Callback Functions → To customize the behaviour of a Keras model during training, evaluation or inference.

→ Callback functions are tools used in deep learning frameworks like TensorFlow and Keras to customize and extend the behavior of training processes

→ These functions are called at specific points during training, such as at the start or end of an epoch, before or after a batch, or before or after a training step.

Some common callback functions

→ (1) Model Checkpoint →

→ (2) Early Stopping

→ (3) TensorBoard

→ epochs = 1000

Optimizers — SGD

= 50

1 → 1000 → Iteration = 5

callback function → Early Stopping

→ Stop → Acc → No change

loss → No change

Validation set =

validation acc

(validation loss ↓↓)

(1) Model checkpoint → Model Save

1000 epochs = 500 ↓ models

Intution:

→ Saves the model's weights at certain intervals during training, typically when the validation loss decreases.

Example:

Useful to save the best model weights to avoid losing progress in case of unexpected interruptions or to later select the best-performing model based on validation metrics.

(2) Early Stopping

Intution → stop training when a monitored metric has stopped improving

Monitors a specified metric on the validation set and stops training if the metric stops improving for a certain number of epochs (patience).

Example

Prevents overfitting by halting training when the model's performance on the validation set starts to degrade.

1000 epochs → 30 ↓ Improve loss, acc

30 epochs → stops

(3) TensorBoard → visualize

Intution → epochs, time steps, iteration 30 epochs

Allows visualization of various metrics and model architectures during training using TensorBoard, a visualization tool.

Example

Visualizing training/validation loss, accuracy, and other metrics over time, as well as model graphs and histograms of weights and biases.