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Imagenes entrenamiento originales: 11074
Imagenes entrenamiento con augmentation: 11074
Entrenamiento: Imágenes con tatuajes: 5740   sin: 5334   total imágenes de train: 11074
Validación: Imágenes con tatuajes:   1451   sin: 1076   total imágenes de validate: 2527
Arquitectura MobileNetv2-ft
Model: "sequential"
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Layer (type)	Output Shape	Param #
=====		
mobilenetv2_1.00_224 (Model)	(None, 7, 7, 1280)	2257984

global_average_pooling2d (Gl	(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		

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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 1/45
346/346 [=====] - 107s 308ms/step - loss: 0.2316 - accuracy: 0.9008 - val_loss: 0.5105 - val_accuracy: 0.8793 - lr: 0.0050
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 2/45
346/346 [=====] - 106s 307ms/step - loss: 0.1615 - accuracy: 0.9374 - val_loss: 0.6103 - val_accuracy: 0.8643 - lr: 0.0050
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004415111107797445
lr nuevo: tf.Tensor(0.004415111, shape=(), dtype=float32)
Epoch 3/45
346/346 [=====] - 106s 307ms/step - loss: 0.1164 - accuracy: 0.9564 - val_loss: 0.2777 - val_accuracy: 0.9307 - lr: 0.0044
lr actual: tf.Tensor(0.004415111, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00375
lr nuevo: tf.Tensor(0.00375, shape=(), dtype=float32)
Epoch 4/45
346/346 [=====] - 106s 306ms/step - loss: 0.0960 - accuracy: 0.9641 - val_loss: 0.1236 - val_accuracy: 0.9632 - lr: 0.0037
lr actual: tf.Tensor(0.00375, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0029341204441673263
lr nuevo: tf.Tensor(0.0029341204, shape=(), dtype=float32)
Epoch 5/45
346/346 [=====] - 106s 306ms/step - loss: 0.0740 - accuracy: 0.9729 - val_loss: 0.0739 - val_accuracy: 0.9719 - lr: 0.0029
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lr actual: tf.Tensor(0.0029341204, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0020658795558326742
lr nuevo: tf.Tensor(0.0020658795, shape=(), dtype=float32)
Epoch 6/45
346/346 [=====] - 106s 306ms/step - loss: 0.0583 - accuracy: 0.9795 - val_loss: 0.0572 - val_accuracy: 0.9814 - lr: 0.0021
lr actual: tf.Tensor(0.0020658795, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0012500000000000007
lr nuevo: tf.Tensor(0.00125, shape=(), dtype=float32)
Epoch 7/45
346/346 [=====] - 106s 306ms/step - loss: 0.0678 - accuracy: 0.9754 - val_loss: 0.0547 - val_accuracy: 0.9810 - lr: 0.0012
lr actual: tf.Tensor(0.00125, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0005848888922025552
lr nuevo: tf.Tensor(0.0005848889, shape=(), dtype=float32)
Epoch 8/45
346/346 [=====] - 107s 309ms/step - loss: 0.0462 - accuracy: 0.9836 - val_loss: 0.0412 - val_accuracy: 0.9861 - lr: 5.8489e-04
lr actual: tf.Tensor(0.0005848889, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00015076844803522921
lr nuevo: tf.Tensor(0.00015076845, shape=(), dtype=float32)
Epoch 9/45
346/346 [=====] - ETA: 0s - loss: 0.0384 - accuracy: 0.9875>saved snapshot /content/drive/My Drive/MAIR-Master/08MAIR-TFM/modelos/ensemble/mobilenet2
346/346 [=====] - 107s 309ms/step - loss: 0.0384 - accuracy: 0.9875 - val_loss: 0.0373 - val_accuracy: 0.9865 - lr: 1.5077e-04
lr actual: tf.Tensor(0.00015076845, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.005
lr nuevo: tf.Tensor(0.005, shape=(), dtype=float32)
Epoch 10/45
346/346 [=====] - 106s 307ms/step - loss: 0.0706 - accuracy: 0.9736 - val_loss: 0.0767 - val_accuracy: 0.9727 - lr: 0.0050
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0048492315519647715
lr nuevo: tf.Tensor(0.0048492313, shape=(), dtype=float32)
Epoch 11/45
346/346 [=====] - ETA: 0s - loss: 0.0808 - accuracy: 0.9718
Epoch 00011: ReduceLROnPlateau reducing learning rate to 0.0012123078340664506.
