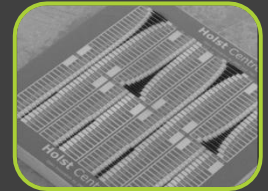
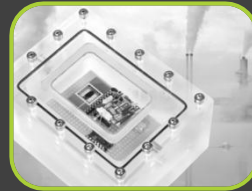
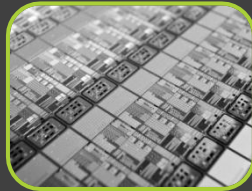
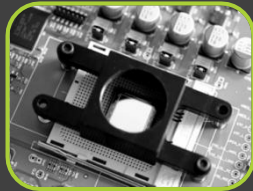
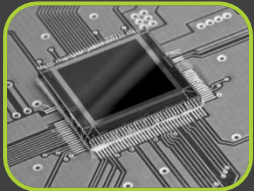


SEE ■ FEEL ■ SMELL

SENSORS OF THE FUTURE

SYMPOSIUM ■ NOVEMBER 28, 2012 ■ IMEC ■ LEUVEN



About the event

There is a trend towards smart electronic systems that interact with their surroundings. Sensors form the cornerstone of these systems, enabling them to see, feel or smell what is going on. A lot of technology breakthroughs are realized in this field. With this event we offer you the opportunity to discover the latest evolutions and meet sensor experts from leading universities, knowledge centers and companies. Moreover, during the breaks, you will be able to witness real-life demos of state-of-the-art sensor technology. We are convinced that this event will trigger new ideas to revolutionize your products or processes. Let us innovate together!

Target audience

Everyone involved in research, development and integration of sensor technology (R&D managers, product development engineers, product managers, process control and automation engineers, quality controllers, researchers)

Venue

The event will take place at imec, Kapeldreef 75, 3001 Leuven.
A route description can be found on: <http://goo.gl/gVH3B>

Registration

You can register for the complete event or select the part(s) that are of interest to you.
Registration fees (excl. VAT):

	Regular	Early bird
▪ Complete event	€150	€120
▪ Part I – SEE (includes lunch)	€60	€48
▪ Part II – FEEL (includes coffee break)	€60	€48
▪ Part III – SMELL (includes networking drink)	€60	€48

Early bird discount of 20% until November 9, 2012.
COHESI Community members can attend the event free of charge.

You need to register by email on training@imec.be (deadline November 21, 2012).

About the COHESI initiative

COHESI is the Flemish Innovation Platform for smart microsystems. Experts from imec, KU Leuven, UGent and VUB bring mature technologies within your company's reach. Even more: COHESI combines the knowledge, the infrastructure and the support that let you create and integrate the microsystems you want. From prototype to final product. COHESI is there to make your innovation happen, whether your company is small or large, experienced or new in microsystems innovation.

For more information, please contact cohesi@imec.be.

Program

09:30 REGISTRATION

10:00 Welcome

Rudi Cartuyvels, Senior Vice-President, imec

10:10 Overview of the COHESI initiative

Christophe Bruynseraede, Innovation Program Manager, imec
Jan Potemans, Innovation Program Manager, imec

SEE

10:20 Specialty imagers

Kiki Minoglou, Senior Researcher, imec

10:40 Hyperspectral vision systems

Klaas Tack, Senior Researcher, imec

11:00 & Cooled and uncooled focal planes and cameras for infrared imaging and spectroscopy

