



Deep Learning
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Abstract

Deep learning is a field of Artificial Intelligence that focuses on methods to represent data. The Deep Learning motto is to learn semantic and rich representations by using hierarchical models. When Deep Learning methods are applied to photographic images, they discover compositional cascades of features that capture increasingly complex patterns: from simple edge detectors at the lowest layers to contour features and object parts at the higher layers.

There are many methods and training protocols in Deep Learning, depending on the application and availability of labeled data. In this lecture I will review the most popular image classification system, namely the convolutional network, and I will describe a feature learning method based on sparse coding. I will provide practical tips for when and how to use them, and point the audience to publicly available software packages.

In the last part of the lecture, I will briefly overview other applications of Deep Learning such as object detection and OCR, and I will discuss the challenges this field is facing and speculate about possible forthcoming breakthroughs we can expect in the near future.

Keywords

deep learning, convnet, sparse coding, recognition