**PREPROCESSING – summary:**

During the assignment has performed two kinds of preprocessing: normalization and augmentation. The normalization phase has been included:scaling - dividing the dataset on 255, centering – subtracting the the featurewise mean from the dataset, standardizing – dividing the dataset by the featurewise standard deviation. When the normalization has been chosen, it has been applied on all the data set. The final value of a feature after the normalization is:

The augmentation has been included four types of changes: RandomFlip ("horizontal\_and\_vertical"), RandomRotation (factor =between 0.2 and 0.4), RandomZoom (factor =between -0.3 and 0.3), RandomContrast (factor =between 0.1 and 0.5). When the normalization has been chosen, it has been only applied on the training data set. The augmentation has been increased the amount of the training data set from 1760 examples to 8800.

**PREPROCESSING – experiments:**

As a part of the experiments has been performed performance comparison for the influence of preprocessing elements. For this comparison, the unpreprocessed model with the best results has been taken and has been compared to the same model with preprocessing mechanism.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **binary accuracy** | **recall** | **percision** | **AUC** | **Test Loss** | **One Shot Accuracy** |
| **Norm** =No, **Aug** = No | 0.670 | 0.670 | 0.660 | 0.721 | 1.442 | 0.232 |
| **Norm** =No, **Aug** = Yes | 0.622 | 0.628 | 0.621 | 0.674 | 0.715 | 0.206 |
| **Norm** =Yes, **Aug** = No | 0.512 | 0.450 | 0.514 | 0.507 | 1.929 | 0.076 |
| **Norm** =Yes, **Aug** = Yes | 0.538 | 0.394 | 0.553 | 0.529 | 0.703 | 0.080 |

As can be seen the model without preprocessing still has the best results. In addition, the augmentation decreased just a little bit the performance, but in case of such a small amount of data, the augmentation worth the decreasing in performance. In contrast, the normalization performed a poor performance and it shouldn't included on the final model.