

Model: "sequential\_4"

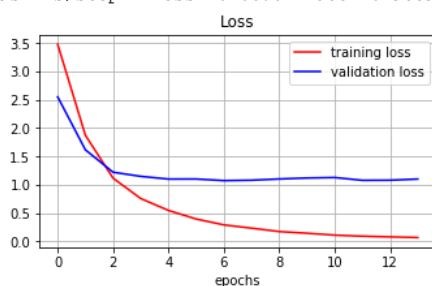
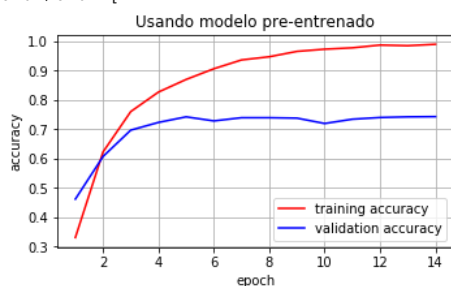
| Layer (type)                              | Output Shape       | Param #  |
|---|--------------------|----------|
| =====                                     | =====              | =====    |
| xception (Model)                          | (None, 4, 4, 2048) | 20861480 |
| global_average_pooling2d_4 ( (None, 2048) |                    | 0        |
| dense_7 (Dense)                           | (None, 2048)       | 4196352  |
| dropout_4 (Dropout)                       | (None, 2048)       | 0        |
| dense_8 (Dense)                           | (None, 102)        | 208998   |
| =====                                     | =====              | =====    |
| Total params: 25,266,830                  |                    |          |
| Trainable params: 9,154,150               |                    |          |
| Non-trainable params: 16,112,680          |                    |          |

Creando subset de datos ...  
Creando juegos de datos de train, validate y test ...  
Creando datos de train, validate y test ...  
Datos de train, validate y test creados.

Split de Entrenamiento, Validación y prueba: 6401, 1372, 1372  
Entrenando el modelo...

Train on 6401 samples, validate on 1372 samples

Epoch 1/14  
6401/6401 [=====] - 21s 3ms/step - loss: 3.4755 - acc: 0.3314 - val\_loss: 2.5487 - val\_acc: 0.462  
Epoch 2/14  
6401/6401 [=====] - 9s 1ms/step - loss: 1.8714 - acc: 0.6226 - val\_loss: 1.6146 - val\_acc: 0.6071  
Epoch 3/14  
6401/6401 [=====] - 9s 1ms/step - loss: 1.1153 - acc: 0.7599 - val\_loss: 1.2193 - val\_acc: 0.6968  
Epoch 4/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.7551 - acc: 0.8263 - val\_loss: 1.1468 - val\_acc: 0.7230  
Epoch 5/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.5455 - acc: 0.8692 - val\_loss: 1.0988 - val\_acc: 0.7420  
Epoch 6/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.3945 - acc: 0.9056 - val\_loss: 1.0998 - val\_acc: 0.7281  
Epoch 7/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.2909 - acc: 0.9356 - val\_loss: 1.0718 - val\_acc: 0.7391  
Epoch 8/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.2331 - acc: 0.9464 - val\_loss: 1.0787 - val\_acc: 0.7391  
Epoch 9/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.1736 - acc: 0.9647 - val\_loss: 1.1004 - val\_acc: 0.7376  
Epoch 10/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.1436 - acc: 0.9722 - val\_loss: 1.1176 - val\_acc: 0.7194  
Epoch 11/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.1101 - acc: 0.9769 - val\_loss: 1.1259 - val\_acc: 0.7340  
Epoch 12/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.0918 - acc: 0.9863 - val\_loss: 1.0767 - val\_acc: 0.7398  
Epoch 13/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.0793 - acc: 0.9841 - val\_loss: 1.0786 - val\_acc: 0.7420  
Epoch 14/14  
6401/6401 [=====] - 9s 1ms/step - loss: 0.0676 - acc: 0.9889 - val\_loss: 1.0992 - val\_acc: 0.7427



Exactitud en subconjunto de test:

Predict loss: 1.047851194098114

Predict accuracy: 0.7463556851311953

Exactitud sobre todo el dataset:

Predict loss: 0.7925544891290534

Predict accuracy: 0.8008747949112693

Modelo guardado en: /content/drive/My Drive/MAIR-Master/07MAIR-Actividad1/modelo\_pesos\_XCEPTION-FT\_1.hdf5

## Resultados del Fine-Tuning

El fine tuning mejoró bastante el modelo basado en Xception pero aún así no llegó a mejorar a la VGG16.

| Experimento   | Muestras*Clase | Optimizador | Clasificador | Batch Size | epocas | Tiempo Entrenamiento | Exac. Test | Exact. Full | Loss Test | Loss Full |
|---------------|----------------|-------------|--------------|------------|--------|----------------------|------------|-------------|-----------|-----------|
| XCEPTION-FT_1 | 1000           | Adam        | XCEPTION-5   | 64         | 14     | 147seg.              | 75%        | 80%         | 1.05      | 0.79      |

07MAIR\_XCEPTION-FT-1.pdf

► Otras pruebas (solo de referencia)