

```
Entrenamiento: Imágenes con tatuajes: 4596 sin: 3404 total imágenes de train: 8000
Validación: Imágenes con tatuajes: 1149 sin: 851 total imágenes de validate: 2000
Test: Imágenes con tatuajes: 1149 sin: 851 total imágenes de test: 2000
Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/mobilenet\_v2/mobilenet\_v2\_weights\_tf\_dim\_ordering\_tf\_kernels\_1.0\_224\_no\_top.h5
9412608/9406464 [=====] - 0s 0us/step
Arquitectura MobileNetv2-ft
Model: "sequential"
```

Layer (type)	Output Shape	Param #
=====		
mobilenetv2_1.00_224 (Model)	(None, 7, 7, 1280)	2257984
global_average_pooling2d (G1	(None, 1280)	0
dense (Dense)	(None, 320)	409920
dropout (Dropout)	(None, 320)	0
dense_1 (Dense)	(None, 320)	102720
dropout_1 (Dropout)	(None, 320)	0
dense_2 (Dense)	(None, 1)	321
=====		

```
Total params: 2,770,945
Trainable params: 2,736,833
Non-trainable params: 34,112
```

```
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: tf.Tensor(0.005, shape=(), dtype=float32)
lr nuevo: tf.Tensor(0.005, shape=(), dtype=float32)
Epoch 1/24
250/250 [=====] - 78s 310ms/step - loss: 0.2592 - accuracy: 0.8894 - val_loss: 0.4876 - val_accuracy: 0.8560
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: tf.Tensor(0.005, shape=(), dtype=float32)
lr nuevo: tf.Tensor(0.005, shape=(), dtype=float32)
Epoch 2/24
250/250 [=====] - 77s 308ms/step - loss: 0.1486 - accuracy: 0.9404 - val_loss: 0.4132 - val_accuracy: 0.8765
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004267766952966369
lr nuevo: tf.Tensor(0.004267767, shape=(), dtype=float32)
Epoch 3/24
250/250 [=====] - 77s 307ms/step - loss: 0.1065 - accuracy: 0.9615 - val_loss: 0.5573 - val_accuracy: 0.8515
lr actual: tf.Tensor(0.004267767, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.003456708580912725
lr nuevo: tf.Tensor(0.0034567085, shape=(), dtype=float32)
Epoch 4/24
250/250 [=====] - 77s 309ms/step - loss: 0.0945 - accuracy: 0.9668 - val_loss: 0.4631 - val_accuracy: 0.8620
lr actual: tf.Tensor(0.0034567085, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0025
lr nuevo: tf.Tensor(0.0025, shape=(), dtype=float32)
Epoch 5/24
```

```
250/250 [=====] - 76s 305ms/step - loss: 0.0716 - accuracy: 0.9758 - val_loss: 0.7781 - val_accuracy: 0.8255
lr actual: tf.Tensor(0.0025, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0015432914190872758
lr nuevo: tf.Tensor(0.0015432914, shape=(), dtype=float32)
Epoch 6/24
250/250 [=====] - 76s 306ms/step - loss: 0.0546 - accuracy: 0.9808 - val_loss: 0.3306 - val_accuracy: 0.9020
lr actual: tf.Tensor(0.0015432914, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0007322330470336313
lr nuevo: tf.Tensor(0.00073223305, shape=(), dtype=float32)
Epoch 7/24
250/250 [=====] - 76s 305ms/step - loss: 0.0394 - accuracy: 0.9870 - val_loss: 0.1596 - val_accuracy: 0.9475
lr actual: tf.Tensor(0.00073223305, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00019030116872178316
lr nuevo: tf.Tensor(0.00019030117, shape=(), dtype=float32)
Epoch 8/24
250/250 [=====] - ETA: 0s - loss: 0.0370 - accuracy: 0.9869>saved snapshot /content/drive/My Drive/MAIR-Master/08MAIR-TFM/modelos/ensemble/mobilenet2
250/250 [=====] - 79s 315ms/step - loss: 0.0370 - accuracy: 0.9869 - val_loss: 0.1322 - val_accuracy: 0.9535
lr actual: tf.Tensor(0.00019030117, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.005
lr nuevo: tf.Tensor(0.005, shape=(), dtype=float32)
Epoch 9/24
250/250 [=====] - 76s 303ms/step - loss: 0.0782 - accuracy: 0.9725 - val_loss: 0.2762 - val_accuracy: 0.9305
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004809698831278217
lr nuevo: tf.Tensor(0.004809699, shape=(), dtype=float32)
Epoch 10/24
250/250 [=====] - 76s 305ms/step - loss: 0.0778 - accuracy: 0.9709 - val_loss: 0.4486 - val_accuracy: 0.8725
lr actual: tf.Tensor(0.004809699, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004267766952966369
lr nuevo: tf.Tensor(0.004267767, shape=(), dtype=float32)
Epoch 11/24
250/250 [=====] - 76s 303ms/step - loss: 0.0704 - accuracy: 0.9760 - val_loss: 0.2533 - val_accuracy: 0.9280
