

SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Faculty of Engineering

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Area: Communications & Network

Host: Assoc Prof Vincent Y. F. Tan

TOPIC	:	Optimal Localization Rate of Change-Point Detection with Training Sequences
SPEAKER	:	Ms He Haiyun Graduate Student, ECE Dept, NUS
DATE	:	Tuesday, 6 April 2021
TIME	:	3.30PM to 4.30PM
WEBINAR	:	Join Zoom Meeting https://nus-sg.zoom.us/j/9839098564

ABSTRACT

This paper investigates a novel offline change-point detection problem from an information-theoretic perspective. In contrast to most related works, we assume that the knowledge of the underlying pre- and post-change distributions can only be learned from training sequences, and we further require the probability of undetected error to decay either exponentially or sub-exponentially fast (corresponding to the large and moderate deviations regimes respectively in the information theory parlance). Our problem formulation finds a variety of real-life applications from detecting when the light switches between on and off to detecting when climate change occurred. Based on the training sequences as well as the test sequence consisting of a single-change, we design a class of change-point estimators based on the method of types, and further show that this class of estimators is optimal by establishing matching (strong) converses. This leads to a full characterization of the optimal localization rate (i.e. the normalized distance between the estimated and true change-points) as a function of the undetected error rate, under both the large and moderate deviations regimes.

BIOGRAPHY

He Haiyun is currently pursuing a Ph.D. degree in the Department of Electrical and Computer Engineering, National University of Singapore under the supervision of Assoc Prof. Vincent Tan. Her research interests include information theory, statistical learning theory and their applications.

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