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MEMS & Imaging Sensors Summit

Sensors to Make the World Greener, Easier and Safer

P. von Schierstaedt
Vice President & General Manager of Radio Frequency & Sensors
Infineon Technologies, Neubiberg, Germany

Abstract
abstract description coming soon

Biography
Philipp von Schierstädt
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Philipp von Schierstädt has been Business Line Head RFS and Extended Board Member of the Power & Sensor Systems Division at Infineon Technologies AG since 2011. Philipp von Schierstädt was born on 19th May 1970 in Munich. He
has studied mechanical engineering and economics (Dipl. Ing. Technical University Berlin), holds a Master in Economics (University of St. Andrews) and has written his engineering diploma thesis at the Massachusetts Institute of Technology (MIT USA).

He joined Infineon Technologies AG in 2001.

Algorithms, Embedded AI and MEMS Sensors: The Silent Enablers of Sophisticated Daily-Life Use Cases

R. Schellin
Vice President and Head of Product Area MEMS
Bosch Sensortec | Robert Bosch GmbH,
Reutlingen, Germany

Abstract

MEMS sensors are playing a key role as the silent enablers of todays and future consumer electronics applications. With the growing relevance of social trends like safety, health and personalization, the complexity of daily-life use cases is increasing. To tackle the resulting challenges, new approaches are required in the MEMS sensor industry. In order to continue providing additional value to customers, a stronger focus on hardware-software co-design is required by using advanced algorithms and embedded AI. In his keynote presentation, Dr. Ralf Schellin, Vice President and Head of Product Area MEMS at Bosch Sensortec, will illustrate the “silent” role of advanced algorithms, MEMS sensors and embedded AI by providing specific use case examples in the context of localization, environmental sensing and self-learning.

Biography

Ralf Schellin received his PhD degree in Electrical Engineering and his Master degree in Technical Physics at the Technical University of Darmstadt, Germany. Currently he is based in Reutlingen, Germany, where he is Head of the Product Area MEMS of Bosch Sensortec. Prior to this, he was Director of Product Management of Bosch Sensortec. From 2010 to 2014 he was leading a cross divisional project at Bosch on Tiny Wireless Sensors for the Internet of Things. From 2007 to 2009 he was leading an engineering group at Bosch Sensortec. Between 2001 and 2006 he held various positions in engineering and product management at Siemens in Munich, Germany, in the area of mobile devices based on IP technologies. Between 1996 and 2000 he was leading various projects in the automotive area of Bosch in Reutlingen working on safety relevant MEMS based sensors. Prior to Bosch he was holding a post-doc position in biosensors at University of Twente, Enschede, The Netherlands.

Technology and Knowledge Open Hub: a Pathway to Future Imaging and MEMS

F. Profumo
President
National Research Council (CNR), Rome, Italy

Abstract
Current and future challenges in novel fields, such as quantum technologies, require a new paradigm of cooperation in the research landscape. In this evolving context, Fondazione Bruno Kessler is adapting its model to operate as an “Open Hub” of knowledge and technologies, with a focus on future sensing and imaging devices. After being conceived and engineered within the internal facility, these can be transferred to high-volume production sites: from radiation detectors to plasmonics, from silicon photonics to single-photon imaging, FBK is giving its contribution to the devices of the future such as quantum technologies, enabling novel mobility and automotive scenarios, space exploration, and faster and secure communications.

Biography
Born in Savona in 1953, he is an engineer and academic, Professor of Electrical Machines of the Politecnico Torino. He has been Italy's Minister of Education from 16 November 2011 to 28 April 2013 appointed by Prime Minister Professor Mario Monti. He has been President of the National Research Council (CNR) and had previously served as Chancellor of the Politecnico di Torino from 2005 to 2011. He is President of Business School ESCP - Campus of Turin, President of Collège des Ingénieurs - Campus of Turin, Chairman of Associazione di Fondazioni e di Casse di Risparmio SpA (ACRI), Chairman of Fondazione Compagnia di San Paolo since 2016 and Chairman of Fondazione Bruno Kessler (Trento) since 2014.