lr actual: tf.Tensor(0.004267767, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.003456708580912725
lr nuevo: tf.Tensor(0.0034567085, shape=(), dtype=float32)
Epoch 12/24
250/250 [=====] - 76s 304ms/step - loss: 0.0563 - accuracy: 0.9809 - val_loss: 0.3876 - val_accuracy: 0.9060
lr actual: tf.Tensor(0.0034567085, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0025
lr nuevo: tf.Tensor(0.0025, shape=(), dtype=float32)
Epoch 13/24
250/250 [=====] - 76s 303ms/step - loss: 0.0462 - accuracy: 0.9846 - val_loss: 0.1659 - val_accuracy: 0.9480
lr actual: tf.Tensor(0.0025, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0015432914190872758
lr nuevo: tf.Tensor(0.0015432914, shape=(), dtype=float32)
Epoch 14/24
250/250 [=====] - 76s 305ms/step - loss: 0.0344 - accuracy: 0.9883 - val_loss: 0.1890 - val_accuracy: 0.9540
lr actual: tf.Tensor(0.0015432914, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0007322330470336313
lr nuevo: tf.Tensor(0.00073223305, shape=(), dtype=float32)
Epoch 15/24
250/250 [=====] - 77s 307ms/step - loss: 0.0265 - accuracy: 0.9909 - val_loss: 0.1439 - val_accuracy: 0.9620
lr actual: tf.Tensor(0.00073223305, shape=(), dtype=float32)
```

```
lr maximo: 0.005 propuesto: 0.00019030116872178316
lr nuevo: tf.Tensor(0.00019030117, shape=(), dtype=float32)
Epoch 16/24
250/250 [=====] - ETA: 0s - loss: 0.0220 - accuracy: 0.9925>saved snapshot /content/drive/My Drive/MAIR-Master/08MAIR-TFM/modelos/ensemble/mobilenet2
250/250 [=====] - 77s 307ms/step - loss: 0.0220 - accuracy: 0.9925 - val_loss: 0.1326 - val_accuracy: 0.9635
lr actual: tf.Tensor(0.00019030117, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.005
lr nuevo: tf.Tensor(0.005, shape=(), dtype=float32)
Epoch 17/24
250/250 [=====] - 76s 304ms/step - loss: 0.0644 - accuracy: 0.9760 - val_loss: 1.3575 - val_accuracy: 0.7065
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004809698831278217
lr nuevo: tf.Tensor(0.004809699, shape=(), dtype=float32)
Epoch 18/24
250/250 [=====] - 76s 304ms/step - loss: 0.0579 - accuracy: 0.9797 - val_loss: 0.3042 - val_accuracy: 0.9270
lr actual: tf.Tensor(0.004809699, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004267766952966369
lr nuevo: tf.Tensor(0.004267767, shape=(), dtype=float32)
Epoch 19/24
250/250 [=====] - 76s 302ms/step - loss: 0.0522 - accuracy: 0.9821 - val_loss: 0.2269 - val_accuracy: 0.9400
lr actual: tf.Tensor(0.004267767, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.003456708580912725
lr nuevo: tf.Tensor(0.0034567085, shape=(), dtype=float32)
Epoch 20/24
250/250 [=====] - 75s 302ms/step - loss: 0.0409 - accuracy: 0.9850 - val_loss: 0.2259 - val_accuracy: 0.9525
lr actual: tf.Tensor(0.0034567085, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0025
lr nuevo: tf.Tensor(0.0025, shape=(), dtype=float32)
Epoch 21/24
250/250 [=====] - 75s 302ms/step - loss: 0.0342 - accuracy: 0.9889 - val_loss: 0.1499 - val_accuracy: 0.9695
lr actual: tf.Tensor(0.0025, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0015432914190872758
lr nuevo: tf.Tensor(0.0015432914, shape=(), dtype=float32)
Epoch 22/24
250/250 [=====] - 75s 302ms/step - loss: 0.0211 - accuracy: 0.9935 - val_loss: 0.1426 - val_accuracy: 0.9660
lr actual: tf.Tensor(0.0015432914, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0007322330470336313
lr nuevo: tf.Tensor(0.00073223305, shape=(), dtype=float32)
Epoch 23/24
250/250 [=====] - 76s 304ms/step - loss: 0.0218 - accuracy: 0.9934 - val_loss: 0.1258 - val_accuracy: 0.9650
lr actual: tf.Tensor(0.00073223305, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00019030116872178316
lr nuevo: tf.Tensor(0.00019030117, shape=(), dtype=float32)
Epoch 24/24
250/250 [=====] - ETA: 0s - loss: 0.0149 - accuracy: 0.9954>saved snapshot /content/drive/My Drive/MAIR-Master/08MAIR-TFM/modelos/ensemble/mobilenet2
250/250 [=====] - 76s 304ms/step - loss: 0.0149 - accuracy: 0.9954 - val_loss: 0.1256 - val_accuracy: 0.9685
Train: 0.999, Test: 0.969
```

