Practical Session III: CNNs

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Outline

1. Implement a VGG-style convnet.

2. Overfitting and regularization using weight decay.

3. Self-supervised learning.

4. Visualization & data analysis.

Implement a VGG-style convnet

- VGGNet: runner-up in the ILSVRC 2014 competition.
- Much simpler to implement than the winner (Inception).
- Our flavour has been tweaked a bit:
  - Uses 7 instead of 19 layers.
  - Incorporates BatchNorm.
    - You'll play with using either batch or saved statistics.

Overfitting and regularization using weight decay

- Even with 7 layers, the model can overfit.
- Implement weight decay.
    - Understand the effect of the regularization hyperparameter.

Self-supervised learning

- CIFAR10 is a small dataset.
  - Lots of literature on augmenting this dataset.
  - We've implement a few simple data augmentations for you.
- You'll implement self-supervised learning.
  - Rotate an image by a random amount.
  - Predict how much the image has been rotated with an auxiliary loss.

Visualization & data analysis

- What is the convnet focusing on when it classifies an image?

- We’ll visualize the gradients with respect to the original image.

Let’s get started!

bit.ly/2XWtIfb

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