346/346 [=====] - 109s 316ms/step - loss: 0.0808 - accuracy: 0.9718 - val_loss: 0.1003 - val_accuracy: 0.9608 - lr: 0.0048
lr actual: tf.Tensor(0.0012123078, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004415111107797445
lr nuevo: tf.Tensor(0.004415111, shape=(), dtype=float32)
Epoch 12/45
346/346 [=====] - 112s 322ms/step - loss: 0.0578 - accuracy: 0.9793 - val_loss: 0.1508 - val_accuracy: 0.9573 - lr: 0.0044
lr actual: tf.Tensor(0.004415111, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00375
lr nuevo: tf.Tensor(0.00375, shape=(), dtype=float32)
Epoch 13/45
346/346 [=====] - 109s 316ms/step - loss: 0.0542 - accuracy: 0.9794 - val_loss: 0.1788 - val_accuracy: 0.9521 - lr: 0.0037
lr actual: tf.Tensor(0.00375, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0029341204441673263
lr nuevo: tf.Tensor(0.0029341204, shape=(), dtype=float32)
Epoch 14/45
346/346 [=====] - ETA: 0s - loss: 0.0456 - accuracy: 0.9835
Epoch 00014: ReduceLROnPlateau reducing learning rate to 0.0007335300906561315.
346/346 [=====] - 111s 320ms/step - loss: 0.0456 - accuracy: 0.9835 - val_loss: 0.1433 - val_accuracy: 0.9561 - lr: 0.0029
lr actual: tf.Tensor(0.0007335301, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0020658795558326742
lr nuevo: tf.Tensor(0.0020658795, shape=(), dtype=float32)
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Epoch 15/45
346/346 [=====] - 108s 313ms/step - loss: 0.0376 - accuracy: 0.9877 - val_loss: 0.0607 - val_accuracy: 0.9822 - lr: 0.0021
lr actual: tf.Tensor(0.0020658795, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0012500000000000007
lr nuevo: tf.Tensor(0.00125, shape=(), dtype=float32)
Epoch 16/45
346/346 [=====] - 108s 313ms/step - loss: 0.0313 - accuracy: 0.9883 - val_loss: 0.1028 - val_accuracy: 0.9707 - lr: 0.0012
lr actual: tf.Tensor(0.00125, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0005848888922025552
lr nuevo: tf.Tensor(0.0005848889, shape=(), dtype=float32)
Epoch 17/45
346/346 [=====] - ETA: 0s - loss: 0.0260 - accuracy: 0.9920
Epoch 00017: ReduceLRonPlateau reducing learning rate to 0.00014622222806792706.
346/346 [=====] - 108s 312ms/step - loss: 0.0260 - accuracy: 0.9920 - val_loss: 0.0818 - val_accuracy: 0.9770 - lr: 5.8489e-04
lr actual: tf.Tensor(0.00014622223, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00015076844803522921
lr nuevo: tf.Tensor(0.00015076845, shape=(), dtype=float32)
Epoch 18/45
346/346 [=====] - ETA: 0s - loss: 0.0229 - accuracy: 0.9928>saved snapshot /content/drive/My Drive/MAIR-Master/08MAIR-TFM/modelos/ensemble/mobilenet2
346/346 [=====] - 108s 313ms/step - loss: 0.0229 - accuracy: 0.9928 - val_loss: 0.0763 - val_accuracy: 0.9790 - lr: 1.5077e-04
lr actual: tf.Tensor(0.00015076845, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.005
lr nuevo: tf.Tensor(0.005, shape=(), dtype=float32)
Epoch 19/45
346/346 [=====] - 108s 312ms/step - loss: 0.0480 - accuracy: 0.9833 - val_loss: 0.4840 - val_accuracy: 0.8884 - lr: 0.0050
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0048492315519647715
lr nuevo: tf.Tensor(0.0048492313, shape=(), dtype=float32)
Epoch 20/45
346/346 [=====] - ETA: 0s - loss: 0.0496 - accuracy: 0.9823
Epoch 00020: ReduceLRonPlateau reducing learning rate to 0.0012123078340664506.
