



THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering
Seminar

The four levels of fixed points in mean-field interacting particle systems

by

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Date : 18 May 2023 (Thursday)

Time : 11:00am to 12:00pm

Venue : Room 801, Ho Sin Hang Engineering Building, CUHK

Abstract

The talk will be on the mean-field limit of an interacting particle system. Many computer communication networks can be modeled as interacting particle systems where the state of each node (particle) evolves at a rate that depends on the states of the other nodes. Often, this rate is dependent on the states of the other nodes only through their empirical distribution, the so-called mean field. Examples include wireless local area networks, processor sharing queueing systems, malware propagation models, among many others. The fixed-point analysis is a useful technique that helps the analyst understand the system's equilibrium behaviour. One can identify four levels of fixed points that fix (1) the relationship between certain macroscopic observables of the system, (2) the equilibrium distribution over particle states, (3) the evolution of the mean-field over time, and (4) the law associated with the limiting Markovian evolution of a particle. The talk will highlight these four levels and how they are related to each other.

Biography

Rajesh Sundaresan is a Professor in Electrical Communication Engineering, an associate faculty in the Robert Bosch Centre for Cyber-Physical Systems, and the current Dean of the Division of EECS at the Indian Institute of Science. His research interests include decision theory, communication, computation, and control over networks, cyber-social systems, and, more recently, data-driven decision frameworks for public health responses.

**** ALL ARE WELCOME ****