SW91/2017 SW90/2016 SW91/2016
Nemanja Đuričić, Stefan Kikanović, Vladislav Milivojević
{djuricicnemanja015, stefan.kikanovic,} @gmail.com vladislavk2@yahoo.com
Fakultet Tehničkih Nauka, Novi Sad, Srbija

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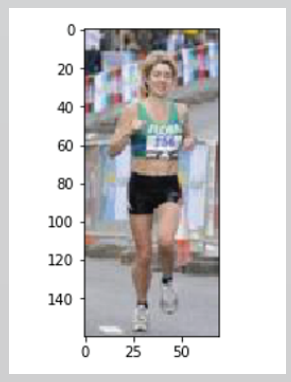
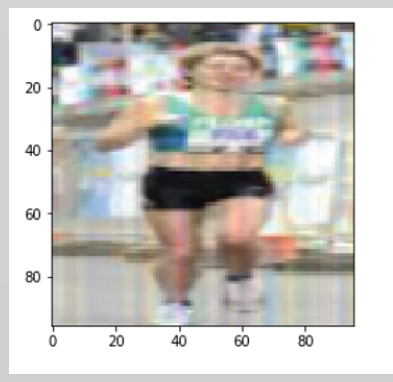
Prepoznavanje tipa sporta

Problem

Zadatak ovog projekta bio je da nad određenim dataset-om (slikama sportista), odraditi određene akcije i obučiti neuronsku mrežu da prepoznaje tip sporta na osnovu položaja sportiste sa slike.





```
['skiing', 'baseball', 'rowing', 'soccer', 'gymnastics', 'golf',
ng', 'badminton', 'volleyball', 'parkour', 'diving']
```

```
'athletics', 'sitting', 'cycling', 'tennis', 'riding', 'standi
```

Klase

```
Epoch 1/15
16800/16800 [==============================] - 217s - loss: 2.0601 - acc: 0.3277 - val_loss: 2.5276 - val_acc: 0.1800
Epoch 2/15
16800/16800 [==============================] - 212s - loss: 1.6058 - acc: 0.4774 - val_loss: 2.2045 - val_acc: 0.2225
Epoch 3/15
16800/16800 [==============================] - 213s - loss: 1.4332 - acc: 0.5414 - val_loss: 2.0238 - val_acc: 0.3250
16800/16800 [==============================] - 209s - loss: 0.5996 - acc: 0.8043 - val_loss: 1.4080 - val_acc: 0.6425
Epoch 13/15
16800/16800 [==============================] - 209s - loss: 0.5418 - acc: 0.8209 - val_loss: 1.2202 - val_acc: 0.6550
Epoch 14/15
16800/16800 [==============================] - 209s - loss: 0.4953 - acc: 0.8356 - val_loss: 1.5934 - val_acc: 0.6175
Epoch 15/15
16800/16800 [==============================] - 209s - loss: 0.4726 - acc: 0.8432 - val_loss: 1.2356 - val_acc: 0.6725
```

Rešenje

Prilikom obrade nad dataset-om pronašli smo 16 klasa (labela) koje smo zatim kategorizovali u matricu 16x16. Od ukupnih 2000 slika, za trening smo izdvojili 1200, validaciju 400 i test 400. Za treniranje neuronske mreže koristili smo Keras. Arhitektura mreže se sastoji iz 4 konvoluciona sloja, 2 potpuno povezana sloja i softmax output sloja, dok za back-propagation metodu smo koristili optimizer:adam i loss funkciju categorical_crossentropy, a zatim pustili model da se obučava u 15 epoha.

Rezultat

Nakon izvršavanja dobili smo sledeće rezultate:

Layer (type)	Output Shape	Param #	Connected to
convolution2d_1 (Convolution2D)	(None, 96, 96, 20)	980	convolution2d_input_1[0][0]
activation_1 (Activation)	(None, 96, 96, 20)	0	convolution2d_1[0][0]
maxpooling2d_1 (MaxPooling2D)	(None, 48, 48, 20)	0	activation_1[0][0]
batchnormalization_1 (BatchNorma	(None, 48, 48, 20)	80	maxpooling2d_1[0][0]
convolution2d_2 (Convolution2D)	(None, 48, 48, 15)	2715	batchnormalization_1[0][0]
activation_2 (Activation)	(None, 48, 48, 15)	0	convolution2d_2[0][0]
batchnormalization_2 (BatchNorma	(None, 48, 48, 15)	60	activation_2[0][0]
convolution2d_3 (Convolution2D)	(None, 48, 48, 12)	1632	batchnormalization_2[0][0]
activation_3 (Activation)	(None, 48, 48, 12)	0	convolution2d_3[0][0]
maxpooling2d_2 (MaxPooling2D)	(None, 24, 24, 12)	0	activation_3[0][0]
batchnormalization_3 (BatchNorma	(None, 24, 24, 12)	48	maxpooling2d_2[0][0]
convolution2d_4 (Convolution2D)	(None, 24, 24, 5)	245	batchnormalization_3[0][0]
activation_4 (Activation)	(None, 24, 24, 5)	0	convolution2d_4[0][0]
flatten_1 (Flatten)	(None, 2880)	0	activation_4[0][0]
dense_1 (Dense)	(None, 256)	737536	flatten_1[0][0]
activation_5 (Activation)	(None, 256)	0	dense_1[0][0]
dropout_1 (Dropout)	(None, 256)	0	activation_5[0][0]
dense_2 (Dense)	(None, 64)	16448	dropout_1[0][0]
activation_6 (Activation)	(None, 64)	0	dense_2[0][0]
dropout_2 (Dropout)	(None, 64)	0	activation_6[0][0]
dense_3 (Dense)	(None, 16)	1040	dropout_2[0][0]
activation_7 (Activation)	(None, 16)	0	dense_3[0][0]

Total params: 760,784
Trainable params: 760,690
Non-trainable params: 94

Model Summary

```
0. Correct: parkour , Predicted: parkour

1. Correct: tennis , Predicted: tennis

2. Correct: soccer , Predicted: soccer

3. Correct: tennis , Predicted: tennis

4. Correct: volleyball , Predicted: volleyball

5. Correct: sitting , Predicted: sitting

6. Correct: soccer , Predicted: soccer

7. Correct: baseball , Predicted: tennis

8. Correct: standing , Predicted: standing

9. Correct: baseball , Predicted: baseball

10. Correct: badminton , Predicted: badminton

11. Correct: volleyball , Predicted: tennis
```

Prediction