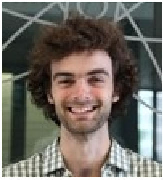
Embedded Computing the Next Paradigm Shift for Image Sensors

P. Cambou
Principal Analyst
Yole Développement, Photonics & Sensors,
Villeurbanne, France

Abstract
Imaging is an old industry which started in the 1830's on copper plates, from still images it moved to motion picture in the 1890's, the medium switched to organic film such as celluloid and then acetate. In the 1930's tube based cameras allowed television as we know it and was the first step for electronic based imaging. In the 1970's the transition to silicon based image sensors called CCDs allowed for mass adoption of electronic cameras. By the year 2000 digital photography and video took the world by storm. Since then a radical transformation of imaging applications and technology took place with Mobile applications and thanks to the CMOS image sensor technology. The world reached a peak in smartphones sales in 2017, nevertheless the sales of image sensors have grown 40% since then and the growth is expected to maintain for the 5 years to come. Two trends have contributed to this growth. The first one is the proliferation of cameras per phone and the second is the introduction of sensing cameras, mainly for biometric identification but also to help the photographic aspects such as bokeh. Innovation in imaging will not stop there and the next wave of innovation will come from artificial intelligence. While some of the innovation currently takes place either in the cloud or in the central APU, there is a trend to bring compute close to the sensor and actually embed significant amount of intelligence within or close to the sensor. In this presentation we will look at the reasons to do so and why it is important for the future of imaging. We will look at who are the players active in this new technology shift and for which kind of application.

Biography
Pierre Cambou MSc, MBA, is a Principal analyst in the Photonic and Display Division at Yole Développement (Yole). Pierre's mission is dedicated to imaging related activities by providing market & technology analyses along with strategy consulting services to semiconductor companies. He is responsible for the CIS Quarterly Market Monitor while he has authored more than 15 Yole Market & Technology reports. Pierre has an Engineering degree from Université de Technologie de Compiègne (France) and a Master of Science from Virginia Tech. (VA, USA), Pierre also graduated with an MBA from Grenoble Ecole de Management (France).

Enabling a World of Enhanced Vision



S. Goossens
Research Engineer
ICFO – The Institute of Photonic Sciences,
Barcelona, Spain

Abstract

Over the last decade, the use of cameras has expanded from photography to sensing. Most of the camera-based sensing systems convert visible light images to actionable data. However, there is an untapped wealth of information hidden in the invisible parts of the light spectrum. This invisible light allows sensing systems to increase both the quality and quantity of actionable output data by reducing ambient light interference, defying adverse ambient conditions such as fog and darkness, removing eye safety limitations and extracting compositional information.

We are developing an image sensor technology that is sensitive to visible and invisible light (Vis – NIR - SWIR, 300 - 2000 nm). The technology is based on thin-film photodetectors (graphene and colloidal quantum dots) that we demonstrated to be compatible with a CMOS back-end-of-line process. The wafer-scale process will allow the sensors to be manufactured at high volumes, posing the technology attractive to mass markets. The in-pixel gain and controllability lead to high performance levels and will allow the technology to break traditional pixel scaling laws.

Biography

tba tba

Analyze-first Architecture for Ultra-low-power Always-on Sensing

T. Doyle
CEO
Aspinity, Pittsburgh, United States

Abstract
Abstract:
Over the next five years, billions of hands-free, battery-operated, always-on sensing devices in consumer, IoT, biomedical and industrial markets will assist us in our daily lives at home and at work. As users become more dependent on such devices, they want smaller always-on products with longer-battery lifetimes. MEMS and sensors suppliers who can deliver more power-efficient solutions in ever-smaller form factors will gain a competitive edge — but how is this possible with standard signal-processing architectures?
MEMS and sensors suppliers can achieve incremental improvements in system power by improving each component in the system, but to effect great change, we need a system-level approach that achieves significant power- and data efficiency. The problem is that the current "digitize-first" system architecture digitizes all the incoming sensor data early in the signal chain — even mostly irrelevant data — before sending it to the cloud for processing. Without an alternative architectural solution, MEMS and sensors suppliers can only do so much.
A new "analyze-first" edge system architecture that uses ultra-low-power analog processing and analog neural networks now enables the detection of events — such as voice, specific acoustic triggers or a change in vibrational frequency — from raw, analog sensor data, before the data is digitized.
This "analyze-first" architecture reduces the volume of sensor data that is processed through higher-power system components (e.g., digital processors and ADCs) by up to 100x, which reduces always-on system power by 10x.
MEMS and sensors suppliers can easily integrate with the "analyze-first" edge architecture to enable smart portable products that run for months or a year instead of days or weeks.

