KaoKore status classification

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Kaokore Dataset

Collection of Facial Expressions

- dataset of cropped face images extracted from Japanese artwork

5552 images (256 x 256 x 3):

- 4238 Train
- 533 Dev
- 527 Test

Classified by:

- Gender (male/female)
- Social status

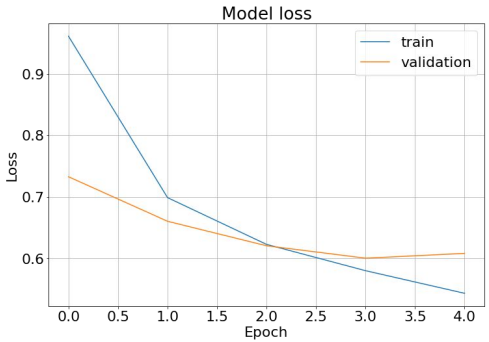
Data Augmentation

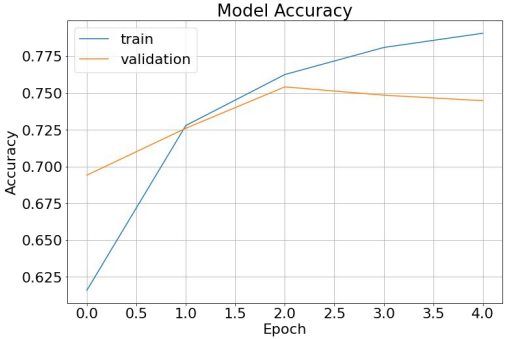
- Random Horizontal Flip
- Random Rotation (+-10%)
- Random Zoom (+-20%)

Pretrained Net:

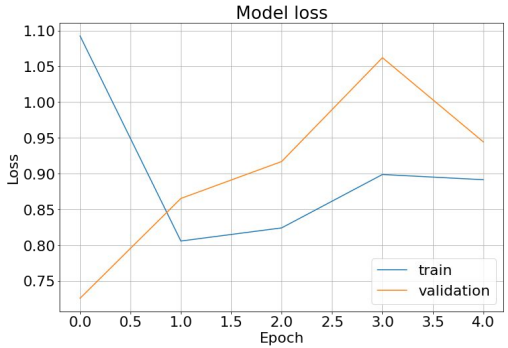
- input layer with image size
- exclude top layer
- freeze the base model - non trainable
- add new classification layer:
  - GlobalAvgPool
  - dropout with probability of 0.2 to avoid overfitting
  - dense with 4 neurons with ‘linear’ activation

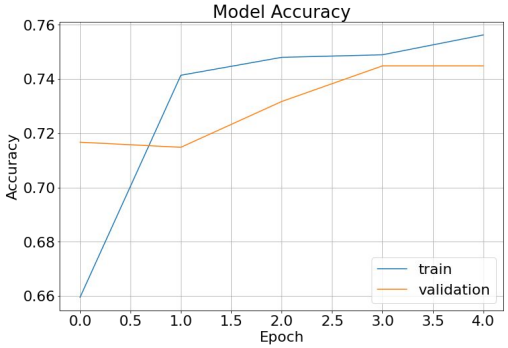
Pretrained Net: MobileNet



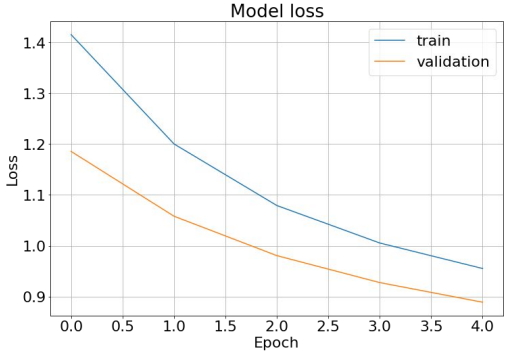


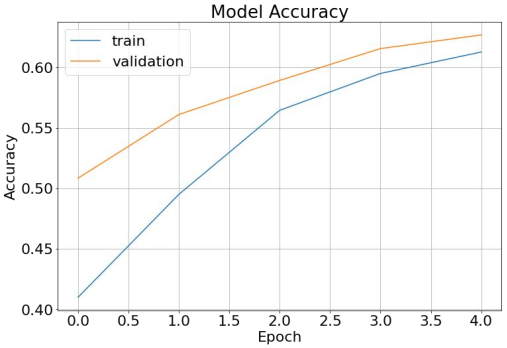
learning rate = 0.001
solver = Adam
loss = 0.596
accuracy = 0.744





