sensors

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Special Issue Reprint

Intelligent Soft Sensors

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This Special Issue deals with the field of intelligent soft sensors that enable the online estimation of nonmeasurable process variables. Soft sensors or virtual sensors are common names for software algorithms in which multiple measurements are processed together. Typically, soft sensors are based on control theory and are also referred to as state observers. There may be dozens or even hundreds of measurements from hard sensors (big data). The interaction of signals can be used to compute new quantities that cannot be measured directly online or are difficult and expensive to measure. Soft sensors are particularly useful in data fusion, combining measurements of different characteristics and dynamics. They can be used for fault diagnosis (self-analysis, self-calibration, and self-maintenance) as well as for control applications. Well-known software algorithms that can be seen as soft sensors include, for example, Kalman filters. More recent implementations of soft sensors use neural networks, fuzzy logic, models based on evolving clustering, partial least squares, etc. In the digitized factories of the future, intelligent sensors represent one of the core building blocks for automating and optimizing production, as they make production more efficient in every respect.

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