Biography
Tom Doyle brings over 30 years of experience in operational excellence and executive leadership in analog and mixed-signal semiconductor technology to Aspinity. Prior to Aspinity, Tom was group director of Cadence Design Systems' analog and mixed-signal IC business unit, where he managed the deployment of the company's technology to the world's foremost semiconductor companies. Previously, Tom was founder and president of the analog/mixed-signal software firm, Paragon IC solutions, where he was responsible for all operational facets of the company including sales and marketing, global partners/distributors, and engineering teams in the US and Asia. Tom holds a B.S. in Electrical Engineering from West Virginia University and an MBA from California State University, Long Beach.

Novel Platform to Solve 3D Nanometry Challenge

M. Utriainen
CEO
Chipmetrics Oy, Joensuu, Finland

Abstract

The future competitivity of microelectronics is based on the capability to develop components into smaller space with better energy efficiency and high performance. The 3D is a megatrend in semiconductor manufacturing eg. in the form of 3D transistors (FinFETS) and memory (3D NAND, and DRAM). High aspect ratio structures, new materials, and tighter geometries are challenges to the developers of process tools, materials, and inspection and testing.

Chipmetrics business idea is to solve the problem by the MEMS-process based special silicon test chips and on-chip characterization concepts. The starting point is the PillarHall® Lateral High Aspect Ratio (LHAR) silicon test chip innovation for ALD/CVD thin film conformality metrology developed in VTT Technical Research Centre of Finland.

Premium product is 15x15 mm PillarHall® LHAR4 test chip consisting of 18 LHAR test structures. In addition, the test chip has structures to monitor thin film stress in microscopic level. Special carrier wafer allows wafer level mapping of the thin film conformality, film properties on the trench wall and local stress.

The benefits are such as:

• Less need for destructive cross-sectional analyses and equipment investments. No sampling delay. Compatible to standard planar metrology techniques, in a simplest case by optical microscope image analysis.

• The test chip is commercially available as a product, and allows to compare 3D perfomance by any thin film material or equipment vendor.

• Wide compatibility to ALD and CVD systems and process conditions, including plasma assisted processes.

• Extremely high aspect ratios, up to 10000:1, that are not available in the market otherwise

PillarHall platform can accelerate learning about films to go beyond simple step coverage measurements and look at the detailed properties of films in high aspect ratio structures, anticipating problems early in the development process and providing detailed insights.

Biography

Mikko Utriainen received his PhD from Helsinki University of Technology in Chemical Engineering in 1999, with the topic: “Atomic Layer Deposition (ALD) thin films in chemical sensor applications”. At that time, the ALD technology was still in its infancy. Today, ALD tools are main stream in semiconductor industry. In his >25 years working career, Dr Utriainen has also managed tens of R&D project teams in industry and academy developing and commercializing sensors, instruments and automation for various applications. He has also worked as an advisor in R&D&I funding and policy in Finnish National Innovation Funding Agency and in EU-level. Furthermore, Dr Utriainen has founded 3 start-up companies to commercialize research-based deep tech innovations.

Recently, he has founded Chipmetrics Ltd, utilizing his ALD and analytical instrumentation knowledge to commercialize novel 3D conformality nanometrology concept, PillarHall®. He holds also a senior scientist position in VTT Technical Research Centre of Finland.

