**Transforming Manufacturing Industry from Automation to Intelligenization with Industry 4.0/5.0 Technologies**

Industry 4.0/5.0 intends to address a fast-changing and challenging manufacturing environment with diverse demands, short order lead-time and product life cycle, limited capacities, and highly complex process technologies. A manufacturing system integrated with Industry 4.0/5.0 technologies, such as AI, machine learning, big data analytics, digital twin, Internet of Things, and Internet of Behaviors is capable of performing real-time monitoring and optimization of manufacturing processes in various aspects from high level strategic resource and production planning down to real-time equipment-level smart dispatching and predictive maintenance. By fully using real-time data and AI, the system is able to help manufacturers shorten production and R&D processes, increase production capacity, reduce production cost, guarantee product quality, and improve product yield. It is suitable to help not only high-tech industries such as semiconductor wafer fabrication, but also conventional labor-intensive sectors. This talk illustrates the transformation of semiconductor manufacturing activities from automation to intelligenization by using Industry 4.0/5.0 technologies through real-life wafer fabrication applications.