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**DETECTING REGIONS OF MAXIMAL DIVERGENCE FOR SPATIO-TEMPORAL ANOMALY DETECTION**

**ABSTRACT:**

Automatic detection of anomalies in space- and time-varying measurements is an important tool in several fields, e.g., fraud detection, climate analysis, or healthcare monitoring. We present an algorithm for detecting anomalous regions in multivariate spatio-temporal time-series, which allows for spotting the interesting parts in large amounts of data, including video and text data. In opposition to existing techniques for detecting isolated anomalous data points, we propose the “Maximally Divergent Intervals” (MDI) framework for unsupervised detection of coherent spatial regions and time intervals characterized by a high Kullback-Leibler divergence compared with all other data given. In this regard, we define an unbiased Kullback-Leibler divergence that allows for ranking regions of different size and show how to enable the algorithm to run on large-scale data sets in reasonable time using an interval proposal technique. Experiments on both synthetic and real data from various domains, such as climate analysis, video surveillance, and text forensics, demonstrate that our method is widely applicable and a valuable tool for finding interesting events in different types of data.