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## Hello World!

# Callbacks in Deep Neural Networks

👤 [Tarun](#) ⌚ [October 22, 2020](#) 📁 [Technology](#) 💡 [callbacks](#), [Deep Learning](#), [neural networks](#)

**H**ello! Welcome <sup>BACK</sup>. Deep Neural Networks often take huge amount of time to train and we don't know lot of things in the initial phases like number of epochs, our model would take to generalize the train data & etc.

We would also like to quantify the performance of our model using several metrics while the model is being trained. That's where callbacks come into rescue. So, in this blog, We will discuss what are callbacks & why are they important while training a Deep Neural network. So Let's jump in.

## Callbacks

Call backs are classes with specific methods, that have access to the whole information inside the neural net while the model is being trained. We can make use of this technique to,

- Adaptively adjust learning rate.
- Early Stopping.
- Monitor performance.
- Checkpoint models.
- Terminate on NaN.
- Write training meta data to external files etc.

We can also write custom callbacks, the above mentioned are some of the most widely used callbacks while training deep neural networks. Let's get a bit deep into each of them, to know how they would help us increase our productivity.

## Early Stopping

Early stopping is a callback technique, used to stop the training of the model when its no longer performing better on the validation data. This is implemented by taking the performance of our model on validation data in last 'n' iterations into consideration.

This could help us hugely save large amount of computational resources and also allow us to tune the model more efficiently.

## Adaptive Learning Rate

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to the step size or the learning rate.

This makes the gradient descent find the global optimum for the trainable parameters of the model, else our model would not reach global optimum at any point while training.

## Model Checkpoint

Model check points are used to save models and associated weights and regular intervals. This technique can be particularly helpful when you have long training times, so that you can stop for a while and restart training after a period of time.

You can also keep track of the model which performed best on your validation data until now, and then retrieve the same model from the several checkpoints being saved when the model is being trained.

## Monitor Performance

We can always monitor the performance of the model being trained by using several metrics and we can visualize the training process with the help of this callback technique. This is usually done at regular intervals i.e. after a fixed number of iterations/epochs during the training period.

## Terminate on NaN

This is one of the mostly widely used callback, particularly during the research phases, as we might encounter NaN losses during the model training. This callback terminates the training as soon as NaN loss is encountered.

These are some callbacks which are used while training deep neural networks, but this is not an exhaustive list. We can always write custom callbacks whenever you find some use case, which would be helpful.

Yeah, that's all for this blog. Meet you soon in our next blog. Until then, stay safe. Cheers.. 🙌

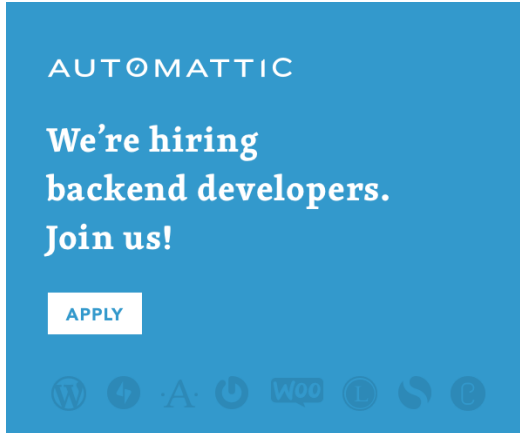
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## Training a Neural Net

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