■ 연구논문 요약문1

논문제목	Fault Detection and Diagnosis Using Self-Attentive Convolutional Neural Networks for Variable-length Sensor Data in Semiconductor Manufacturing
게재정보	IEEE Transactions on Semiconductor Manufacturing, 32(3), 2019
개요	- 연구 목적과 내용에 대해 소개 (서술식으로 작성해도 됨) - Nowadays, more attention has been placed on cost reductions and yield enhancement in the semiconductor industry. During the manufacturing process, a considerable amount of sensor data called status variables identification (SVID) is collected by sensors embedded in advanced machines. This data is a valuable source for data-driven automatic fault detection and diagnosis at an early manufacturing stage to maintain competitive advantages. However, wafer processing times vary slightly from wafer to wafer, resulting in variable-length signal data. The conventional approaches use much condensed data called fault detection and classification (FDC) data made by manually designed feature extraction. Or, recent deep learning approaches assume that all wafers have the same processing time, which is impotent to the variable-length SVID. To detect and diagnose faults directly from the variable-length SVID, we propose a self-attentive convolutional neural network.
연구결과	- 연구개발 결과를 가능한 한 비전문가가 이해할 수 있도록 설명 (서술식으로 작성해도 됨) - In experiments using real-world data from a semiconductor manufacturer, the proposed model outperformed other deep learning models with less training time and showed robustness at different sequence lengths. Compared to FDC data, SVID data showed better fault detection performance. Without manually investigating the lengthy sensor signals, abnormal sensor value patterns were found at the time specified by the model. - Index Terms—Fault detection, fault diagnosis, variable-length signal classification, raw sensor data, self-attentive convolutional neural networks, semiconductor manufacturing.
활용분야 및 기대효과	- 연구개발 결과의 활용 분야와 기대 효과를 서술 (서술식으로 작성해도 됨) - Due to the model proposed in the paper, semiconductor manufacturing data analysis can take advantage of status variables identification (SVID), opening door to better understanding on what is actually going on in the chambers.