All-Silicon Ultrasonic Gesture Recognition

B. Kaiser
Group Leader Reasearch and Development
Fraunhofer Institute for Photonic Microsystems
(IPMS), Dresden, Germany

Abstract
Human Machine Interface technology is rocketing in importance since ubiquitous technology is more and more trending in terms of a demand for decoupling of full consciousness from user experience. A prominent example is among hearables, relying on an audio interface while not blocking the visional or tactile senses. Other applications require “silence” for different reasons while still keeping the need for comfortable operating and easy use. Gesture recognition will then play a key role in recognizing user input to various technologies without the necessity of direct contact or precisely aimed or timed (inter)actions. MEMS based ultrasonic transducers enable gesture recognition systems that can be produced at a low unit price for high volumes thus becoming just as available as it went to happen with inertial sensors in the past. Fraunhofer IPMS has developed the NEDMUT technology as an ultrasonic transducer for gesture recognition applications bringing together benefits of the MEMS world with modern technology user needs.

IPMS NEDMUT technology comprises a volume utilizing low footprint approach, ultra-low power electrostatic actuation, lead-free all silicon device, phased array, multichannel as well as combined emitter-receiver on chip capabilities.

Biography
tba tba

Miniature Digital IR Detectors Enabling Gas Sensing Everywhere

J. Phair
CTO
Pyreos Ltd., Edinburgh, United Kingdom

Abstract
ezPyro detectors are very stable over time ensuring a long and maintenance-free operational lifespan and combined with their high sensitivity and fast response times, ensure rapid and accurate detection of target gases. Various optical filter options are available for detecting a specific gas or gases of interest.

Biography
Pyreos Ltd, an Edinburgh-based SME, manufactures a unique MEMS PZT pyroelectric detector on silicon, which enables new sensor form factors and functionalities for thermal Mid-IR gas sensing – previously not available on the market. To address the growing need for gas sensors and digitalisation of gas sensing, Pyreos has developed a range of sensors to meet the requirements across a variety of application areas such as :
- Regulatory Greenhouse/depletive Ozone layer gas emissions monitoring
- Smart Cities, Smart Buildings (eg HVAC), Smart Agriculture/Precision Farming and the broader “Internet of Things” (IoT).
- Automotive applications (emissions, cabin monitoring, HVAC)
- Industry 4.0 (manufacturing, processing)

For example, the ezPyroTM range of Mid-IR detectors for gas sensing and concentration measurement combine the MEMS pyroelectric detector technology with a digital readout for a smallest-in-class SMD package. These sensors integrate a digital, current mode read-out that enables lower IR-emitter duty cycles, thereby saving significantly on system level power consumption, while maintaining high SNR. Programmable gain and filtering offer maximum flexibility in system design. Industry standard I2C communication enables plug-and-play connectivity to microcontrollers and allows easy tuning and calibration. ezPyro is well suited to applications with low power budgets. Current consumption is well below 100 µA when fully activated and less than 1 µA in the lowest power mode. The low power modes come with fast wake up times and the innovative and configurable wake-up by signal (eg. motion, gesture) feature.

XENSIV™ PAS CO_2 Sensor: New Environmental Sensor Technology: Photoacoustic Spectroscopy (PAS) Miniaturizes CO2 Sensor for High-volume Applications

A. Kopetz
Director Environmental Sensing
Infineon Technologies, Munich, Germany

Abstract

City dwellers often spend a large amount of their time indoors – whether it be in an office, at school or simply at home. Buildings, however, tend to trap air especially as the level of insulation increases for energy efficiency purposes. This could lead to the development of bad indoor air quality in case of poor ventilation, negatively impacting human comfort, productivity and health. The concentration of carbon dioxide (CO2) is a good indicator of indoor air quality.
Today´s market solutions for monitoring this odorless and colorless gas are bulky and costly or simply not good enough for widespread adoption. Leveraging its advanced MEMS microphone technology, Infineon Technologies has developed a disruptive CO2 sensor based on photoacoustic spectroscopy (PAS). XENSIV™ PAS CO2 sensor is an exceptionally miniaturized sensor designed to accommodate high-volume manufacturing; it is the first real CO2 sensor with SMD capabilities. It also includes an on-board microcontroller for easy system integration in customer products.
The innovation will enable widespread adoption of air quality monitoring in high volume applications in variety of markets such as automotive, industrial, medical and IoT.

