MOSUM PROCEDURES FOR CHANGE POINT DETECTION

LIDIIJA DÂME

University of Latvia, Department of Mathematics
Zel̃lu iela 8, Riga LV-1002, Latvia
E-mail: lidija.dame@gmail.com

The change-point detection is the problem of discovering time points at which the properties of time-series data change. This covers a wide range of real-world problems in medicine, finance, genetics etc. Usually statistical inference about the change points has two aspects. The first is to detect if there is any change in the sequence of observed random variables. The second is to estimate the number of changes and their corresponding locations.

The class of MOSUM (moving-sum) statistics has been developed and analysed for many different kind of AMOC models. Hušková and Slabý [1] proposed to use the moving sum (MOSUM) statistics for the classical multiple change-point hypothesis in i.i.d. data. Consider the following moving sum statistic

\[ T_n(G) = \max_{1 \leq k \leq n-G} \frac{\left| T_{k,n}(G) \right|}{\tau}, \]  

where \( T_{k,n}(G) := \frac{1}{\sqrt{2G}} \left( \sum_{i=k+1}^{k+G} X_i - \sum_{i=k-G+1}^{k} X_i \right) \)

with a bandwidth \( G \) and a long-run variance \( \tau \). Hušková and Slabý [1] showed that under null hypothesis the test statistic (1) follows Gumbel extreme value distribution. C. Kirch and B. Muhsal [2] extended the previous results to dependent errors and analyzed the behaviour of the respective test statistics.

We will discuss MOSUM procedures of detecting change-points and compare them with some other known methods.

REFERENCES