to incorporate 32 filters.
- Max Pooling Layer: Reduces the amount of space needed to extract features.
- Flatten Layer: Provides a vector representation of the 2D matrix data for additional processing.
- Dense Layers: ReLU activation is present in both fully connected layers, one of which has a 0.1 regularisation dropout. Softmax activation is used in the last layer for multi-class

The images in the dataset were resized to be all the same size (128x128 pixels) and their pixel values were adjusted for better training. The dataset was then split into two parts: 80% for training the model and 20% for validating its performance.

During training, the model used `sparse_categorical_crossentropy` loss function and adam optimizer. To prevent the model from overfitting, a technique called early stopping was used. This technique stopped the training if the model didn't improve for 10 consecutive rounds of learning. The model was trained over 25 epochs, utilising a batch size of 32 for each iteration.

During training, the model's accuracy progressively improved from an initial .24 to a peak of .97 on the training dataset. On the test data the accuracy achieved is 79.41%.