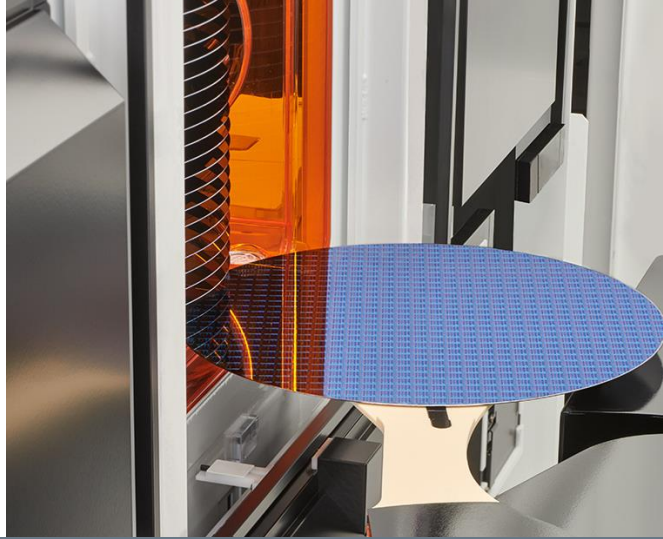


## Fault Detection and Isolation *for Silicon Wafer Manufacturing Tools*



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Fault detection is crucial in control engineering applications, ensuring reliability, safety and high performance of complex systems.

**This thesis** investigates advanced techniques capable of detecting and isolating sensor faults in process control systems implemented in wafer manufacturing tools.

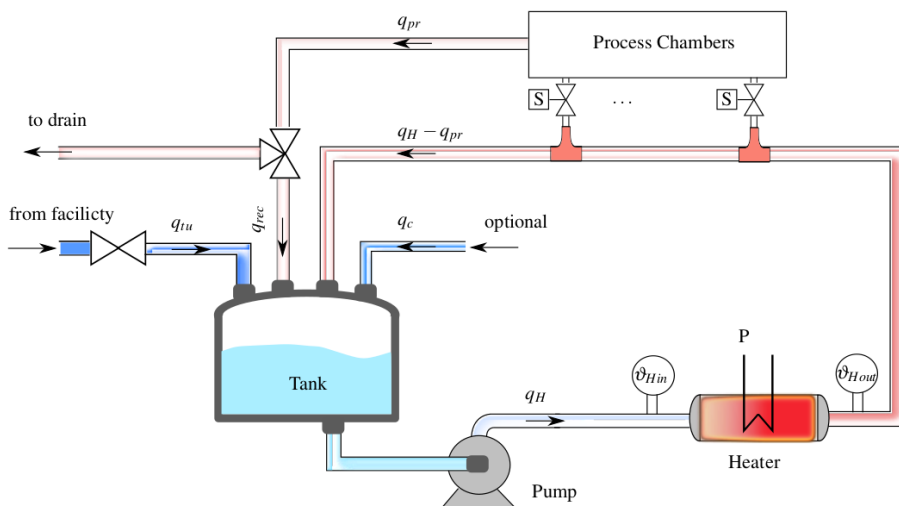
Focus Areas:



- **Model-based techniques** utilizing observers such as a Kalman filter or sliding mode-based observers
- **Data Driven approaches** applying machine learning and AI to analyze measurement data for fault prediction
- **Robust control techniques**, e.g. adaptive strategies that guarantee stability in the presence of a sensor fault

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*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.*



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