SMARTx - SMART Mobility

A revolution in Smart Factory is coming – driven by Autonomous, SW-defined, Service-oriented, Fully Connected Cars. Are you ready?

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Abstract
In this session we will discuss the rise of electronics in vehicle design, from Advanced Driver Assistance Systems and Autonomous Driving (ADAS / AD) through electrification and ultimately the connected, SW-defined car – focusing on how Smart Factory deployments of the near future must themselves be connected, up and down the supply chain in order to manage and leverage continuous streams of data. We will introduce the concept of a data stream, which is continuous and without end, as the means to improve quality while opening the door to new revenue streams – all with an eye toward security and privacy.

The automotive industry is in the midst of an electronics revolution. Safety-critical features are in high demand; emissions standards are pushing manufacturers toward electrification; 5G, Smart Cities and the Connected Car will drive the need for ever increasing data streaming and management; and the trend toward Serviceable oriented Architectures (SoA) will create new opportunities for revenue. The Smart Factory of the near future will be the center hub of connectivity, with data streams coming from all directions. Traditional functions, like Predictive Quality, will be extended both up the supply chain, to individual components, and down to the consumer for post-production support. New revenue opportunities have already been identified and many more will come. Data is where the money is and where the challenges lay. It must be processed, managed and shared in real-time -- even as it grows exponentially. Growing concerns and regulations related to cybersecurity and privacy must also be addressed by design, as they can single-handedly derail the entire supply chain. In this session we will introduce the concept of the data stream, and how deploying it securely is a critical enabler of the future, fully connected Smart Factory.

Biography
Lawrence Vivolo is a world-wide Sr. Business Development Manager for Automotive and Semiconductor Design, Validation and Manufacturing at Dell Technologies. Lawrence received his Bachelor of Science degree in Electronic Engineering from California Polytechnic State University, San Luis Obispo, and his Master in Business Administration from Santa Clara University, Santa Clara, California. Lawrence's interests and 30+ years of experience include CPU architecture specification, semiconductor and system-level solution validation, Advanced Driver Assistance and Autonomous Vehicle (ADAS/AD) verification, distributed R&D enterprise infrastructure architectures. Lawrence was most recently awarded a patent for automatic

generation of properties to assist hardware emulation in 2017.

Automotive Reliability – Contamination Management and Maturity of the Ecosystems

A. Amade
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Entegris S.A.S., Microcontamination Division, Moirans, France

Abstract
As we move into a more electrified and automated reality, the sustainability of functional safe and secure electronic systems is a major concern of automobile manufacturers. The complexity of high-performance systems is not possible without the application of the latest semiconductor technology nodes. Now more than ever, auto makers must dig even deeper into their supply chains to identify and eliminate the root causes of potential hazards, many of which are created during the manufacture of the semiconductors that build the systems upon which drivers rely.

To truly address functional safety, it is essential that the automotive industry and semiconductor manufacturers work together to create frameworks that improve functional safety for all stakeholders by exploring and optimizing the intersection of contamination control, inspection, and test.

Since SEMICON Europa 2018, Entegris has been spreading, with the support of SEMI and car makers, a New Collaborative Approach, a process to tackle defectivity with an improved contamination management strategy.

With this presentation we want to share our progress. Is there any meaningful trend that is worth to report in terms of defectivity management? What have we learnt in terms of maturity of the ecosystems? Any correlation with the major technology inflection points? Where should semiconductor manufacturers focus their efforts?

Biography
Mr. Antoine Amade joined Entegris in 1995 as an application engineer in our semiconductor business. Today, he is the VP of sales for the MC Division in EMEA/NA focused primarily on growing the semiconductor business and developing new market opportunities through market strategies and the management of business teams. He also leads the Entegris automotive program.

Mr. Amade has a degree in Chemical Engineering from ENS Chimie Lille and is a member of the SEMI Electronic Materials Group, the Global Automotive Advisory Council for Europe (GAAC) and the Platform for Automotive Semiconductor Requirements Along the Supply Chain (PASRASC).

Advanced Silicon Carbide Single Wafer Wet Chemical Etching and Polishing at Ambient Temperature

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The art of wet processing.

