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Bayesian Loss-based Approach to Change Point Analysis

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Abstract

A loss-based approach to change point analysis is proposed. In particular, the problem is looked from two perspectives. The first focuses on the definition of a prior when the number of change points is known a priori. The second contribution aims to estimate the number of change points by using a loss-based approach recently introduced in the literature. The latter considers change point estimation as a model selection exercise. The performance of the proposed approach it is shown on simulated data and real data sets.

Keywords: Change point; Discrete parameter space; Loss-based prior; Model selection.

1 Introduction

There are several practical scenarios where it is inappropriate to assume that the distribution of the observations does not change. For example, financial data sets can exhibit alternate behaviours due to crisis periods. In this case it is sensible to assume changes in the underlying distribution. The change in the distribution can be either in the value of one or more of the parameters or, more in general, on the family of the distribution. In the

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