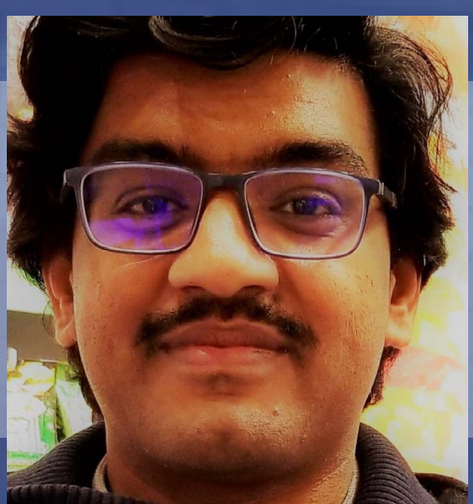
भारतीय प्रबंध संस्थान बेंगलूर
INDIAN INSTITUTE OF MANAGEMENT
BANGALORE

The Decision Sciences Area at IIM Bangalore welcomes you to a webinar, titled:

'Models of Locality in Neural Network Training Dynamics'

by
Dr. Anirbit Mukherjee,
University of Manchester



Date: 26th January, 2022
Time: 06:30 p.m. to 07:30 p.m.

Abstract:

One of the paramount mathematical mysteries of our times is to be able to explain the phenomenon of deep-learning. Neural nets can be made to paint while imitating classical art styles or play chess better than any machine or human ever and they seem to be the closest we have ever come to achieving "artificial intelligence". Trying to reason about these successes quickly lands us into a plethora of extremely challenging mathematical questions - typically about the discrete stochastic processes of the neural weights during training. But in this talk we will present an alternative recent approach towards understanding deep-learning which takes a phenomenological path rather than the usual microscopic approach.

We will review this very new concept of "local elasticity" of a learning process and propose a new definition for it adapted to classification scenarios. Via experiments on state-of-the-art nets we will demonstrate how our's as well as the original elasticity function appear to reveal certain universal phase changes during neural training. Then we will introduce different mathematical models which will reproduce some of these key properties in a semi-analytic way. We will end by delineating various open questions in this emergent theme of macroscopic approaches to deep-learning.

This is joint work with Soham De (UPenn, Computer and Information Science) and Phanideep Gampa (Amazon, India)