

SenSIP Seminar Series

Direct estimation of density functionals using a polynomial basis

Presenter: Alan Wisler

Postdoctoral Scholar at University of Canterbury

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Abstract

Density functionals play a critical role in a number of problems in machine learning, signal processing and information theory. In this talk, we will introduce a polynomial basis set that can be directly estimated by a novel k-nearest neighbor rule. Using convex optimization, we identify weighted combinations of these basis functions that can be used to approximate a range of density functionals such as Hellinger distance and KL-divergence, as well as to construct tighter bounds on the Bayes Error Rate (BER). Using some basic test cases, we analyze the performance of the proposed methodology relative to some common parametric and non-parametric alternatives.

Biography:



Alan Wisler received the B.S. and M.S. degrees in electrical engineering from the University of Texas at Dallas, Dallas, TX, USA, in 2011 and 2012, respectively, and the Ph.D. degree in electrical engineering from Arizona State University, Tempe, AZ, USA, in 2016. He is currently a Postdoctoral Fellow at the New Zealand Institute of Language, Brain, and Behavior. His research interests span a range of topics in machine learning, signal processing, and information theory. His current research is primarily focused on the study and development of nonparametric estimators and their applications to statistical learning challenges in speech

processing.

Refreshments

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