**Multivariate Time Series Classification With Deep Learning**

**Abstract**

Time Series Classification(TSC) has emerged as one of the most difficult problems in Data Science in recent years. This is because any classification problem that uses data while analyzing some separating idea can be treated as a Time Series Classification problem. Time series can be found in a wide range of real-world applications, including health care, human activity recognition, cyber-security, finance, marketing, automated disease detection, anomaly detection, and so on. As the availability of temporal data has increased significantly in recent years, many areas have developed a strong interest in time series-based applications, and many new algorithms have been proposed as a result.TSC is fundamentally a supervised machine learning problem, where you train several algorithms on time series data, then observe which algorithm works best. Over the past years, research on TSC has developed new algorithms which have made a major impact on the current state of the art. A TSC problem is a classification problem where the objects of the datasets are univariate or multivariate time series. Our main focus is on the Multivariate time series classification(MTSC) because it is more common to encounter multivariate TSC problems, considering this MTSC has received less attention than the univariate case. The UCR and UCI archives have provided datasets that include univariate as well as multivariate time series problems. Of all the algorithms in this field, especially algorithms based those based on deep learning require some kind of feature engineering, selection of learning rate, and choice of batch size as a separate task. By performing these tasks we will be improving the performance of the existing deep learning algorithms.