

Séminaire ICI : Malcolm Egan

05 Février 2018, 11:00 – 12:30

Titre du séminaire et orateur

Non-Gaussian Processes, Dynamic Interference, and the Capacity Map.

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Date et lieu

Lundi 5 février 2018, 11h.

ENSEA, salle 384.

Abstract

While Gaussian processes are ubiquitous in information theory and statistics, their use can be limited by exponentially decaying tails and limited dependence structure. For instance, they do not admit extremal lower tail dependence. As such, more general models can be desirable and a key example are the alpha-stable processes, which contain Gaussian processes as a special case. In this talk, I will present an example motivated by wireless communication in large-scale uncoordinated networks with fast varying active transmitter sets. The "dynamic" interference arising in this setting leads to the study of (vector) additive alpha-stable noise channels for which the capacity is challenging to characterize, particularly when practical receiver properties are accounted for. In order to obtain insights into the capacity for non-Gaussian noise channels, one approach is to focus on the capacity map. That is, the map from the noise distribution (or other channel parameters) to the capacity. We develop some methods based on the sensitivity analysis of optimization problems to study the capacity map and apply them to the alpha-stable noise channel.

Bio

[Malcolm Egan](#) received the B.E. degree in electrical engineering from the University of Queensland, Brisbane, Australia, in 2009 and the Ph.D. in electrical engineering from the University of Sydney, Sydney, Australia, in 2014. In the years 2014-2016, he was a Postdoctoral Researcher in the Department of Computer Science, Czech Technical University in Prague, Czech Republic and in the Laboratoire de Mathématiques, Université Blaise Pascal, Clermont-Ferrand, France. Between 2016-2017 he was a Postdoctoral Researcher in CITI Lab, INSA-Lyon, INRIA, Université de Lyon and joined the faculty as enseignant-chercheur in September 2017. He is an associate editor for IEEE Communications Letters and a guest editor for a forthcoming special issue on Molecular Communication Networks in IEEE Access. His research interests include optimization theory, mechanism design, information theory and statistical signal

processing, as well as their applications.

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