7/21/2017

Computer Vision: Capstone Project

Report

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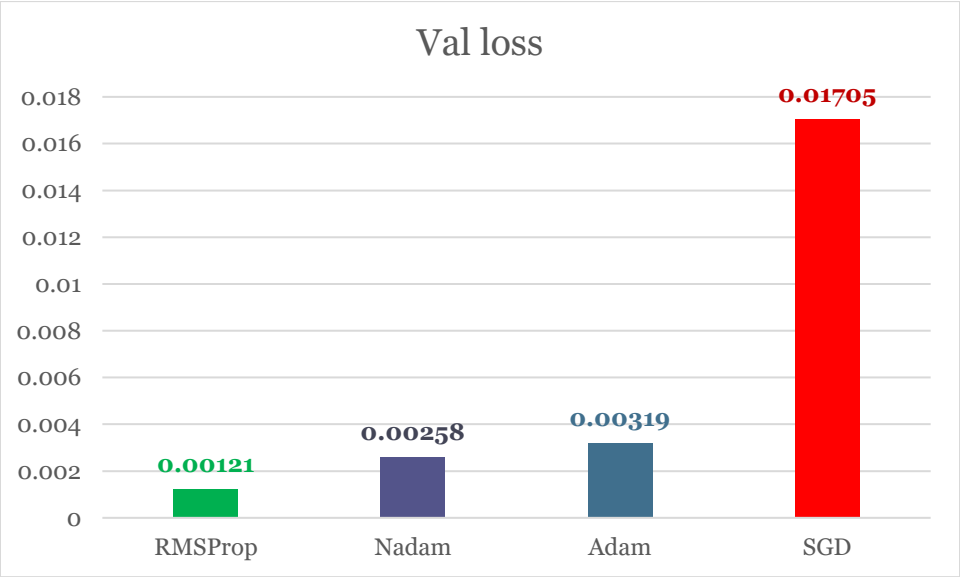
Summary

In this mini report I tried to capture the observations of using the following optimizers, under same conditions, i.e. metrics, batch size, training and validation set and network model.

1. RMSprop – Root Mean Square Propagation (http://www.cs.toronto.edu/~tijmen/csc321/slides/lecture_slides_lec6.pdf)
2. Nadam - Adam with Nesterov momentum (http://cs229.stanford.edu/proj2015/054_report.pdf)
3. Adam - an algorithm for first-order gradient-based optimization of stochastic objective functions (https://arxiv.org/pdf/1412.6980v8.pdf)
4. SGD



The optimizer RMSProp fared best and SDG fared worst. SGD is also slowest to converge, while RMSProp was fastest to minimize the losses.

The following sections also contain the visualization graphs of respective optimizer related model accuracies and model losses.

In addition, I also selected a bit complicated image with slanted faces of a couple as test example. SGD fared worst.

Adam

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Epoch 00041: val_loss improved from 0.00369 to 0.00319, saving model to we
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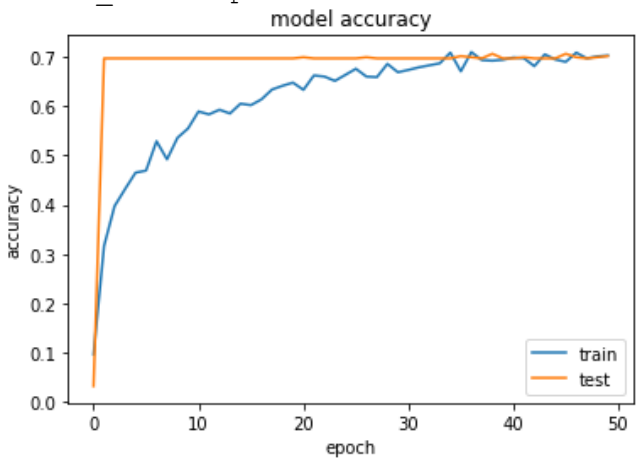