346/346 [=====] - 109s 314ms/step - loss: 0.0496 - accuracy: 0.9823 - val_loss: 0.2493 - val_accuracy: 0.9402 - lr: 0.0048
lr actual: tf.Tensor(0.0012123078, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004415111107797445
lr nuevo: tf.Tensor(0.004415111, shape=(), dtype=float32)
Epoch 21/45
346/346 [=====] - 109s 315ms/step - loss: 0.0478 - accuracy: 0.9834 - val_loss: 0.1113 - val_accuracy: 0.9679 - lr: 0.0044
lr actual: tf.Tensor(0.004415111, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00375
lr nuevo: tf.Tensor(0.00375, shape=(), dtype=float32)
Epoch 22/45
346/346 [=====] - 109s 315ms/step - loss: 0.0757 - accuracy: 0.9721 - val_loss: 0.1639 - val_accuracy: 0.9529 - lr: 0.0037
lr actual: tf.Tensor(0.00375, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0029341204441673263
lr nuevo: tf.Tensor(0.0029341204, shape=(), dtype=float32)
Epoch 23/45
346/346 [=====] - ETA: 0s - loss: 0.0425 - accuracy: 0.9850
Epoch 00023: ReduceLRonPlateau reducing learning rate to 0.0007335300906561315.
346/346 [=====] - 109s 315ms/step - loss: 0.0425 - accuracy: 0.9850 - val_loss: 0.1419 - val_accuracy: 0.9604 - lr: 0.0029
lr actual: tf.Tensor(0.0007335301, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0020658795558326742
lr nuevo: tf.Tensor(0.0020658795, shape=(), dtype=float32)
Epoch 24/45
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346/346 [=====] - 108s 313ms/step - loss: 0.0317 - accuracy: 0.9892 - val_loss: 0.1395 - val_accuracy: 0.9672 - lr: 0.0021
lr actual: tf.Tensor(0.0020658795, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0012500000000000007
lr nuevo: tf.Tensor(0.00125, shape=(), dtype=float32)
Epoch 25/45
346/346 [=====] - 108s 312ms/step - loss: 0.0220 - accuracy: 0.9935 - val_loss: 0.1050 - val_accuracy: 0.9743 - lr: 0.0012
lr actual: tf.Tensor(0.00125, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0005848888922025552
lr nuevo: tf.Tensor(0.0005848889, shape=(), dtype=float32)
Epoch 26/45
346/346 [=====] - ETA: 0s - loss: 0.0189 - accuracy: 0.9943
Epoch 00026: ReduceLROnPlateau reducing learning rate to 0.00014622222806792706.
346/346 [=====] - 107s 310ms/step - loss: 0.0189 - accuracy: 0.9943 - val_loss: 0.0844 - val_accuracy: 0.9786 - lr: 5.8489e-04
lr actual: tf.Tensor(0.00014622223, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00015076844803522921
lr nuevo: tf.Tensor(0.00015076845, shape=(), dtype=float32)
Epoch 27/45
346/346 [=====] - ETA: 0s - loss: 0.0167 - accuracy: 0.9947>saved snapshot /content/drive/My Drive/MAIR-Master/08MAIR-TFM/modelos/ensemble/mobilenet2
346/346 [=====] - 108s 311ms/step - loss: 0.0167 - accuracy: 0.9947 - val_loss: 0.0760 - val_accuracy: 0.9786 - lr: 1.5077e-04
lr actual: tf.Tensor(0.00015076845, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.005
lr nuevo: tf.Tensor(0.005, shape=(), dtype=float32)
Epoch 28/45
346/346 [=====] - 107s 309ms/step - loss: 0.0446 - accuracy: 0.9842 - val_loss: 0.0720 - val_accuracy: 0.9767 - lr: 0.0050
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0048492315519647715
lr nuevo: tf.Tensor(0.0048492313, shape=(), dtype=float32)
Epoch 29/45
346/346 [=====] - ETA: 0s - loss: 0.0489 - accuracy: 0.9828
Epoch 00029: ReduceLROnPlateau reducing learning rate to 0.0012123078340664506.
