Using a convolutional neural network to classify the Street View House Number dataset

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Neural networks

Neural networks are a family of predictors characterized by the combination of simple computational units, called neurons. A neuron typically performs the following computation: $g(\boldsymbol{x}) = \sigma(\boldsymbol{\omega}^T \boldsymbol{x})$, where the elements of the vector $\boldsymbol{\omega}$ are the parameters of the neuron, σ is a non-linear function called activation function, and $\boldsymbol{x}$ is the vector $x_0, \ldots, x_n$ where $x_0 = 1$ and x_i for $i \in \{i, \ldots, n\}$ the output computed by another neuron. In the supervised learning setting, neurons are combined in a graph-like structure resulting in a computational network able to learn, by adjusting the parameters $\boldsymbol{\omega}$ of each neuron, the underlying mapping between data points and labels.

An example of a simple neural network is given by the on in Figure 1

The Street View House Number dataset

Model training

Results

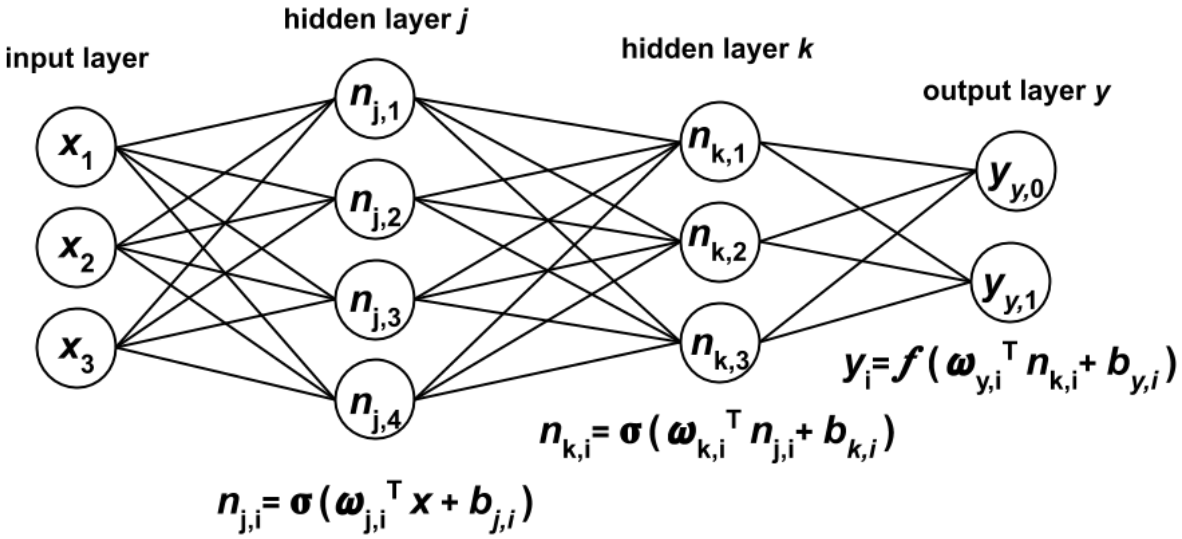

Figure 1: A simple example of a feedforward network