NPTEL ONLINE CERTIFICATION COURSES

Course Name: Deep Learning
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Topic

Lecture 46: Normalization

CONCEPTS COVERED

Concepts Covered:

❑ Deep Neural Network

    ❑ Gradient Descent Challenges

    ❑ Normalization

    ❑ Batch Normalization

    ❑ Layer Normalization
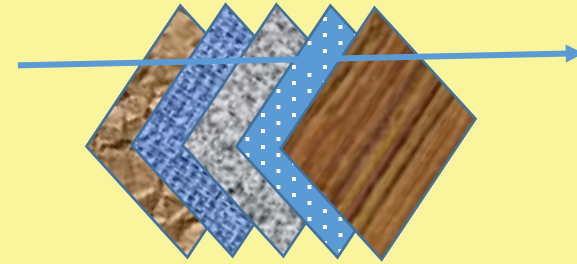
    ❑ Instance Normalization

    ❑ Group Normalization
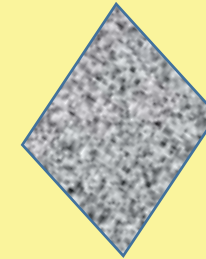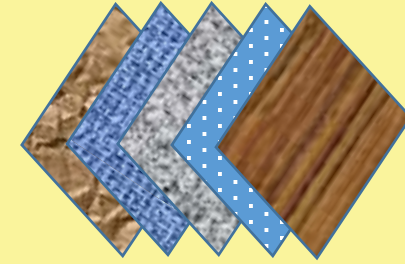
Normalization

Local Response Normalization (Inter-Channel)

$$b_{x,y}^i = \dfrac{a_{x,y}^i}{\left(k + \alpha \displaystyle\sum_{j=\max(0,i-n/2)}^{\min(N-1,i+n/2)} \left(a_{x,y}^j\right)^2\right)^{\beta}}$$

Local Response Normalization (Intra-Channel)

$$b^i_{x,y} = \frac{a^i_{x,y}}{\left(k + \alpha \sum_{p=\max(0,x-n/2)}^{\max(W,x+n/2)} \sum_{q=\max(0,y-n/2)}^{\min(H,y+n/2)} \left(a^i_{p,q} \right)^2 \right)^\beta}$$
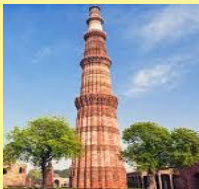
Normalization

- ❑ Normalization that address the problem of covariate shift.

- ❑ Makes learning process faster.

- ❑ Different layers learn independently of others.

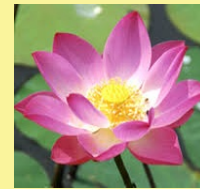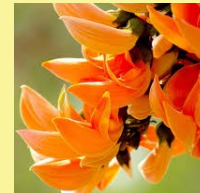What does a classifier learn?

Why normalization ?

Batch 1

Batch 2

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Thank you