Biography

Andreas Kopetz received his Master of Computer Science from Vienna University of Technology in 2004 and a Master of Engineering Management from Duke University, in 2005. Andreas started to work for Infineon in 2005 in the Operations & Supply Chain group covering several positions in USA, Austria and Germany. In 2010 Andreas joined Infineon’s Automotive division as product marketing manager for Electric Drivetrain power modules for hybrid and electric vehicles. In 2013 he transferred to the RF & Sensors business line within Infineon’s Power & Sensor Systems division. He has been substantially growing Infineon’s MEMS Microphone & pressure sensor business since then, recently as Director Marketing heading the product marketing and application engineering teams. Since March 2019 he is in charge of the accelerator program for environmental sensing.

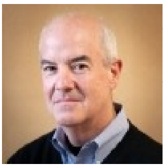
Trends in Image Sensing: Beyond Human Eyes, More Pixels, More Cameras!

J. Lee
Vice President, Head of Advanced Sensor Development Team
Samsung Electronics, Advanced Sensor Development Team, Hwaseong-si, South Korea

Abstract
So far, image sensors have been catching up with the capabilities of a human eye. However, advances in technology will allow us to enable image sensors that will go beyond the capabilities of human vision.
High resolution image sensors (More Pixel, e.g. Samsung's 108MP CIS) and multiple cameras (More Cameras, e.g. Tele, Wide, Ultra-wide and 3D) would soon allow the consumers to see more details than a bare human eye can see.

Biography
V.P. Lee has contributed to technology developments of camera image sensors over 20 years in Samsung Electronics.
Since he has developed ISOCELL which is the cutting-edge pixel technology, especially appropriate for pixel shrink and performance enhancement,
he has concentrated his efforts on the corresponding circuit designs and differentiated camera functions for mobile sensors.
Additionally, he has also focused on the pixel merging technologies such as Tetra-cell, Nona-cell to secure high image quality even in the low light conditions.
Based on "More pixel, More camera" strategy, he has led the mobile image sensor market by developing sensor products like 16Mp(1.0um ISOCELL, 3P3) sensor in 2014, 24Mp(0.9um, 2X7) sensor in 2017, 32Mp(0.8um, GD1) sensor in 2018.
Subsequently, he succeeded in developing the high resolution sensors like 64Mp(0.8um, GW1) and 108Mp(0.7um, HMX & HM1) sensors in 2019.
Though he has led the newly developing technologies for mobile CMOS Image Sensors(CIS), he has currently extended his interests to development of emerging image sensors such as Dynamic Vision Sensor(DVS), Long Wavelengths Infrared(LWIR), Ultraviolet(UV) sensors, etc.

A Simple Easy to Deploy Single Camera near Depth Solution



P. Gallagher
VP Strategic Marketing
Airy3D, Montreal, Canada

Abstract
Imaging is undergoing a radical transformation in the way that an image sensor captures, processes, and uses data. The traditional application to capture a memory has expanded to a fast-growing collection of applications spanning: facial and object recognition, robot and vehicle navigation, surveillance and biometrics, smart homes, appliances and cars, image retrieval, gaming and controls. These smart applications require accurate and reliable 3D images, and therefore, we've seen a proliferation of 3D imaging technologies.

This presentation will review different depth sensing technologies and the smart applications that are well suited for them. AIRY3D's DEPTHIQ™ platform for the 3D computer vision will be introduced as well.

AIRY3D's DEPTHIQ™ TDM (Transmissive Diffraction Mask) optical encoder and IDP (Image Depth Processing) software enable any single 2D image sensor to produce high-quality color images and 3D near-field depth maps with unrivaled simplicity. DEPTHIQ-powered sensors are ideal for anti-spoofing by photos in facial identification, video bokeh, image segmentation, person detection and monitoring, collision avoidance, as well as a host of other embedded vision applications.

