

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:66: The name tf.get_default_graph is deprecated. Please use tf.get_default_graph().

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:541: The name tf.placeholder_with_shape is deprecated. Please use tf.placeholder().

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:4432: The name tf.random_uniform is deprecated. Please use tf.random.uniform.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:2041: The name tf.nn.fused_batch_norm is deprecated. Please use tf.nn.fused_batch_norm.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:148: The name tf.placeholder_with_shape is deprecated. Please use tf.placeholder().

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:4267: The name tf.nn.max_pool is deprecated. Please use tf.nn.max_pool.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:216: The name tf.is_variable_initialized is deprecated. Please use tf.variables_initialized.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:223: The name tf.variable_scope is deprecated. Please use tf.compat.v1.variable_scope.

```

=====
Experimento Xception 12a
experimento = Experimento Xception 12a
model = <keras.engine.training.Model object at 0x7f1a84a87668>
samples_per_class = 100
number_of_classes = 102
optimizador = Adam
clasificador = XCEPTION-3
batch_size = 128
epochs = 20
run_experiment = True

```

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Creando sub-conjunto de datos con 102 clases y 100 muestras por clase
number_of_classes: 102
Sub-conjunto con 102 clases creado.
Cantidad de muestras: 6398
Creando datos de train, validate y test ...
Datos de train, validate y test creados.

```

```

Split de Entrenamiento, Validación y prueba: 4478, 960, 960
Número de clases: 102
Número de muestras: 100
Usando Adam

```

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/optimizers.py:793: The name tf.train.Optimizer is deprecated. Please use tf.compat.v1.Optimizer.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:3576: The name tf.log is deprecated. Please use tf.math.log.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/tensorflow_core/python/ops/math_grad.py:1424: where (from tensorflow.python.ops.math_ops) is deprecated and will be removed in a future version. Instructions for updating:

Use tf.where in 2.0, which has the same broadcast rule as np.where

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:1033: The name tf.assign is deprecated. Please use tf.compat.v1.assign.

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow_backend.py:1020: The name tf.assign is deprecated. Please use tf.compat.v1.assign.

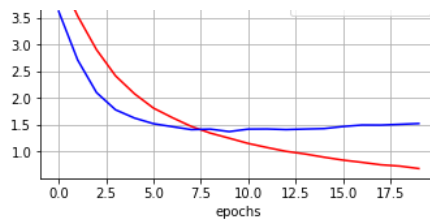
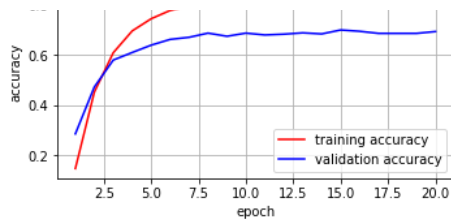
Train on 4478 samples, validate on 960 samples

