Manual: 6. Intelligent Soft Sensor (ISS)

Sometimes it is difficult or expensive to measure a quantity of interest by a sensor installed in the process. In that case, we might opt to measure it manually by a hand-held sensor, a portable devise or by taking a sample and having it investigated in the laboratory. This manual process becomes tedious and expensive in its own right after some time. Additionally, the value only becomes available when we perform this process and even then only with a delay.

A soft sensor is a piece of software intended to replace the manual measurement process by computation. The value is available in real-time without making any manual effort. This can be used to compute process efficiency, gas chromatography, pollutants or any other quantity hard to measure.

The soft sensor is a essentially a formula that computes the quantity of interest from other quantities that can be measured in the normal way. The formula itself is determined using machine learning from the data collected by hand. First, the computer determines which process values are necessary to compute the interesting one. Second, the data is collected and a model is trained. Then the model quality can be checked and the model can be improved, if necessary. Once the model is good, it can be deployed computationally in order to look just like any other sensor.