346/346 [=====] - 108s 312ms/step - loss: 0.0489 - accuracy: 0.9828 - val_loss: 0.1694 - val_accuracy: 0.9509 - lr: 0.0048
lr actual: tf.Tensor(0.0012123078, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004415111107797445
lr nuevo: tf.Tensor(0.004415111, shape=(), dtype=float32)
Epoch 30/45
346/346 [=====] - 107s 310ms/step - loss: 0.0409 - accuracy: 0.9862 - val_loss: 0.1372 - val_accuracy: 0.9664 - lr: 0.0044
lr actual: tf.Tensor(0.004415111, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00375
lr nuevo: tf.Tensor(0.00375, shape=(), dtype=float32)
Epoch 31/45
346/346 [=====] - 107s 309ms/step - loss: 0.0372 - accuracy: 0.9873 - val_loss: 0.0939 - val_accuracy: 0.9763 - lr: 0.0037
lr actual: tf.Tensor(0.00375, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0029341204441673263
lr nuevo: tf.Tensor(0.0029341204, shape=(), dtype=float32)
Epoch 32/45
346/346 [=====] - ETA: 0s - loss: 0.0384 - accuracy: 0.9865
Epoch 00032: ReduceLROnPlateau reducing learning rate to 0.0007335300906561315.
346/346 [=====] - 107s 310ms/step - loss: 0.0384 - accuracy: 0.9865 - val_loss: 0.0718 - val_accuracy: 0.9774 - lr: 0.0029
lr actual: tf.Tensor(0.0007335301, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00206587955558326742
lr nuevo: tf.Tensor(0.0020658795, shape=(), dtype=float32)
Epoch 33/45
346/346 [=====] - 107s 309ms/step - loss: 0.0302 - accuracy: 0.9890 - val_loss: 0.0298 - val_accuracy: 0.9889 - lr: 0.0021
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lr actual: tf.Tensor(0.0020658795, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0012500000000000007
lr nuevo: tf.Tensor(0.00125, shape=(), dtype=float32)
Epoch 34/45
346/346 [=====] - 107s 310ms/step - loss: 0.0233 - accuracy: 0.9924 - val_loss: 0.0510 - val_accuracy: 0.9854 - lr: 0.0012
lr actual: tf.Tensor(0.00125, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0005848888922025552
lr nuevo: tf.Tensor(0.0005848889, shape=(), dtype=float32)
Epoch 35/45
346/346 [=====] - 107s 310ms/step - loss: 0.0188 - accuracy: 0.9947 - val_loss: 0.0473 - val_accuracy: 0.9858 - lr: 5.8489e-04
lr actual: tf.Tensor(0.0005848889, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00015076844803522921
lr nuevo: tf.Tensor(0.00015076845, shape=(), dtype=float32)
Epoch 36/45
346/346 [=====] - ETA: 0s - loss: 0.0140 - accuracy: 0.9951>saved snapshot /content/drive/My Drive/MAIR-Master/08MAIR-TFM/modelos/ensemble/mobilenet2

Epoch 00036: ReduceLROnPlateau reducing learning rate to 3.7692112528020516e-05.
