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## Partial M-quantile Regression for Predictive Maintenance

In Industry 4.0 factories, innovative prediction tools are adopted so that data can be systematically processed into information that can explain uncertainties and support decisions. Predictive manufacturing systems begin with acquiring data from monitored assets using appropriate sensors to extract various signals. These signals can then be integrated with historical data into extensive datasets containing a multitude of variables. Consequently, addressing the challenge of reducing dimensionality becomes of paramount importance. Dimension reduction techniques such as partial least squares (PLS) have recently gained attention to deal with the problem of big datasets with a large number of correlated variables. Standard PLS approaches confine the estimation to examining only average effects, resulting in an insufficient portrayal. In this paper, we combine the standard PLS technique with M-quantile regression. The proposed approach aims at offering a more comprehensive view of the effect of various dimensions on the degradation of etching equipment in the microchip fabrication process.

### Type of presentation

Talk

### Classification

Both methodology and application

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Partial Least Square, High Dimensional Data, Microelectronics

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