Contribution ID: **103**   Type: **not specified**

Designing Optimal Tests for Sequential Detection of Changes

The on-line detection of a change in the statistical behavior of an observed random process is a problem that finds numerous applications in diverse scientific fields. The "Sequential Detection of Changes" literature addresses theoretically and methodologically the specific problem offering a rich collection of theoretical results and a multitude of methods capable of efficiently responding to different types of changes. The majority of the proposed detection strategies enjoy some form of (asymptotic) optimality according to well defined criteria. Unfortunately, these performance measures are notoriously complicated and have been the subject of long and intense discussions within the community as to which is more appropriate to adopt. In this talk by following a bottom/up logic we attempt to build proper performance criteria by first understanding and categorizing the mechanisms that can generate changes. Interestingly, through our analysis we rediscover the same criteria that were arbitrarily proposed in the literature only now we are at a position to identify the category of changes where each criterion is most suitable for. For each criterion we recall the corresponding optimal detection structure and we also discuss possible variations.

Special/ Invited session

Keynote

Classification

Mainly methodology

Keywords

Sequential Detection

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Track Classification: Keynote