learning rate = 0.01
solver = Adam
loss = 1.048
accuracy = 0.702





learning rate = 0.001
solver = SGD
loss = 0.884
accuracy = 0.620

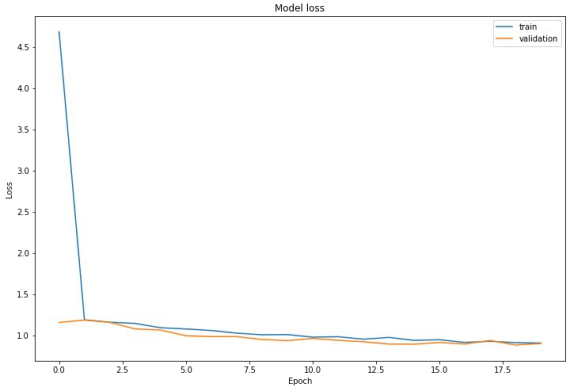
Custom CNN

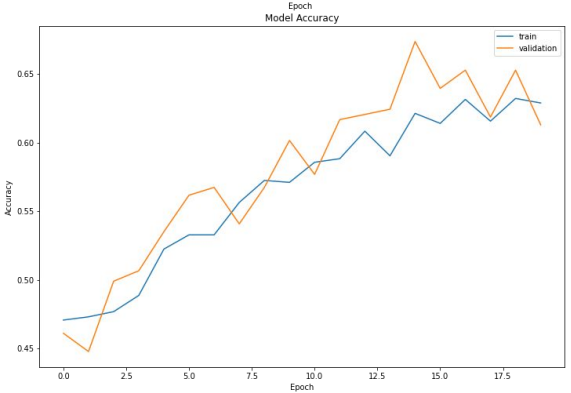
```
Model: "sequential 2"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
conv2d 5 (Conv2D)            (None, 86, 86, 16)        448
_________________________________________________________________
max pooling2d 5 (MaxPooling2 (None, 43, 43, 16)        0
_________________________________________________________________
conv2d 6 (Conv2D)            (None, 43, 43, 32)        4640
_________________________________________________________________
max pooling2d 6 (MaxPooling2 (None, 22, 22, 32)        0
_________________________________________________________________
conv2d 7 (Conv2D)            (None, 22, 22, 64)        51264
_________________________________________________________________
max pooling2d 7 (MaxPooling2 (None, 11, 11, 64)        0
_________________________________________________________________
conv2d 8 (Conv2D)            (None, 11, 11, 128)       204928
_________________________________________________________________
max pooling2d 8 (MaxPooling2 (None, 6, 6, 128)         0
_________________________________________________________________
dropout 1 (Dropout)          (None, 6, 6, 128)         0
_________________________________________________________________
flatten 1 (Flatten)          (None, 4608)              0
_________________________________________________________________
dense 2 (Dense)              (None, 64)                294976
_________________________________________________________________
dense 3 (Dense)              (None, 4)                 260
=================================================================
Total params: 556,516
Trainable params: 556,516
Non-trainable params: 0
```

```
CONV1   16, [3,3], strides = (3,3)
MAXPOOL
CONV2   32, [3,3]
MAXPOOL
CONV3   64, [5,5]
MAXPOOL
CONV4  128, [5,5]
Dropout 0.2
FN 64, relu
FN 4, softmax
```

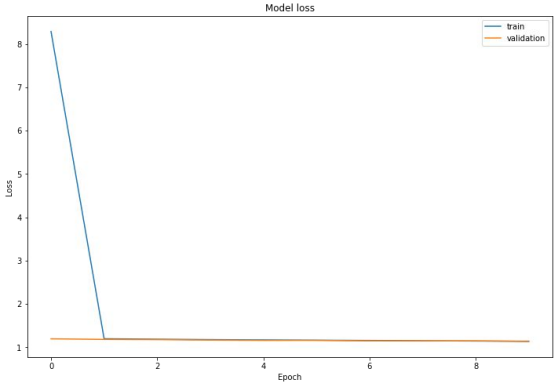
```
CONV activation = 'relu',padding= 'same'
MAXPOOL2D (3, 3),strides = (2,2), padding= 'same'
```

