The article I reviewed is titled “Apply “Ready-to-Use” Machine Learning to Improve Industrial Operations” (<https://www.electronicdesign.com/industrial-automation/apply-ready-use-machine-learning-improve-industrial-operations>). In modern times when one hears machine learning the first thing they think about is the utilization in applications such as Alexa or Siri, and photo recognition in Facebook’s algorithms. Industrial Operations, on the other hand, pose other challenges. The data received from these operations can be convoluted and generally very complex. This data comes from operational systems that produce streams or bursts of time series data in the forms of sensor readings or logs. This data can be used to summarize or predict the general health (in this case heath is used to define expected output) of the production line or whatever system the data came from.

Historically, this data has been underutilized. Current methods of analysis tend to fall short of ideal because there are many sources of data from along the line. There can be hidden signals that can be easily missed. Three elements of time series need to be fully appreciated to properly analyze the date: patterns are temporal, patterns are multivariate, and patters are complex and need to be discovered.

Machine learning tactics applied to time series are far more complicated than a ‘slice in time’ analysis, such as MNIST image recognition. If we incorporated handwriting over a significant period of time or even including other dialects’ numerics, it could cause lots of issues for a final network! Specific problems with temporal analysis include the interpretation of complex multivariate signals and feature extraction, limitations to labeling known behaviors, ease of use for other operational teams, and the support of real time streaming analysis.

A main requirement for machine learning in operational purposes could be to have an “early warning signal” for machine failures. This requires a machine learning algorithm to take in live data and determine what signals to interpret as impending fault or failures. Industrial organizations are starting to use these machine-learning systems to optimize all of their operations. These operations are very sensitive to downtown and poor production. This downtime can cause vast amounts of money for companies and if the problem persists it can cause a company to fail. Future need and development of these time series machine learning are all but necessary to keep our infrastructure in place and keep production in line with continued market growth.