



MEMS & Sensors Technical Congress Highlights Automotive Market, Emerging MEMS Technologies

By Heidi Hoffman, senior director, technology community marketing, SEMI

This year's [MEMS & Sensors Technical Congress \(MSTC\)](#), February 19-20, 2019, features a deep dive into the changing automotive sensor landscape, a look at emerging MEMS technologies, and an exploration of integration standards. The more technically focused of SEMI's annual MEMS events, MSTC returns to Monterey, California, in conjunction with [FLEX](#), the conference that highlights new form factors enabled by advances in flexible, printed and hybrid electronics.



What's next for automotive sensors

Leading technologists from across the automotive sensor value chain will share their views on emerging opportunities and challenges in that rapidly evolving market. **Ford Motor Co.** Executive Technical Director, Palo Alto Research Center, Dragos Maciuca will give an update on the changing demands of the market in his keynote. Another keynoter, **ON Semiconductor** CTO Hans Stork will focus on recent developments in sensors and integration technology, and the remaining challenges to integrate these complex data streams into cost-effective intelligent sensor fusion.

PNI Sensor President & CEO Becky Oh will report on advancements in smart parking sensor solutions and their deployment in smart cities. **Verizon** Product Manager Nancy Ranxing Li will introduce Verizon's data-driven approach to reduce injury and death in traffic accidents. Featuring an integrated sensor system that detects and analyzes conflicts among pedestrians, vehicles and cyclists, the Verizon system identifies potentially dangerous situations at intersections. Cities can use the data to make changes to improve safety while 5G-enabled self-driving cars can use the data to prevent accidents. **Fabu** Head of Marketing Angela Suen will discuss Fabu's experience in applying machine learning to sensor integration data. **Analog Devices** GM, Inertial Sensors, Tony Zarola will address nuances of autonomous transportation, including maintaining navigation assistance when vehicle sensors "go blind" as well as vehicle health-monitoring.

Emerging MEMS technologies

Other sessions feature major MEMS makers and researchers sharing innovations on a wide range of technology challenges: from reducing power consumption and increasing intelligence in sensors to MEMS motors, analog in-memory computing, and human/electronics interfaces.

UC Berkeley Professor Kristofer Pister will introduce the next generation of low-power wireless sensor networks, which now featuring self-contained power, MEMS sensors, microwatt computation and communication hardware. Now being demonstrated at UC Berkeley, the ultra-high-reliability devices offer the 10ms latency suitable for factory automation. Pister will also discuss ultra-efficient MEMS motors for wirelessly controlled haptics as well as micro robots for precision manipulation.

Syntiant Corp. VP of Product Mallik Moturi will report on the company's neural decision processors, which use analog in-memory computing for ultra-low-power parallel processing. The company says that the devices are being designed into multiple kinds of edge devices, particularly for always-on speaker identification and key-word spotting for under 40 μ W—reportedly 50-100X more efficient than a GPU.

STMicroelectronics Senior Manager, MEMS, Jay Esfandyari will discuss how the integration of logic into MEMS inertial measurement units (IMUs) enables independently programmable gesture recognition algorithms on the IMU – enabling a range of motion-detection gestures at a fraction of the power of running the algorithms on an external microcontroller. **InvenSense** CTO Peter Hartwell will share his company's vision of the future in which sensors bridge the real and virtual worlds. **Arm** Senior Product Manager Tim Menasveta will explore Arm's work in extending machine learning to resource-constrained embedded devices.

Georgia Tech Research Fellow Yun-Soung Kim will present a new wireless skin-like electronics platform for persistent human-machine interfaces. The platform — SKINTRONICS — combines thin-film processes, soft material engineering and miniature chip components to adapt electronics that conform to the soft, curvilinear and dynamic human body. Georgia Tech researchers have demonstrated using SKINTRONICS-enabled wireless human-machine interfaces to send electrical signals from the human body to control remotely a car and a wheelchair.

In the area of improving manufacturing technology and standards, **Siemens/Mentor** GM Greg Lebsack will discuss the challenges and opportunities of co-design of MEMS and ICs for a more robust system and faster time to market. Lebsack will look at the design flow and the ecosystem of mixed-signal design tools and IP blocks for innovative system solutions for the IoT. **NIST** Project Leader Michael Gaitan will discuss improved test protocols for tri-axis MEMS accelerometers that better determine cross-axis sensitivities and are less sensitive to misalignment of devices on the test equipment, promoting more accurate testing in laboratory comparisons. **Intel** Platform Manager Ken Foust will discuss the impact and future of the MIPI I3C standard — a two-wire interface developed to address many key pain-points universally felt by system developers struggling to integrate broad sensor capability into their platforms.

MSTC is organized by [MEMS & Sensors Industry Group](#), SEMI technology community.



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