



THE CHINESE UNIVERSITY OF HONG KONG
Department of Electronic Engineering

SEMINAR

The T-Rex Selector: Fast High-Dimensional Variable Selection with False Discovery Rate Control

By

Jasin Machkour
Technische Universität Darmstadt, Germany

Date: 8 August, 2023 (Tuesday)

Time: 2:00 pm

Venue: Room 503, Yasumoto International Academic Park

Abstract:

Providing guarantees on the reproducibility of discoveries is essential when drawing inferences from high-dimensional data. For example, the development of personalized medicine relies on the reproducibility of genome-wide association studies (GWAS). This talk introduces the Terminating-Random Experiments (T-Rex) selector, a fast multivariate variable selection method for high-dimensional data. The T-Rex selector provably controls a user-defined target false discovery rate (FDR) while maximizing the number of selected variables. It scales to settings with millions of variables. Its computational complexity is linear in the number of variables, which makes the T-Rex selector more than two orders of magnitude faster than, e.g., the existing model-X knockoff methods. The easy-to-use open-source R package 'TRexSelector' is available on CRAN.

Biography

Jasin Machkour is a final year PhD student at the Technische Universität Darmstadt in Germany. His supervisors are Prof. Michael Muma and Prof. Daniel P. Palomar. He is a founding member of the EURASIP Student Committee and represents the area Theoretical and Methodological Trends in Signal Processing (TMTSP). He received the B.Sc. degree in Industrial Engineering and the M.Sc. degree in Electrical Engineering and Information Technology with a major in Communication and Sensor Networks from Technische Universität Darmstadt in 2016 and 2019, respectively. During his Master's studies and his PhD he was a visiting student at the University of Illinois at Urbana-Champaign (08/2016 - 05/2017), The Hong Kong University of Science and Technology (09/2019 - 02/2020 & 05/2023 - 08/2023), and Université Paris-Saclay (05/2022 - 07/2022). He works on developing methods/algorithms for large-scale and high-dimensional learning tasks with provable statistical properties that help advance genomics research, the development of personalized medicine, and drug development.

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For enquiries: Prof. W.K. Ma, email: wkma@ee.cuhk.edu.hk