Jan Vermeiren, Technical Business Development Manager, Xenics

11:20 & Unique gloss/color detection and thermal vision system

Stefan Erpels, Technical Advisor, Sensor Partners

11:40 & Magnetic field camera for fast and high resolution magnet inspection

Koen Vervaeke, Founder & Managing Director, MagCam

12:00 LUNCH

FEEL

13:00 & Ultra-thin flexible optoelectronics based shear sensor

Jeroen Missinne, Senior Researcher, Universiteit Gent - imec

13:20 & Draw Tower Gratings for various sensing applications

Johan Vlekken, Chief Technology Officer, FBGS International

13:40 & Temperature independent optical fiber pressure sensor

Thomas Geernaert, Senior Researcher, Vrije Universiteit Brussel

14:00 High temperature optical pressure sensing integrated on a fiber

Grim Keulemans, Researcher, Katholieke Universiteit Leuven

14:20 & Paving the way towards ultra-compact fiber sensing systems

Bram Van Hoe, Researcher, Universiteit Gent - imec

14:40 & Composites and Sensing, feels like a perfect match

Eli Voet, Managing Associate, Com&Sens

15:00 System integration for pressure sensors

Appo van der Wiel, MEMS & WLP process manager, Melexis

15:20 COFFEE BREAK

SMELL

16:00 & Electrochemical pH and chloride sensor for dehydration monitoring

Hila Einati, Senior Researcher, Holst Centre - imec

16:20 & Electrochemical ethylene sensor for fruit quality monitoring

Marcel Zevenbergen, Senior Researcher, Holst Centre - imec

16:40 Optical gas sensor for selective detection of ammonia and other compounds

Nebiyu Yebo, Researcher, Universiteit Gent

17:00 & Smart sensor technologies for cold chain quality monitoring

Romano Hoofman, Senior Scientist / Project Leader, NXP Semiconductors

17:20 Fluorescence-based optochemical sensor on flexible foils

Sandeep Kalathimekkad, Researcher, Universiteit Gent - imec

17:40 & Miniaturized electronic nose

Dewez Karabacak, Senior Researcher, Holst Centre - imec

18:00 NETWORKING DRINK

& includes demo during breaks



SEE

Specialty imagers

Kiki Minoglou, Senior Researcher, imec

Imec develops imagers using its flexible 130 nm CMOS technology as a baseline. Additional processing modules e.g. backside illuminated imagers or embedded CCD-in-CMOS enable specialty imagers for high-end applications such as space imaging and instrumentation. An overview of the competences and examples of developments will be presented.

Hyperspectral vision systems

Klaas Tack, Senior Researcher, imec

Hyperspectral vision systems image the world with a very high spectral ('color') resolution. Imec developed a high-performance yet cost-effective hyperspectral vision technology that will enable a broad range of applications from earth observation over industrial inspection to medical. Current results as well as the ongoing developments in hyperspectral vision systems will be discussed.

Cooled and uncooled focal planes and cameras for infrared imaging and spectroscopy

Jan Vermeiren, Technical Business Development Manager, Xenics

Infrared imagers are not only following with a certain delay Moore's law about image sensor size, also the number of available IR sensitive materials is increased drastically over the last years with the introduction of bandgap engineered materials and of metamaterials. Simultaneously the computing power in infrared cameras is increased, allowing fast and on-board image correction, image calibration and sensor fusion.

Unique gloss/color detection and thermal vision system

Stefan Erpels, Technical Advisor, Sensor Partners

The new InTherCam thermal vision system analyzes the image, based on temperature differences from a thermographic image. Our color sensor analyzes the proportional value of red, green and blue, but also the illumination, which is unique. Our gloss sensor ensures an intensity independent evaluation, due to a simultaneous measurement of the object from two different directions, which consists of direct and diffuse reflection.

Magnetic field camera for fast and high resolution magnet inspection

Koen Vervaeke, Founder & Managing Director, MagCam

MagCam, a spinoff company of imec, presents a unique magnetic measurement technology, called the 'magnetic field camera' or 'MagCam', which finds its application in advanced inspection of permanent magnets, such as the smaller high-quality magnets used in sensor applications or larger magnets in electrical drives for e-mobility. This powerful and unique measurement platform allows for fast and accurate live inspection of both uniaxial and multipole permanent magnets.

FEEL

Ultra-thin flexible optoelectronics based shear sensor

Jeroen Missinne, Senior Researcher, Universiteit Gent - imec

A new type of shear stress sensor is based on optoelectronic components embedded in 40 µm thin polymer foils, so that they can easily be applied on curved or moving surfaces, such as the human body. Since these sensors are so thin, they could be integrated unobtrusively in a foot sole or prosthetic socket, for example.

Draw Tower Gratings for various sensing applications

Johan Vlekken, Chief Technology Officer, FBGS International

Fiber optic sensors for strain/vibration and temperature based on Draw Tower Gratings (DTGs) offer several crucial advantages to traditional electric sensor technologies. Being robust and corrosion-free they remain unaffected by electrical environments and they permit optical transmission of sensor signals over large distances. With these properties, fiber optic sensors are well suited for safety-critical areas from medical industry through renewable energies, to aerospace and have proved themselves under the most difficult environmental conditions.

Temperature independent optical fiber pressure sensor

Thomas Geernaert, Senior Researcher, Vrije Universiteit Brussel

The Brussels Photonics Team B-PHOT developed a temperature independent optical fiber pressure sensor with a sensitivity that is a 100x higher than existing systems and a pressure range up to 1000 bar. This was made possible by developing a special photonic-crystal fiber. The sensor can be embedded in polymers, metals and composite materials and can measure elongation and tension. The system is compatible with commercially available readout circuits and is now ready to be applied in industrial environments.

