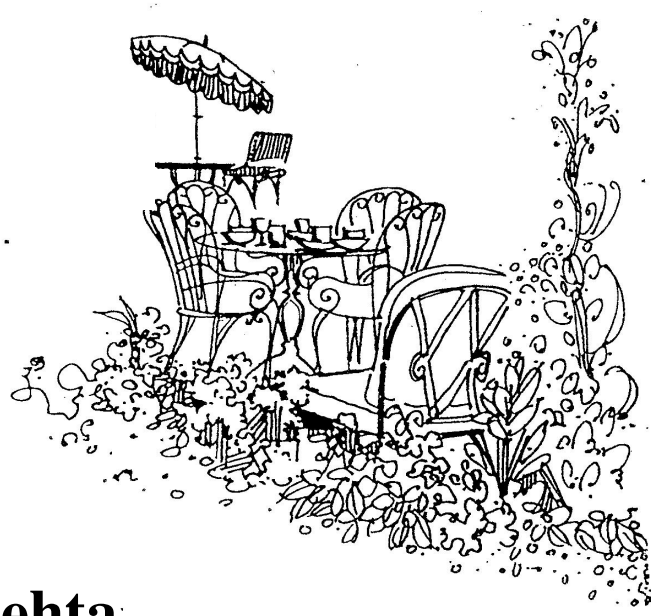
Chez Pierre

Presents ...

Monday, March 9, 2015
12:00pm
MIT Room 4-331



Pankaj Mehta
Boston University

"Deep Learning and the Variational Renormalization Group"

Deep learning is a broad set of techniques that uses multiple layers of representation to automatically learn relevant features directly from structured data. Recently, such techniques have yielded record-breaking results on a diverse set of difficult machine learning tasks in computer vision, speech recognition, and natural language processing. In this talk, I will give a "gentle" introduction to Deep Learning and show that deep learning is intimately related to one of the most important and successful techniques in theoretical physics, the renormalization group (RG). I will present an exact mapping from the variational renormalization group, first introduced by Kadanoff, and deep learning architectures based on Restricted Boltzmann Machines (RBMs) and illustrate these ideas using the nearest-neighbor Ising Model in one and two-dimensions.