```

Epoch 1/20
4478/4478 [=====] - 15s 3ms/step - loss: 4.2873 - acc: 0.1474 - val_loss: 3.6151 - val_acc: 0.2854
Epoch 2/20
4478/4478 [=====] - 5s 1ms/step - loss: 3.5290 - acc: 0.4513 - val_loss: 2.7087 - val_acc: 0.4719
Epoch 3/20
4478/4478 [=====] - 5s 1ms/step - loss: 2.8974 - acc: 0.6083 - val_loss: 2.0979 - val_acc: 0.5792
Epoch 4/20
4478/4478 [=====] - 5s 1ms/step - loss: 2.4114 - acc: 0.6952 - val_loss: 1.7776 - val_acc: 0.6094
Epoch 5/20
4478/4478 [=====] - 5s 1ms/step - loss: 2.0765 - acc: 0.7436 - val_loss: 1.6235 - val_acc: 0.6385
Epoch 6/20
4478/4478 [=====] - 5s 1ms/step - loss: 1.8097 - acc: 0.7767 - val_loss: 1.5181 - val_acc: 0.6615
Epoch 7/20
4478/4478 [=====] - 5s 1ms/step - loss: 1.6305 - acc: 0.7959 - val_loss: 1.4622 - val_acc: 0.6698
Epoch 8/20
4478/4478 [=====] - 5s 1ms/step - loss: 1.4664 - acc: 0.8207 - val_loss: 1.4077 - val_acc: 0.6865
Epoch 9/20
4478/4478 [=====] - 5s 1ms/step - loss: 1.3433 - acc: 0.8325 - val_loss: 1.4168 - val_acc: 0.6740
Epoch 10/20
4478/4478 [=====] - 5s 1ms/step - loss: 1.2474 - acc: 0.8508 - val_loss: 1.3705 - val_acc: 0.6865
Epoch 11/20
4478/4478 [=====] - 5s 1ms/step - loss: 1.1496 - acc: 0.8566 - val_loss: 1.4169 - val_acc: 0.6792
Epoch 12/20
4478/4478 [=====] - 5s 1ms/step - loss: 1.0732 - acc: 0.8727 - val_loss: 1.4194 - val_acc: 0.6823
Epoch 13/20
4478/4478 [=====] - 5s 1ms/step - loss: 1.0020 - acc: 0.8765 - val_loss: 1.4082 - val_acc: 0.6875
Epoch 14/20
4478/4478 [=====] - 5s 1ms/step - loss: 0.9532 - acc: 0.8808 - val_loss: 1.4183 - val_acc: 0.6833
Epoch 15/20
4478/4478 [=====] - 5s 1ms/step - loss: 0.8927 - acc: 0.8950 - val_loss: 1.4266 - val_acc: 0.6990
Epoch 16/20
4478/4478 [=====] - 5s 1ms/step - loss: 0.8389 - acc: 0.8977 - val_loss: 1.4650 - val_acc: 0.6937
Epoch 17/20
4478/4478 [=====] - 5s 1ms/step - loss: 0.7969 - acc: 0.8991 - val_loss: 1.4933 - val_acc: 0.6854
Epoch 18/20
4478/4478 [=====] - 5s 1ms/step - loss: 0.7512 - acc: 0.9098 - val_loss: 1.4920 - val_acc: 0.6854
Epoch 19/20
4478/4478 [=====] - 5s 1ms/step - loss: 0.7269 - acc: 0.9118 - val_loss: 1.5061 - val_acc: 0.6854
Epoch 20/20
4478/4478 [=====] - 5s 1ms/step - loss: 0.6813 - acc: 0.9167 - val_loss: 1.5209 - val_acc: 0.6927

```





Exactitud en subconjunto de test:
 Test loss: 1.3516699175039928
 Test accuracy: 0.7

Exactitud en todo el dataset:
 Test loss: 1.3638679247519063
 Test accuracy: 0.7054127939220594

Experimento Xception 12b
 Experimento saltado

Experimento Xception 12c
 Experimento saltado

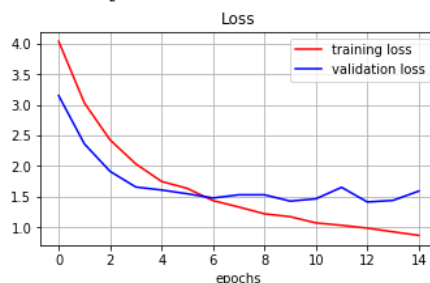
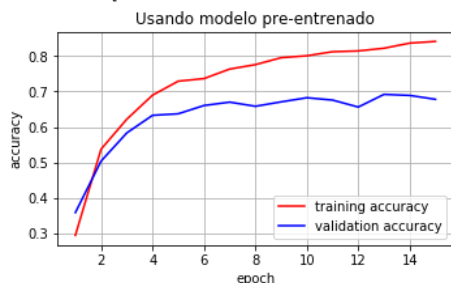
Experimento Xception 13a
 experimento = Experimento Xception 13a
 model = <keras.engine.training.Model object at 0x7f1a84a87668>
 samples_per_class = 1000
 number_of_classes = 102
 optimizador = Adam
 clasificador = XCEPTION-3
 batch_size = 128
 epochs = 15
 run_experiment = True

Creando sub-conjunto de datos con 102 clases y 1000 muestras por clase
 number_of_classes: 102
 Sub-conjunto con 102 clases creado.
 Cantidad de muestras: 9145
 Creando datos de train, validate y test ...
 Datos de train, validate y test creados.

Split de Entrenamiento, Validación y prueba: 6401, 1372, 1372
 Número de clases: 102
 Número de muestras: 1000
 Usando Adam

Train on 6401 samples, validate on 1372 samples

Epoch 1/15
 6401/6401 [=====] - 11s 2ms/step - loss: 4.0308 - acc: 0.2945 - val_loss: 3.1479 - val_acc: 0.3586
 Epoch 2/15
 6401/6401 [=====] - 8s 1ms/step - loss: 3.0290 - acc: 0.5373 - val_loss: 2.3615 - val_acc: 0.5036
 Epoch 3/15
 6401/6401 [=====] - 8s 1ms/step - loss: 2.4258 - acc: 0.6218 - val_loss: 1.9140 - val_acc: 0.5831
 Epoch 4/15
 6401/6401 [=====] - 8s 1ms/step - loss: 2.0359 - acc: 0.6894 - val_loss: 1.6591 - val_acc: 0.6327
 Epoch 5/15
 6401/6401 [=====] - 8s 1ms/step - loss: 1.7503 - acc: 0.7289 - val_loss: 1.6107 - val_acc: 0.6370
 Epoch 6/15
 6401/6401 [=====] - 8s 1ms/step - loss: 1.6368 - acc: 0.7361 - val_loss: 1.5496 - val_acc: 0.6603
 Epoch 7/15
 6401/6401 [=====] - 8s 1ms/step - loss: 1.4382 - acc: 0.7630 - val_loss: 1.4809 - val_acc: 0.6698
 Epoch 8/15
 6401/6401 [=====] - 8s 1ms/step - loss: 1.3341 - acc: 0.7755 - val_loss: 1.5324 - val_acc: 0.6582
 Epoch 9/15
 6401/6401 [=====] - 8s 1ms/step - loss: 1.2226 - acc: 0.7950 - val_loss: 1.5326 - val_acc: 0.6706
 Epoch 10/15
 6401/6401 [=====] - 8s 1ms/step - loss: 1.1762 - acc: 0.8005 - val_loss: 1.4301 - val_acc: 0.6822
 Epoch 11/15
 6401/6401 [=====] - 8s 1ms/step - loss: 1.0746 - acc: 0.8119 - val_loss: 1.4668 - val_acc: 0.6757
 Epoch 12/15
 6401/6401 [=====] - 8s 1ms/step - loss: 1.0356 - acc: 0.8141 - val_loss: 1.6546 - val_acc: 0.6560
 Epoch 13/15
 6401/6401 [=====] - 8s 1ms/step - loss: 0.9896 - acc: 0.8217 - val_loss: 1.4157 - val_acc: 0.6917
 Epoch 14/15
 6401/6401 [=====] - 8s 1ms/step - loss: 0.9296 - acc: 0.8361 - val_loss: 1.4414 - val_acc: 0.6888
 Epoch 15/15
 6401/6401 [=====] - 8s 1ms/step - loss: 0.8724 - acc: 0.8410 - val_loss: 1.5931 - val_acc: 0.6778



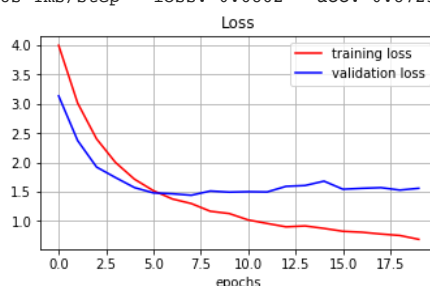
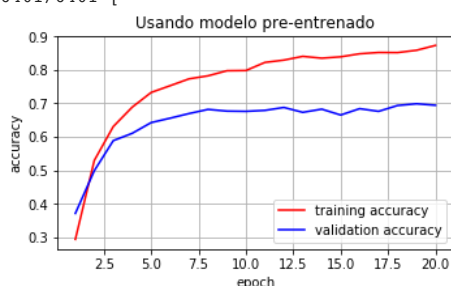
Exactitud en subconjunto de test:
 Test loss: 1.6007500605402465
 Test accuracy: 0.6537900874635568

Exactitud en todo el dataset:

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Test loss: 1.3940380302938125
Test accuracy: 0.6966648442097346
=====
Experimento Xception 13b
experimento = Experimento Xception 13b
model = <keras.engine.training.Model object at 0x7f1a84a87668>
samples_per_class = 1000
number_of_classes = 102
optimizador = Adam
clasificador = XCEPTION-3
batch_size = 128