High temperature optical pressure sensing integrated on a fiber

Grim Keulemans, Researcher, Katholieke Universiteit Leuven

Fabry-Pérot interferometer-based optical sensors are fabricated directly on the top of an optical fiber based on thin film techniques and focused ion beam (FIB) machining. The extremely small size and rugged monolithic construction are ideal for high temperature and harsh environment pressure probing. Recent advances focus on the application of these sensors in turbo-machinery and flow field measurements in general.

Paving the way towards ultra-compact fiber sensing systems

Bram Van Hoe, Researcher, Universiteit Gent - imec

We introduce a revolutionary way to embed and interrogate optical fiber sensors based on fiber Bragg gratings. Low-cost optoelectronic chips are used to drive and read out the optical fibers resulting in a highly miniaturized, portable dynamic sensing system with a thickness of only 1 mm, serving as an alternative for the traditionally bulky and expensive fiber sensor interrogation units.

Composites and Sensing, feels like a perfect match

Eli Voet, Managing Associate, Com&Sens

Fiber optic sensors, especially fiber Bragg gratings (FBGs) are of great interest towards the composite community since they are easily integrated within the reinforcing fibers of the composite material and since they gather much more local strain information in their optical spectrum than any other type of sensor. Hence they can be applied for different purposes; starting from the occurrence of residual strains during the composite manufacturing process, the measurement or mapping of load and strains in-service, up to the monitoring of the fatigue life, material deformations and initiation of damage in the material.

System integration for pressure sensors

Appo van der Wiel, ME/MS & WLP process manager, Melexis

Traditionally the pressure sensor design focused on the silicon die only. Calibration was carried out on module level. Today the demand for calibrated sensors is growing as calibration on module level is expensive. This presentation shows that through system design low cost calibration can be achieved by using a standard package and an on-chip microcontroller. Furthermore an outlook is given how client specific packages can be achieved after calibration.

SMELL

Electrochemical pH and chloride sensor for dehydration monitoring

Hila Einati, Senior Researcher, Holst Centre - imec

Electrochemical sensors are extremely versatile, intrinsically low power and can be applied in many areas. Illustrating this, we will discuss the basic functioning and performance of a wireless handheld ion sensor that can simultaneously determine the pH and chloride level in sweat and can be applied for dehydration monitoring.

Electrochemical ethylene sensor for fruit quality monitoring

Marcel Zevenbergen, Senior Researcher, Holst Centre - imec

We will present an electrochemical ethylene sensor for fruit quality monitoring, that exploits a thin layer of ionic liquid as electrolyte. Ionic liquids are fluids that completely consist of ions at room temperature and have emerged as promising electrolytes in electrochemical gas sensors. A first prototype already achieved a 1 ppm detection limit and a linear response up to 10 ppm, which is a useful concentration range in fruit quality control.

Optical gas sensor for selective detection of ammonia and other compounds

Nebiyu Yebo, Researcher, Universiteit Gent

A growing paradigm shift in the health care and the environmental sectors has raised an increasing interest for mass produced, portable, low cost, robust and energy efficient gas detection tools. We present sensitive, selective and reversible ammonia detection with a chemically functionalized silicon photonic micro-ring resonator. Detection down to 5ppm ammonia is demonstrated with a selective response over carbon dioxide indicating a potential application in medical breath analysis.

Smart sensor technologies for cold chain quality monitoring

Romano Hoofman, Senior Scientist / Project Leader, NXP Semiconductors

In the Pasteur project a wireless sensor platform has been developed which is able to monitor and control the quality of goods by autonomous logging of the environmental conditions of products during transport and storage in the cold chain. At the core of the platform one can find a multisensor chip (SEN300 from NXP) which is able to measure temperature, relative humidity and ambient light.

Fluorescence-based optochemical sensor on flexible foils

Sandeep Kalathimekkad, Researcher, Universiteit Gent - imec

A new concept for optochemical gas sensing using fluorescent dyes is presented. A fluorescent dye is incorporated in the core of a PDMS based optical waveguide which is porous to certain gasses. This waveguide sensing element is fabricated on a flexible foil which can also contain the driving light sources and detectors to yield a compact and fully integrated sensor patch.

Miniaturized electronic nose

Devrez Karabacak, Senior Researcher, Holst Centre - imec

Detection and identification of "smells", complex mixtures of vapors, in compact form factor with power efficient devices is expected to enable a wide range of applications, from environmental monitoring for health and safety to breath analysis for pre-diagnosis or medication dosing. Here, we present an "electronic nose" system whereby vapor mixtures are detected by high accuracy measurements of the vibrational frequencies of polymer-coated micromechanical structures.

COHESI Community members:

