Change-point analysis comprises various statistical tools which are employed for determining if and when a change in a data set has occurred. In the last two decades it has emerged as a relevant research topic especially in the econometric literature where the attention is paid to the detection of multiple change points in economic and financial time series. In case of multiple changes in mean Cappelli et al. (2008) have proposed a method called ART (Atheoretical Regression Trees) that employs regression trees to estimate the number and location of change points whereas in Cappelli et al. (2011) a straightforward extension of the ART procedure called Theoretical Regression Trees (TRT) is described that employs the recursive partitioning principle of regression trees for dating breaks in the coefficient of a parametric model considering the general framework of the liner model.

In this paper we describe how to conduct a change-point analysis when dealing with time ordered data that are measured on an ordinal scale. Indeed, in many real life situations we meet data that derive from human perception or expert judgment and sometimes the data are ordered sequences of observations and by definition time series. In case such as these change-point analysis is a useful tool for monitoring and control. In general, treating ordinal data as either numerical or categorical might entail loss of information or inaccuracy because judgments and evaluations are discrete measures of continuous latent variables and they are intrinsically accompanied by a vagueness (uncertainty) that needs to be properly taken into account. At this aim we consider a fuzzy coding i.e. the ordinal scale is converted into a fuzzy variable and, in order to estimate the number and location of change points of the fuzzified time series we employ, in the framework of ART, a deviance measure decomposition for fuzzy variables based on the approach of Yang and Ko (1996) proposed by D’Urso and Santoro (2006). The proposal is illustrated by applications to both simulated and real data.