Biography
PAUL GALLAGHER
VP Strategic Marketing
With over 30 years of industry experience, Paul has held executive, technical and product leadership roles at many of the top imaging sensors original equipment manufacturers. He has worked in most applications involving imaging devices, from BarbieCams to Missile Navigation and Mobile Phones to DNA Sequencing. He conitnues to be an industry speaker and a reference source for market research studies. Paul holds a BE in Engineering Physics, Lasers & Applied Optics from Stevens Institute of Technology, and an MBA from Pepperdine University.

Novel Bonding Technologies for Photonic and MEMS Sensor Integration

B. Dielacher
Business Development Manager
EV Group, St. Florian am Inn, Austria

Abstract

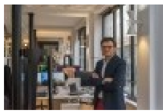
MEMS sensors are a key technology for many of today´s applications and must meet the highest standards of performance and reliability. Current devices on the market already have a high level of integration to fulfil these requirements, such as inertial measurement units. Emerging MEMS applications are diversifying in their capabilities and increasingly focus on integrating technologies from other disciplines, such as photonics, biomedical and nanotechnology. Innovative manufacturing technologies are thus developed to enable such integration schemes. In particular, high precision adhesive wafer-level bonding provides a reliable interface to facilitate the integration of different materials and technology platforms. Advances in pre-processing such as surface preparation, coating and adhesive patterning will be discussed including the preparation of ultrathin adhesive films and EVG´s adhesive layer transfer technology. Furthermore, wafer bonding capabilities will be presented and it will be shown how individual photonic chips can be transferred and integrated with a collective wafer-based process.

Biography

Dr. Bernd Dielacher is business development manager at EV Group where he is responsible for the MEMS as well as the bio- and medical technology market.

Bernd holds a master’s degree in Microelectronics from Vienna University of Technology and received a PhD in Biomedical Engineering from ETH Zurich, where he explored metal nanostructures for electrical and plasmonic sensing in biomedical applications.

Toward Event-Based Vision Wide-scale Adoption



L. Verre
CEO
PROPHESEE, Paris, France

Abstract
Since their inception 150 years ago, all conventional video tools have represented motion by capturing a number of still frames each second. Displayed rapidly, such images create an illusion of continuous movement. From the flip book to the movie camera, the illusion became more convincing but its basic structure never really changed.

For a computer, this representation of motion is of little use. The camera is blind between each frame, losing information on moving objects. Even when the camera is recording, each of its “snapshot” images contains no information about the motion of elements in the scene. Worse still, within each image, the same irrelevant background objects are repeatedly recorded, generating excessive unhelpful data.

Evolution developed an elegant solution so that natural vision never encounters these problems. It doesn’t take frames. Cells in our eyes report back to the brain when they detect a change in the scene – an event. If nothing changes, the cell doesn’t report anything. The more an object moves, the more our eye and brain sample it.

This is the founding principle behind Event-Based Vision – independent receptors collecting all the essential information, and nothing else.

Prophesee is the inventor of the world’s most advanced neuromorphic vision systems. Composed of patented Metavision® sensors and algorithms, these systems enable machines to see what was invisible to them until now.

With 10-1000x less data generated, >120dB dynamic range and microsecond time resolution (over 10k images per second equivalent), Prophesee Metavision® opens vast new potential in areas such as **autonomous vehicles, industrial automation, security and surveillance, mobile, IoT and AR/VR**. Its solutions improve safety, reliability efficiency and user experiences across a broad range of use models.

Biography
Luca Verre is Co-Founder and CEO of Prophesee, the inventor of the world’s most advanced neuromorphic vision systems. Prophesee’s patented technology is inspired by human vision, giving sight back to the blind and unlocking new safety and autonomy standards for cars, robots and mobile devices.

Luca is a World Economic Forum Technology Pioneer. He has extensive international management experience in the industrial and electronics sectors. His experience includes project and product management, marketing and business development roles at Schneider Electric. Prior to Schneider Electric, Luca worked as a Research Assistant in Photonics at the Imperial College of London. Luca holds a MSc in Physics, Electronic and Industrial Engineering from Politecnico di Milano and Ecole Centrale and an MBA from INSEAD.

