SYNOPSIS

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The data here is the anomalous time series, which can possibly be a univariate, or a multivariate time series. If it were to be a normal time series, we witness a change periodically, but in anomalous time series, the change is not periodic. Here, we are trying to achieve an almost periodic anomalous time series, that provides information of the occurrence of an anomaly. Considering the data from aircraft, or the factory machineries, we have data coming in from different sensors simultaneously, resulting in a multivariate time series. The idea is to first convert this multivariate time series to univariate time series. It is achieved by calculating the principal components of certain time intervals (blocks or windows of time), and using them to calculate the angle between the subspaces. This results in a univariate time series data, that is further subjected to various techniques of anomaly detection. A technique of windows-based anomaly detection is used, where the subspace-based transformation (univariate to multivariate, then to another kind of univariate time series) is performed, and application of anomaly detection techniques gives us the points where the possible anomalies could have occurred.