Convolutional neural networks

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1   Introduction

Convolutional neural networks are a variant of Multilayer Perceptron, one difference is that convnets are biologically inspired, are inspired in the visual cortex of cats, therefore networks are used to classify images because of the fact that it can extract and learn the features of images; however, to classify new images is needed a classifier at the output of the net.

Convolutional neural networks are a package of different layers, in those layers the features of the training images are extracted and learnt by the net. There are different kinds of layers:

- Convolutional layer

- Pool layer

- non linearity

- Fully-Connected Layer

Each layer is integrated by a set of independent neurons. Each neuron is formed by the following elements:

- An input: the input could be a single input or a set of inputs.

- Weights: each input is associated with a weight

- Bias: the bias is an independent term which is associated with its neuron.

- Activation function

- An output