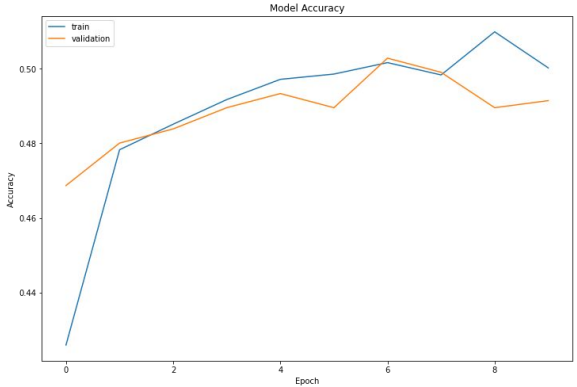
learning rate = 0.001
solver = Adam
loss = 0.906
accuracy = 0.613



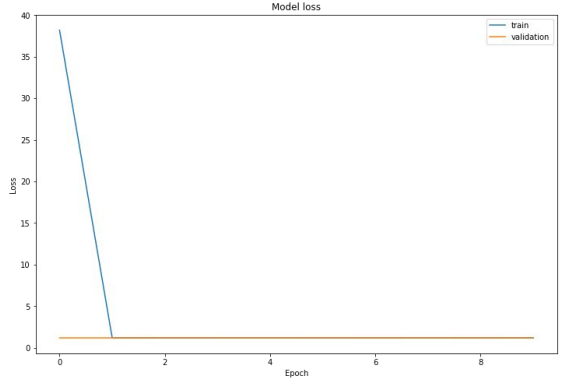


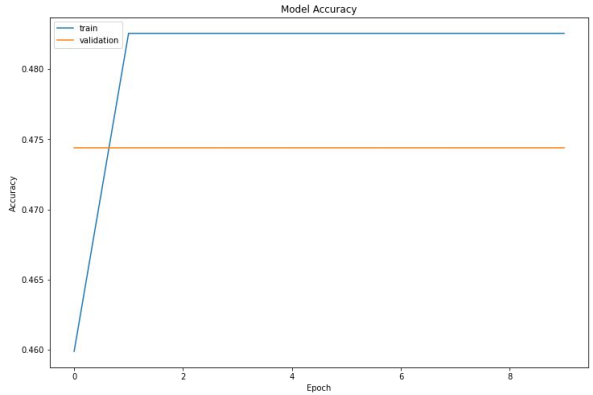
learning rate = 0.001
solver = SGD
loss = 0.613
accuracy = 0.491





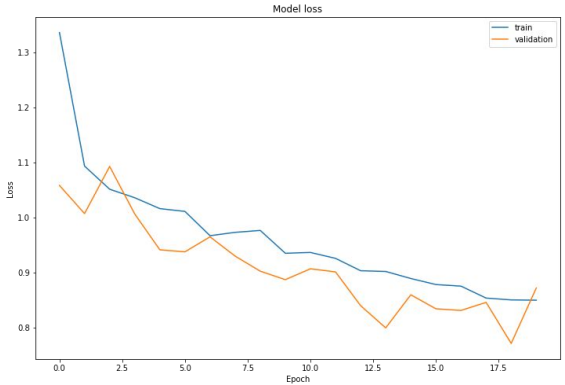
learning rate = 0.01
solver = Adam
loss = 1.19
accuracy = 0.474

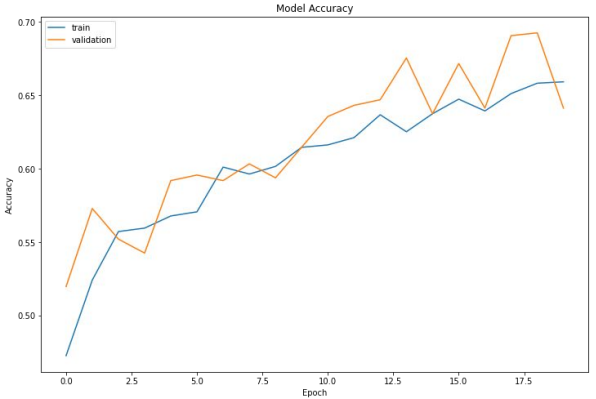




Custom CNN 2

CONV f = 16 32 64 64 128
loss = 0.871
accuracy = 0.641





CONV f = 16 32 64 128
loss = 0.906
accuracy = 0.613