



IEEE SF Bay Area MEMS and Sensors Chapter

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Metal Oxide Sensor and Signal Conditioning for Indoor Air Quality Sensing; Gas Sensor Principles, Technology, and Application for Consumer Indoor Air Quality



Speaker: John Bergstrom, Manager, Environmental Sensors, ZMD America Inc.

Date/Time: Wednesday, Jan. 27th, 2016, 7:00 pm

Location: Texas Instruments Building E Conference Center, 2900 Semiconductor Dr., Santa Clara, CA 95052

Food: Pizza and beverages will be available starting at 6:00 pm for a donation at the door.

Sponsorship: Contact sfba-mems-officers@listserv.ieee.org if you are interested in sponsorship this meeting.

The 'Internet of Things' is the concept of connectivity and the ability to gather information about the environment of the consumer and using that information to enhance the lifestyle of the consumer. The generation of inertial sensors and pressure sensors have reached maturity – sensor fusion has enabled location based services and gesture recognition and monitoring of physical activity. The next phase will be gathering information about the environment of the consumer and providing vital information to the consumer. The metal oxide (MOx) chemiresistor gas sensor technology has been used for industrial applications since 1970s. There is interest to apply this technology to consumer handheld applications. The MOx technology has been established for the industrial applications but application to consumer applications requires a new generation of sensors and signal conditioning ASICs. The paper reviews MOx technology and the limitations to apply the technology successfully to handheld platforms and introduces a novel combination of hardware and software methodology that can be used to identify gas compositions and determine concentrations with better performance than traditional MOx sensor solutions.

Bio: John Bergstrom has B.S. degrees in Ceramic Engineering, Metallurgy, and Mechanical Engineering from Iowa State University. Since 2013, he has been a manager and technical lead for the Mobile Sensing Group at ZMDI, a leader in the area of signal conditioning ASICs for multiple sensing applications. He leads the development of a digital gas- indoor air quality sensor for mobile sensing applications where he coordinates product design, validation and application development. Previously, he was the R&D manager for EG&G Heimann Optoelectronics located in Singapore where he managed a joint accelerometer development project between the Institute of MicroElectronics (IME) and EG&G Heimann Optoelectronics. In 1989, he joined Kionix, Inc. where he led the development of a tri-axis accelerometer which resulted in the product introduction into cellphones for gesture recognition and screen rotation. He has published numerous papers and been awarded 8 patents, all related to sensor design and MEMS process technology for pressure sensors, inertial sensors and gas sensors.