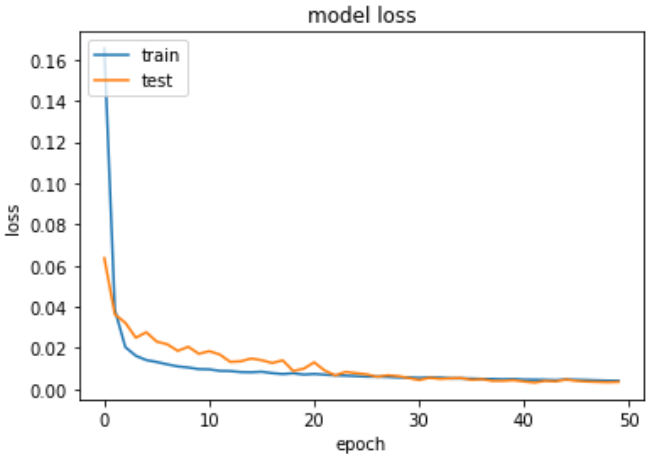


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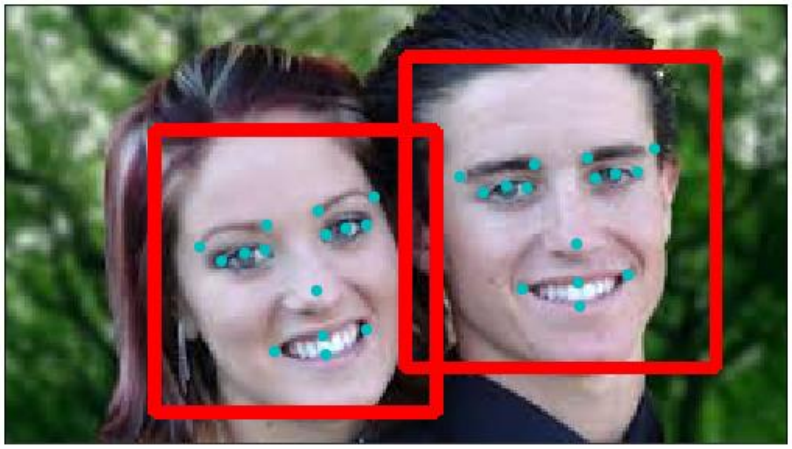

RMSPROP

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poch 00047: val_loss improved from 0.00130 to 0.00121, saving model to wei
ghts.best.rmsprop.hdf5
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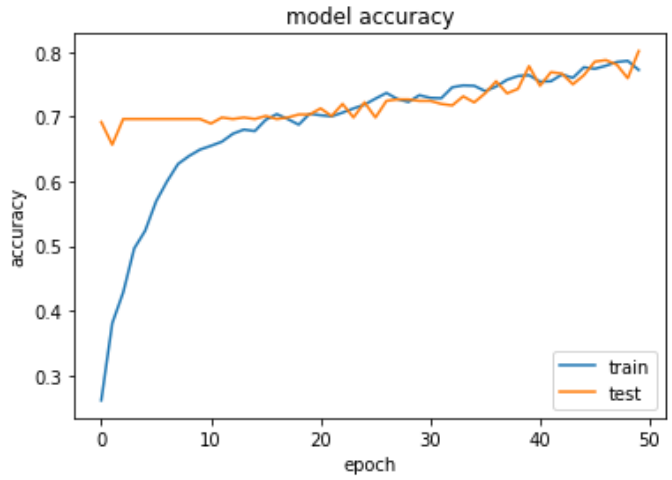

