ISyE Statistic Seminar - George Moustakides

Thursday, November 21, 2019 - 12:00pm to 1:00pm

Groseclose 402

Title:

Neural network estimation of likelihood ratios for testing and detection

Abstract:

Various problems in Statistics and Engineering require the computation of the likelihood ratio function of two probability densities. In classical approaches the two densities are assumed known or to belong to some known parametric family. We replace this requirement with the need for availability of data sampled from the densities of interest. For most well known problems in Detection and Hypothesis testing we develop data-driven solutions by providing neural network based estimates of the likelihood ratio or its transformations. This task requires the definition of proper optimizations which can be used for the training of the neural networks. The main purpose of this work is to offer a simple and unified methodology for defining such optimization problems with guarantees that the solution is indeed the desired function. Our results are extended to cover estimates of likelihood ratios of conditional densities and estimates of statistics encountered in local approaches.

Short Bio:

George V. Moustakides received the diploma in Electrical and Mechanical Engineering from the National Technical University of Athens, Greece in 1979, the MSE in Systems Engineering from the University of Pennsylvania in 1980, and the M.Sc and Ph.D in Electrical Engineering and Computer Science from Princeton University in 1983. Since 1988 he is with the University of Patras, Greece initially with the Computer Engineering and Informatics department and later with the department of Electrical and Computer Engineering. In 2017 he also joined the Computer Science department at Rutgers University. In the past he held various visiting or long-term appointments with INRIA France, Princeton University,

University of Pennsylvania, Columbia University, University of Maryland, Georgia Institute of Technology, University of Southern California, University of Illinois at Urbana-Champaign and Rutgers University. His interests include Sequential Detection, Statistical Signal Processing and Machine Learning. From 2011 to 2014 and from 2016 to 2018 he served as Associate Editor for the IEEE Transactions on Information Theory.