# SIGML

## SPECIAL INTEREST GROUP IN MACHINE LEARNING

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Title: Autoencoders
Speaker: Sharbatanu Chatterjee (Senior Undergraduate Student)
Day: October 6, 2015, Tuesday
Time: 5:00 PM
Venue: KD102 (CSE main)

Abstract

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An auto-encoder is basically a neural network, used in learning a compressed representation of an input, such that it can be reconstructed later. This means that the desired output of the auto-encoder is the auto-encoder input itself.

The simplest form of the auto-encoder (linear activation in a single hidden layer) would essentially involve Principal Component Analysis but we shall see that with different non-linearities in the hidden layer, the auto-encoder has the abilities to capture multi-modal aspects of the input distribution.

We shall then discuss the general issues with the auto-encoder and ways that it can be avoided. This would eventually lead to the relations of auto-encoders with RBM's (discussed thoroughly in the last meeting by Arnab) and to stacked auto-encoders as well as (hopefully) to certain variants of RBM's and auto-encoders - Denoising auto-encoders and sparsity in both RBM's and auto-encoders.

In the end, we shall discuss the successes of this technique and its use in several areas, particularly in areas like computational neuroscience.

The speaker has also requested to slightly familiarize
with the elements in just section 4.6 (Pg 45) of Bengio's book here :
http://www.iro.umontreal.ca/~bengioy/papers/ftml_book.pdf