Abstract
Silicon carbide (SiC) is the material of choice for next generation power devices in fast growing applications like electromobility and renewable energies. While a strong market demand meets a challenging wafer manufacturing process, material shortage drives substrate costs and limits faster roll out of this technology. Additionally, the well developed and established wet chemical etching and cleaning processes for silicon substrates like RCA clean, SPM and APM do not achieve the required performance for SiC processing due to the chemical inertness of this new material. By increasing the temperatures of the wet processes and applying pressure, the desired etching rate could be reached, but the required equipment solutions and the wet chemical processes would get very complex and challenging for integration in high volume production.

Electrochemical etching can overcome these hurdles at ambient conditions. This contribution introduces a novel technology for single-wafer electrochemical etching of SiC, porous SiC formation and polishing. The patented solution relies on touchless electrical contacts. It ensures fast SiC etching at zero edge exclusion and competitive costs. The system allows new degrees of freedom in device design and enables advanced process flows for SiC wafer and device manufacturing.

Biography
Holger H. Kuehnlein, PhD
Dipl. Chem.
Senior Vice President Technology & Innovation
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Holger H. Kuehnlein has his scientific background in physical chemistry with focus on electro and polymer chemistry. Starting his chemistry studies in 1999 at Technical University of Dresden he was able to gain early industrial experience for ECD of flip chip bumps and packaging at KSW Microtec AG a local startup company for flexible RFID labels and devices. Until 2004 the scientific works at university focused on improving mass transfer rates and metal deposition properties in microstructure using pulse plating technologies supported by magnetic field effects.
For his PhD thesis at ATOTECH Germany GmbH Berlin he worked on kinetic and material property studies of the electrodeposited ternary alloy system Cu_2ZnSn and the transfer to CZTSSe compound semiconductor material for thin film photovoltaics. This base opened the opportunity for him to enter RENA Technologies in 2007 during early industrial spread of silicon PV. After guiding different positions as product manager and R&D team leader Holger H. Kuehnlein is heading since 2015 the Department of Technology & Innovation inside the RENA group. While his focus remained on wet chemical processes he drove the successful diversification strategy of RENA and entered with his team the business fields of glass displays, semiconductor wafering and plating. His current development works focus on new wet chemical processes for compound semiconductors as Silicon carbide and Lithium ion batteries using electrochemical processes for polishing, porosification and deposition.

Seeing Beyond the Visible: The Short-Wave Infrared Revolution

A. Bakal
CEO
TriEye, Tel Aviv, Israel

Abstract
Sensing in the SWIR spectrum enables several applications that are not possible with the use of Visible or NIR cameras, offering superior vision, functionality, and operability under all weather and lighting conditions. In the automotive market, it already enhances human driver capabilities and assists in the detection of previously invisible hazards on the road.

In addition to vision under low visibility conditions, most materials are recognizable in the SWIR spectrum in comparison to VIS or NIR cameras. SWIR cameras can sense materials and make them “visible” and actionable to human operators, video analytics, or deep learning applications. By comparing the relative reflection of light of different materials in carefully chosen spectral bands, the differences between the spectral signatures, therefore between different materials, are revealed and easily detected.

But while InGaAs-based SWIR cameras have been around for decades, serving the science, aerospace, and defense industries, they have not yet been used for mass-market applications due to their high costs, low production yield, and large form factor.

TriEye is the pioneer of mass-market short-wave infrared (SWIR) sensing solutions. The company’s breakthrough, proprietary technology enables cost-effective and high-resolution SWIR imaging; via a patented CMOS process, we reduce the cost of a SWIR sensor by up to 1000x - thereby enabling SWIR technology for a variety of transformative applications across automotive, industrial, biometrics, security, consumer electronics, and medical markets.

Join us in this fascinating session to learn about this world's first innovation and unlock the unique properties of SWIR sensing for mass-market applications, the complex vision gaps it is here to solve, and what is yet to be discovered.< div id="l-content" >

Biography
Avi Bakal, CEO and Co-Founder of TriEye has achieved a mass-scale technological breakthrough in record time, creating a giant leap in ADAS and AV safety, reliability, and functionality. Avi is an experienced multidisciplinary Physicist and Electrical-Engineer. He has a BSc in Computer Science and Electrical-Engineering and an MSc in Applied Physics specializing in optics and lasers. Avi served as a combat commander in a special unit in the Israeli Air Force. Additionally, he published two articles in distinguished scientific journals and was highlighted in Nature Photonics Journal. Avi was recently named as CEO/Managing Director of the Year by Image Sensors Europe 2020 Awards.