Lam Research, headquartered in Silicon Valley, California, employs more than 16,000 people worldwide and is a leading supplier of semiconductor manufacturing equipment. Lam's wafer fabrication equipment and services allows chipmakers to build smaller, faster, and better performing electronic devices. It's why nearly every advanced chip today is built with Lam Research technology. In Villach, Lam Research employs more than 700 people for the development and manufacturing of wafer cleaning equipment.

Join and help us addressing latest challenges we face and enhance our tools performance. Therefore, we announce a master thesis around control loop development focusing on:

Sensor Fault Detection and Isolation for Silicon Wafer Manufacturing Tools

Feedback control systems require inputs coming from one or several sensors measuring all kinds of physical quantities. Not only the quality of the measured data but also the reliability of the used sensors is of crucial importance for the performance of the closed-loop system. Sensor fault detection, a vivid subfield of control theory, aims to find methods capable of detecting, identifying and isolating faults of sensors in control systems.
LAM Research Corporation is an equipment supplier for the semiconductor industry. The tools produced by LAM Research are used in certain sections of wafer (silicon disk) processing such as adding components (e.g., transistors or capacitors) or wiring them. The site in Villach is specialized in developing tools used for cleaning wafers. For producing such high precision tools, tight control of the involved process variables and control loop reliability is key. Therefore, sensor reliability and sensor fault detection are important topics and recent advances in research in this field are of great interest for LAM Research.

Problem Statement

Establish a methodological hierarchy of the most important state-of-the-art methods which compares the individual methods based on different criteria such as performance, application areas etc. Use the gained knowledge to find a suitable method which can be applied to selected process control loops in LAM Tools.

Approach/Strategy

Start by performing a literature study on sensor fault detection and summarize the findings and comparisons in order to establish a good understanding of the requirements, advantages, disadvantages, application areas etc. of the different existing methods (or categories of methods).

Organizational Details

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