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Machine Learning Approach for Yield Prediction in Semiconductor Production

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Abstract : This paper presents a classification study on yield prediction in semiconductor production using machine learning approaches. A complicated semiconductor production process is generally monitored continuously by signals acquired from sensors and measurement sites. A monitoring system contains a variety of signals, all of which contain useful information, irrelevant information, and noise. In the case of each signal being considered a feature, "Feature Selection" is used to find the most relevant signals. The open-source UCI SECOM Dataset provides 1567 such samples, out of which 104 fail in quality assurance. Feature extraction and selection are performed on the dataset, and useful signals were considered for further study. Afterward, common machine learning algorithms were employed to predict whether the signal yields pass or fail. The most relevant algorithm is selected for prediction based on the accuracy and loss of the ML model.

Keywords : deep learning, feature extraction, feature selection, machine learning classification algorithms, semiconductor production monitoring, signal processing, time-series analysis
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