epochs = 20
run_experiment = True
-----
Número de clases: 102
Número de muestras: 1000
Usando Adam
Train on 6401 samples, validate on 1372 samples
Epoch 1/20
6401/6401 [=====] - 11s 2ms/step - loss: 3.9964 - acc: 0.2935 - val_loss: 3.1339 - val_acc: 0.3710
Epoch 2/20
6401/6401 [=====] - 8s 1ms/step - loss: 3.0126 - acc: 0.5291 - val_loss: 2.3726 - val_acc: 0.4985
Epoch 3/20
6401/6401 [=====] - 8s 1ms/step - loss: 2.4006 - acc: 0.6302 - val_loss: 1.9197 - val_acc: 0.5882
Epoch 4/20
6401/6401 [=====] - 8s 1ms/step - loss: 1.9979 - acc: 0.6882 - val_loss: 1.7406 - val_acc: 0.6101
Epoch 5/20
6401/6401 [=====] - 8s 1ms/step - loss: 1.7128 - acc: 0.7321 - val_loss: 1.5696 - val_acc: 0.6421
Epoch 6/20
6401/6401 [=====] - 8s 1ms/step - loss: 1.5164 - acc: 0.7522 - val_loss: 1.4785 - val_acc: 0.6552
Epoch 7/20
6401/6401 [=====] - 8s 1ms/step - loss: 1.3752 - acc: 0.7727 - val_loss: 1.4637 - val_acc: 0.6691
Epoch 8/20
6401/6401 [=====] - 8s 1ms/step - loss: 1.2969 - acc: 0.7818 - val_loss: 1.4390 - val_acc: 0.6815
Epoch 9/20
6401/6401 [=====] - 8s 1ms/step - loss: 1.1656 - acc: 0.7969 - val_loss: 1.5110 - val_acc: 0.6764
Epoch 10/20
6401/6401 [=====] - 8s 1ms/step - loss: 1.1262 - acc: 0.7975 - val_loss: 1.4921 - val_acc: 0.6757
Epoch 11/20
6401/6401 [=====] - 8s 1ms/step - loss: 1.0172 - acc: 0.8217 - val_loss: 1.4995 - val_acc: 0.6786
Epoch 12/20
6401/6401 [=====] - 8s 1ms/step - loss: 0.9571 - acc: 0.8286 - val_loss: 1.4952 - val_acc: 0.6873
Epoch 13/20
6401/6401 [=====] - 8s 1ms/step - loss: 0.8993 - acc: 0.8399 - val_loss: 1.5908 - val_acc: 0.6727
Epoch 14/20
6401/6401 [=====] - 8s 1ms/step - loss: 0.9149 - acc: 0.8344 - val_loss: 1.6052 - val_acc: 0.6822
Epoch 15/20
6401/6401 [=====] - 8s 1ms/step - loss: 0.8727 - acc: 0.8385 - val_loss: 1.6794 - val_acc: 0.6647
Epoch 16/20
6401/6401 [=====] - 8s 1ms/step - loss: 0.8233 - acc: 0.8475 - val_loss: 1.5415 - val_acc: 0.6837
Epoch 17/20
6401/6401 [=====] - 8s 1ms/step - loss: 0.8073 - acc: 0.8514 - val_loss: 1.5569 - val_acc: 0.6757
Epoch 18/20
6401/6401 [=====] - 8s 1ms/step - loss: 0.7771 - acc: 0.8511 - val_loss: 1.5686 - val_acc: 0.6931
Epoch 19/20
6401/6401 [=====] - 8s 1ms/step - loss: 0.7521 - acc: 0.8580 - val_loss: 1.5273 - val_acc: 0.6983
Epoch 20/20
6401/6401 [=====] - 8s 1ms/step - loss: 0.6862 - acc: 0.8725 - val_loss: 1.5574 - val_acc: 0.6939

```



```

Exactitud en subconjunto de test:
Test loss: 1.66223236145153
Test accuracy: 0.6574344023323615

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Exactitud en todo el dataset:
Test loss: 1.398380143388593
Test accuracy: 0.7065062875758109

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=====
Experimento Xception 13c
Experimento saltado

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