**TSFRESH data --- a library to manipulate features for data science**

**Notes for Master’s Thesis**

<https://www.xenonstack.com/blog/time-series-forecasting-machine-deep-learning/>

1/ Time series problem.

Time uni variant and time multi variant

### **ARCH/GARCH Model**

Univariate GARCH models have achieved fame in volatility models, but Multivariate GARCH is still very challenging to implement in the time series.

### **Questions to be asked about Data**

* How fast are we getting the data? (once in a second, minute, hour).
* Are all the sensors giving data at the same time or different sensors giving data at different times?
* Are the values of the sensors related or independent?
* To predict one’s future value, should we consider all the past data or the latest subset enough? If we are considering, just a subset, how much data is good enough for future predictions?

### **Multivariate Model With VAR and Deep Learning**

In VAR model, we need not consider converting the data to the supervised learning problem. We can directly use the VAR model to predict future values of the required column.

In Deep Learning approach, we require the values of the independent variables. VAR model cannot handle huge data at a time whereas deep learning architecture is better at the performance.