Review: Mining Recent Temporal Patterns for Event Detection in Multivariate Time Series Data

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Summary  Iyad Batal et. al. in the paper ”Mining Recent Temporal Patterns for Event Detection in Multivariate Time Series Data” proposed a pattern mining approach for multivariate health data time series which is then used for classification and prediction of diseases. To extract the patterns, they assigned a fuzzy value in time intervals instead of numerical values for each variable. Then, they concatenated several time series of fuzzy values into one sequence which preserved the value of variables rather than aggregating into one value. The authors used this new presentation of the data to mine the recent patterns and fed their classifier. Their results presented the efficiency and accuracy of their method.

Positive Points  The paper proposes an interesting way of combining the information from several time series without aggregating them at each time point which preserves the temporal correlation of the variables to each other.

Negative Points

1. The paper does not evaluate the proposed classification method by comparing it to other existing methods. The reason they provide is merely because of time inconsistency and gaps in data collection of different variables. This reason is not acceptable, since it might have been possible to either
extract a consistent range or modify previous methods to work with this data.

2. The compared methods in the paper outperform each other insignificantly in each disease study. Recent patterns which is the main focus of the work improves the results by less than 1%. The paper also lacks a general study of the all diseases.

Discussion Points and Questions

1. Several interesting features of time-series could be used to learn more about the changes of each variable or correlations of variables over time. It seems this paper is more concerned about their contribution which includes recent patterns and does not get advantage of previous methods.

2. The work could study the the effect of different time length for recognizing a pattern as recent.