Special Seminar
“Paths from MEMS Research to Products” and
“Emerging Opportunities in Microelectronics Leadership”

Organizer: Micro/Nano Machining Research and Education Center (MNC)
S. Tanaka Laboratory, Tohoku University
Date/Time: 18 April 2025, 16:30-18:00
Room: MNC 3F Seminar Room

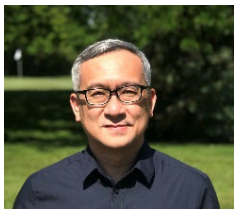
Lecturer: Dr. Wan-Thai Hsu, Chief Technology Officer, Soundskrit

Dr. Wan-Thai Hsu received a Ph.D. in Electrical Engineering and an MBA from the University of Michigan. Over the past 25 years, his work in MEMS has been recognized globally, earning him prestigious awards, such as the EE Times ACE Innovator of the Year Award (2007), Wall Street Journal Innovation Award (2007), and IEEE CB Sawyer Award (2015). He has held various positions of critical importance in startups as well as publicly traded companies, including CTO of Discera, CTO of MEMS at Micrel (now Microchip), CTO of TXC, CEO of Siliconquartz, and Chairman of the Board at Stathera. He is a senior member of IEEE, chaired the annual IEEE Frequency Control Symposium in 2014 and the decennial IEEE UFFC Joint Symposium in 2024. Currently, Dr. Hsu is the Chief Technology Officer at Soundskrit, which aims to develop bio-inspired MEMS audio systems to provide the capability not only to capture sound with high quality, but also to distinguish sound localization. Soundskrit was named the top 100 startups to watch by EE Times in 2023 and 2024 consecutively.

Dr. Dana Weinstein, Professor, Purdue University

Dana Weinstein is a Professor in Purdue’s Elmore Family School of Electrical and Computer Engineering. Prior to joining Purdue in 2015, Dr. Weinstein was a Professor at MIT in the Department of Electrical Engineering and Computer Science. She received her B.A. in Physics and Astrophysics from UC Berkeley in 2004 and her Ph.D. in Applied Physics in 2009 from Cornell. She is a Purdue Faculty Scholar, and a recipient of IEEE UFFC Sawyer Award, the NSF CAREER Award, the DARPA Young Faculty Award, the first Intel Early Career Award, the first TRF Transducers Early Career Award, and the IEEE IEDM Haken Award. Dr. Weinstein’s research focuses on innovative microelectromechanical devices for applications ranging from MEMS-IC wireless communications and clocking to harsh environment sensors and ultrasonic stimulation. Professor Weinstein has served as Associate Director for Purdue's Birck Nanotechnology Center, as Associate Dean in the College of Engineering at Purdue, and most recently as Principal Assistant Director and Special Advisor for Microelectronics Research and Development at the White House Office of Science and Technology Policy in DC. In that role, she is also a champion for accelerating materials innovation through autonomous experimentation.

Lecture #1
“Paths from MEMS Research to Products”



Wan-Thai Hsu, PhD, MBA
Chief Technology Officer, Soundskrit, Montreal, Quebec, Canada

Abstract

Micro-Electro-Mechanical Systems (MEMS) is a multi-discipline research area that combines electronics, mechanics, process technologies, and materials science, enabling the creation of micro-scale devices for vast variety of applications like healthcare, automotive, navigations, and consumer electronics. The transition from MEMS research to market-ready products also involves a multi-faceted journey combining innovation, scalability, and practical applications, and most importantly a strong heart of founders. The process requires overcoming challenges in design, fabrication, and integration, while ensuring cost-effectiveness and reliability. This path highlights the importance of collaboration not only between professionals with different background, but also between academia, industry, and government. Ultimately, translating MEMS research into products demands a balance of cutting-edge exploration and market-driven strategies.

The presenter will share his extensive experiences of making MEMS research to real world products – all the way from idea creation, research with universities, defining products, fund raising, designs, manufacturing, sales and marketing, to exiting the company by selling or IPO, with the hope to help MEMS researchers prepare for their next adventures.

Bio

Dr. Wan-Thai Hsu received a Ph.D. in Electrical Engineering and an MBA from the University of Michigan. Over the past 25 years, his work in MEMS has been recognized globally, earning him prestigious awards, such as the EE Times ACE Innovator of the Year Award (2007), Wall Street Journal Innovation Award (2007), and IEEE CB Sawyer Award (2015). He has held various positions of critical importance in startups as well as publicly traded companies, including CTO of Discera, CTO of MEMS at Micrel (now Microchip), CTO of TXC, CEO of Siliconquartz, and Chairman of the Board at Stathera. He is a senior member of IEEE, chaired the annual IEEE Frequency Control Symposium in 2014 and the decennial IEEE UFFC Joint Symposium in 2024.

Currently, Dr. Hsu is the Chief Technology Officer at Soundskrit, which aims to develop bio-inspired MEMS audio systems to provide the capability not only to capture sound with high quality, but also to distinguish sound localization. He leads the overall product development, manufacturing, packaging, and production testing to actualize high performance MEMS directional microphones and modules. Soundskrit therefore was named the top 100 startups to watch by EE Times in 2023 and 2024 consecutively. He often says, “the process of converting pure ideas to something that people can benefit from is exciting and rewarding.” Dr. Hsu’s passion, wisdom, and hard work have inspired many to follow his path to success.

Lecture #2
“Emerging Opportunities in Microelectronics Leadership”

Dana Weinstein, PhD
Professor, Purdue University, West Lafayette, Indiana, USA

Abstract

The semiconductor community is facing a pivotal opportunity with unprecedented investments and widespread recognition of the need for leap-ahead technologies. New materials, device architectures, and heterogeneous systems are now sought with a low-barrier path to adoption by the industry. Microelectromechanical Systems (MEMS) provide important and unique functionality for the CMOS+X roadmap, coupled with leadership in advanced packaging innovation. How can transducers leverage existing and emerging semiconductor platforms? How can we boost performance and create new capabilities with strategic materials and devices? These questions are considered in the context of accelerating translation to production with sustainable solutions.

Bio

Dana Weinstein is a Professor in Purdue’s Elmore Family School of Electrical and Computer Engineering. Prior to joining Purdue in 2015, Dr. Weinstein was a Professor at MIT in the Department of Electrical Engineering and Computer Science. She received her B.A. in Physics and Astrophysics from UC Berkeley in 2004 and her Ph.D. in Applied Physics in 2009 from Cornell. She is a Purdue Faculty Scholar, and a recipient of IEEE UFFC Sawyer Award, the NSF CAREER Award, the DARPA Young Faculty Award, the first Intel Early Career Award, the first TRF Transducers Early Career Award, and the IEEE IEDM Haken Award. Dr. Weinstein’s research focuses on innovative microelectromechanical devices for applications ranging from MEMS-IC wireless communications and clocking to harsh environment sensors and ultrasonic stimulation. Professor Weinstein has served as Associate Director for Purdue’s Birck Nanotechnology Center, as Associate Dean in the College of Engineering at Purdue, and most recently as Principal Assistant Director and Special Advisor for Microelectronics Research and Development at the White House Office of Science and Technology Policy in DC. In that role, she is also a champion for accelerating materials innovation through autonomous experimentation.