COTS Image Sensors Help New Space Programs

A. Bardoux
Head of Detection Department at CNES
CNES, Detection Chain, Toulouse, France

Abstract
Space programs use more and more COTS components for image sensing, because of their cost, and also their performances that are at the state of the art. Of course, COTS components need to be qualified to be used in satellites, because they have not be designed to survive to space environment. This presentation describes several space programs leaded by CNES (French Space Agency), the COTS image sensor used, in various wavelength, and the qualification activities.

Biography
Alain Bardoux has been working for 15 years as Head of “Detection chain “ department , dealing with optoelectronic detectors and associated electronics for all wavelengths from
X-ray to submm., for Space missions in which CNES is involved : High resolution Earth remote sensing, Atmospheric sounding, Astronomy, planetology
Formerly, he has been responsible for the development and the procurement of flight models for several space missions: SPOT 5, Helios 2, Corot.
Today, he manages particularly the setting up of CMOS detectors European supply chain, and large/very large format infrared detectors.

Above and Beyond methodology: Robustness Validation of Automotive MEMS Sensors

S. Vos
R&D Director, PL Motion Sensors
NXP Semiconductors, Chandler, United States

Abstract

MEMS & Sensor devices have been used for safety applications for 2 to 3 decades, but quality and reliability requirements continue to outpace capabilities. The electronics industry has not defined an advanced quality and reliability beyond the AEC Q100 and ZVEI Robustness Validation specifications.
NXP is proposing an "Above and Beyond" methodology intended to 1) produce higher body of evidence to enable lower ppm resolution of stress testing, 2) run serial reliability testing to better evaluate failure mechanisms and produce physico-chemical models of these mechanisms, 3) test reliability stress-to-fail to enable reliability modeling of failure mechanisms, and 4) reliability test corner lots to understand the design-process-manufacturing space with respect to quality and reliability.
In the presentation, NXP will propose a methodology for tailoring these four types of quality and reliability evaluation testing to MEMS/Sensor products and their intended use-cases: supply chain / assembly and end-user application.
Moreover, NXP will promote adoption of this methodology as a means of addressing the continuously stricter requirements particularly related to the security and safety of automotive applications.

Biography

Sandy Vos received her PhD from University of Minnesota in Materials Science and Engineering and has 20 years of industry experience in MEMS, microsystem, materials, component, composite and semiconductor technology and product development. She joined NXP in 2018 and is currently Director of R&D focused on inertial sensing, including automotive safety-critical devices. Her work requires the incorporation of functional safety and advancements in the state-of-the-art quality to MEMS physical sensors, within the significant challenges of an aggressive automotive-focused market as it extends into the vision of autonomous vehicles. Dr. Vos was Director of MEMS Engineering and Sr Manager of Product Development at Knowles Corporation in their Consumer Electronics division. At Knowles she was also a technical and design lead for consumer and hearing health microphone development programs in acoustic MEMS sensors. She has worked in the fields of surface mount fuse and suppressor design and manufacturability at Littelfuse, Inc and plastic composite design and manufacturability at Azdel, Hanwha.

120fps, Ultra High Definition (8K UHD), Low Noise, Global Shutter Sensor for High-end Rigid Endoscopy

J. Segovia
Senior Principal Engineer
Teledyne e2v, Technology & Product Development, Seville, Spain

Abstract
Teledyne e2v presents the use of our Emerald 36M CMOS image sensor (which is a derivate version of Emerald 67M) for use in high-end rigid endoscopy. Teledyne e2v has several image sensors suitable for rigid endoscopy: Emerald 2M, Emerald 8M and finally Emerald 36M. This particular sensor provides ultra-high definition resolution, low noise (2.8eRMS) and high speed (120fps), enabling the medical surgeon to have a system with a reduced number of total cameras, increased precision in surgery and also improved patient comfort.

Biography
coming soon