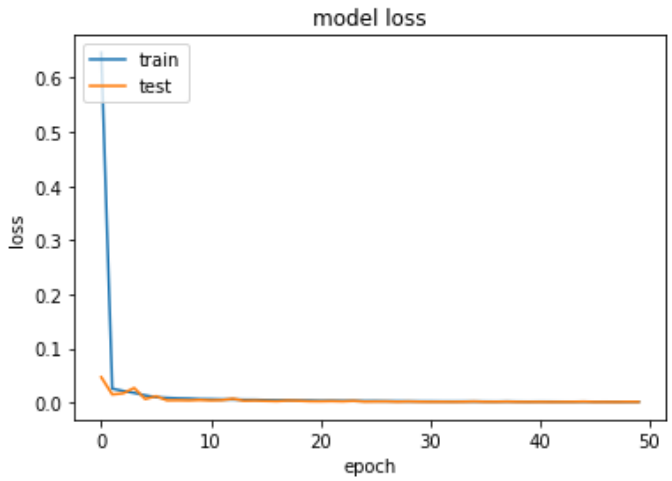

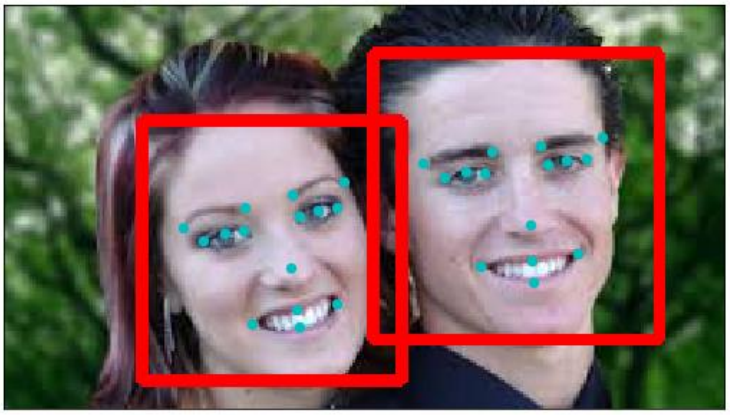

NADAM

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poch 00046: val_loss improved from 0.00265 to 0.00258, saving model to wei
ghts.best.nadam.hdf5
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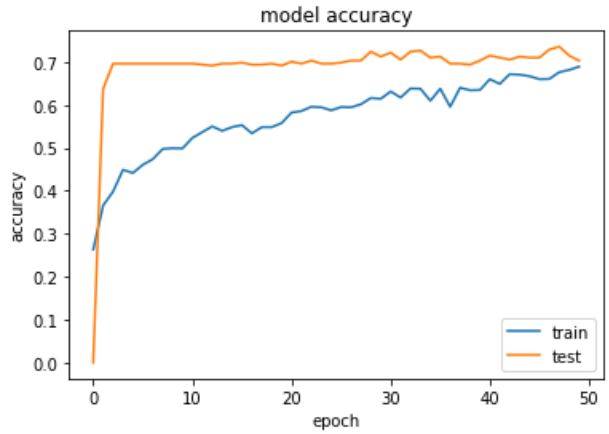

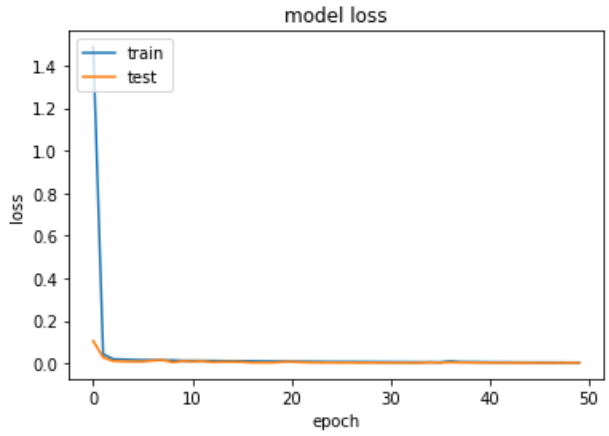

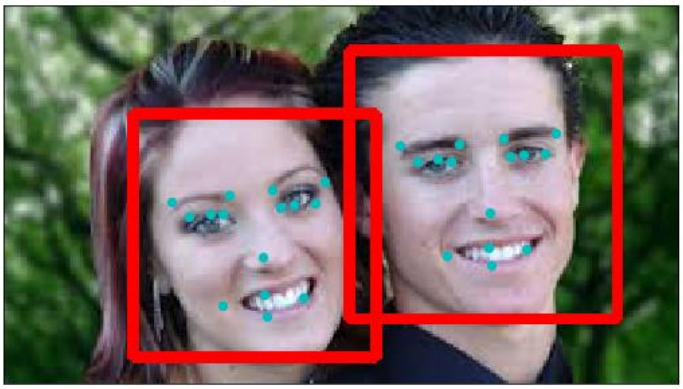

SGD

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poch 00049: val_loss improved from 0.01725 to 0.01705, saving model to wei
ghts.best.sgd.hdf5
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