346/346 [=====] - 108s 312ms/step - loss: 0.0140 - accuracy: 0.9951 - val_loss: 0.0542 - val_accuracy: 0.9846 - lr: 1.5077e-04
lr actual: tf.Tensor(3.7692113e-05, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.005
lr nuevo: tf.Tensor(0.005, shape=(), dtype=float32)
Epoch 37/45
346/346 [=====] - 109s 316ms/step - loss: 0.0313 - accuracy: 0.9880 - val_loss: 0.1806 - val_accuracy: 0.9600 - lr: 0.0050
lr actual: tf.Tensor(0.005, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0048492315519647715
lr nuevo: tf.Tensor(0.0048492313, shape=(), dtype=float32)
Epoch 38/45
346/346 [=====] - 108s 313ms/step - loss: 0.0354 - accuracy: 0.9882 - val_loss: 0.2070 - val_accuracy: 0.9426 - lr: 0.0048
lr actual: tf.Tensor(0.0048492313, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.004415111107797445
lr nuevo: tf.Tensor(0.004415111, shape=(), dtype=float32)
Epoch 39/45
346/346 [=====] - ETA: 0s - loss: 0.0418 - accuracy: 0.9849
Epoch 00039: ReduceLROnPlateau reducing learning rate to 0.0011037777876481414.
346/346 [=====] - 108s 312ms/step - loss: 0.0418 - accuracy: 0.9849 - val_loss: 0.2645 - val_accuracy: 0.9466 - lr: 0.0044
lr actual: tf.Tensor(0.0011037778, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00375
lr nuevo: tf.Tensor(0.00375, shape=(), dtype=float32)
Epoch 40/45
346/346 [=====] - 108s 312ms/step - loss: 0.0260 - accuracy: 0.9913 - val_loss: 0.3923 - val_accuracy: 0.9252 - lr: 0.0037
lr actual: tf.Tensor(0.00375, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0029341204441673263
lr nuevo: tf.Tensor(0.0029341204, shape=(), dtype=float32)
Epoch 41/45
346/346 [=====] - 108s 311ms/step - loss: 0.0211 - accuracy: 0.9933 - val_loss: 0.1169 - val_accuracy: 0.9774 - lr: 0.0029
lr actual: tf.Tensor(0.0029341204, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0020658795558326742
lr nuevo: tf.Tensor(0.0020658795, shape=(), dtype=float32)
Epoch 42/45
346/346 [=====] - ETA: 0s - loss: 0.0183 - accuracy: 0.9933
Epoch 00042: ReduceLROnPlateau reducing learning rate to 0.0005164698814041913.
346/346 [=====] - 108s 311ms/step - loss: 0.0183 - accuracy: 0.9933 - val_loss: 0.0825 - val_accuracy: 0.9834 - lr: 0.0021
lr actual: tf.Tensor(0.0005164699, shape=(), dtype=float32)
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lr maximo: 0.005 propuesto: 0.0012500000000000007
lr nuevo: tf.Tensor(0.00125, shape=(), dtype=float32)
Epoch 43/45
346/346 [=====] - 108s 312ms/step - loss: 0.0262 - accuracy: 0.9908 - val_loss: 0.1016 - val_accuracy: 0.9743 - lr: 0.0012
lr actual: tf.Tensor(0.00125, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.0005848888922025552
lr nuevo: tf.Tensor(0.0005848889, shape=(), dtype=float32)
Epoch 44/45
346/346 [=====] - 108s 312ms/step - loss: 0.0177 - accuracy: 0.9947 - val_loss: 0.0988 - val_accuracy: 0.9778 - lr: 5.8489e-04
lr actual: tf.Tensor(0.0005848889, shape=(), dtype=float32)
lr maximo: 0.005 propuesto: 0.00015076844803522921
lr nuevo: tf.Tensor(0.00015076845, shape=(), dtype=float32)
Epoch 45/45
346/346 [=====] - ETA: 0s - loss: 0.0161 - accuracy: 0.9957>saved snapshot /content/drive/My Drive/MAIR-Master/08MAIR-TFM/modelos/ensemble/mobilenet2

Epoch 00045: ReduceLROnPlateau reducing learning rate to 3.7692112528020516e-05.
346/346 [=====] - 108s 311ms/step - loss: 0.0161 - accuracy: 0.9957 - val_loss: 0.0835 - val_accuracy: 0.9798 - lr: 1.5077e-04
Train: 0.999, Test: 0.980
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