

## A Framework Based on Dempster-Shafer Theory of Evidence Algorithm for the Analysis of the TV-Viewers' Behaviors

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**Abstract :** In this paper, we propose an approach of detecting the behavior of the viewers of a TV program in a non-controlled environment. The experiment we propose is based on the use of three types of connected objects (smartphone, smart watch, and a connected remote control). 23 participants were observed while watching their TV programs during three phases: before, during and after watching a TV program. Their behaviors were detected using an approach based on The Dempster Shafer Theory (DST) in two phases. The first phase is to approximate dynamically the mass functions using an approach based on the correlation coefficient. The second phase is to calculate the approximate mass functions. To approximate the mass functions, two approaches have been tested: the first approach was to divide each features data space into cells; each one has a specific probability distribution over the behaviors. The probability distributions were computed statistically (estimated by empirical distribution). The second approach was to predict the TV-viewing behaviors through the use of classifiers algorithms and add uncertainty to the prediction based on the uncertainty of the model. Results showed that mixing the fusion rule with the computation of the initial approximate mass functions using a classifier led to an overall of 96%, 95% and 96% success rate for the first, second and third TV-viewing phase respectively. The results were also compared to those found in the literature. This study aims to anticipate certain actions in order to maintain the attention of TV viewers towards the proposed TV programs with usual connected objects, taking into account the various uncertainties that can be generated.

**Keywords :** Iot, TV-viewing behaviors identification, automatic classification, unconstrained environment

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