NEWS

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Supporting UMC's digital transformation: NYCU develops a semiconductor capacity planning system to optimize production operations efficiency

Vice President Francia Hsu (2nd from left) and Senior Director Stan Chen (1st from left) of UMC signed the agreement together with Professor Yung-Chia Chang (2nd from right) and Professor Sheng-I Chen (1st from right) of IEM at NYCU

Translated by Yen-Chien Lai

National Yang Ming Chiao Tung University (NYCU) conferred an In February, the Department of Industrial Engineering and Management (IEM) at National Yang Ming Chiao Tung University (NYCU) and the semiconductor giant United Microelectronics Corporation (UMC) conducted a signing ceremony for their industry-academia collaboration, declaring their joint development of a semiconductor cross-fab capacity planning optimization system. This system will automatically integrate capacity data from different UMC fabs and various equipment, aiming to assist UMC in identifying the most efficient capacity planning, thus becoming a pivotal aspect of UMC's digital transformation efforts.

According to the industry-academia collaboration agreement, this partnership will fully leverage and integrate the research resources and expertise of the Department of Industrial Engineering and Management, along with UMC's practical experience in the semiconductor manufacturing field. It aims to incorporate optimization methods into the new capacity planning system, aiming to identify capacity planning solutions that meet customer demands while maximizing production operational efficiency.

Driving Technological and Managerial Innovation in the Semiconductor Industry

Professor of IEM and project principal investigator (PI) Yung-Chia Chang stated that Taiwan has maintained a leading position in the semiconductor industry worldwide. Apart from outstanding research and development capabilities, Taiwan's strength lies in its production management planning and execution abilities, which are critical competitive advantages. This collaboration aims to develop a flexible and user-friendly capacity planning system to assist UMC in executing cross-fab capacity planning more efficiently, ensuring the fulfillment of customer demands.

Professor Sheng-I Chen, project co-PI, stated that the semiconductor industry involves a variety of products with small quantities and complex, time-consuming manufacturing processes. Cross-fab capacity planning requires consideration of multiple data dimensions, making it challenging to efficiently solve and identify the optimal capacity planning under various constraints.

UMC's Vice President of Corporate Operations Planning, Francia Hsu, expressed that UMC must continuously enhance operational efficiency through digitization and intelligence in the highly competitive global semiconductor environment. She looks forward to jointly developing an optimized capacity planning system with the Department of Industrial Engineering and Management at NYCU. Besides bringing tangible application benefits to UMC, such a system can also nurture talents in the industrial engineering field for the industry.

Overall, this industry-academia collaboration project will advance technological and managerial innovation in the semiconductor industry. It will provide substantial opportunities for collaboration between academia and industry, foster talent in the semiconductor industry and promote sustained development and innovation within the sector.

A group photo of the signing ceremony between UMC and IEM.

Related Image(s)：

UMC signed the agreement with IEM at NYCU.

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