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# MOSUM PROCEDURES FOR CHANGE POINT DETECTION

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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. Huškovà and Slabỳ [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

$$T_n(G) = \max_{G \le k \le n-G} \frac{\mid T_{k,n}(G) \mid}{\tau}, \tag{1}$$

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

with a bandwidth $G$ and a long-run variance $\tau$. Huškovà and Slabỳ [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**

[1] M. Huškovà, A. Slabỳ. Permutation tests for multiple changes. *Kybernetika*, **37** (5):605–602, 2001.

[2] C. Kirch, M. Muhsal. A MOSUM procedure for the estimation of multiple random change points. , Discussion paper, KIT.