

IEEE P2520 Seminars on Fundamentals of Odor Monitoring & Analysis December 9, 2019

Title: **Electronic Noses: The good, the bad and the ugly... (recording, slides)**
Speaker: James Covington
Electronic Engineering, School of Engineering
University of Warwick, UK

The electronic nose, or eNose, is an instrument that attempts to replicate the function of the biological olfactory system. Since the early work by Persaud and Dodd in the 1980s, it has been in continuous development, with the first commercial instrument being released in the first part of the 1990s. Over the following 25 years, there have been many attempts to improve and enhance the electronic nose and a small number of commercial instruments, using a broad range of sensors and measurement approaches. In this seminar, we present a firsthand experience of using the electronic nose equipment based in the BioMedical Sensors Lab at the School of Engineering, University of Warwick. The lab is equipped with a wide range of instruments that have been used on industrial/clinical applications over the past decade. In addition, it will discuss alternative measurement approaches, which are sometimes considered “eNose’s,” be it rightly or wrongly...! This will cover technologies including various forms of Ion Mobility Spectrometry and portable Mass Spectrometry. As part of these discussions, instruments that have been developed internally at Warwick University will be described/discussed to show how we have tempted to either solve or enhance existing commercial offerings and how successful we were in achieving this.

The seminar will include discussions on:

- a. Basic operation of the instrument and the sensing technology deployed
- b. Sample introduction and preparation
- c. Data analysis steps/suites
- d. Reliability and repeatability of these instruments

Finally, there will be discussion on the relative merits of these instruments and what we can learn from both their successes and failures.

Biography



James Covington is a Professor in Electronic Engineering within the School of Engineering at the University of Warwick. He has spent his academic career developing chemical and biological sensors for detecting a variety of environmental pollutants and biological agents, applying a wide range of electronic and MEMS techniques in the development of these novel sensors. He setup the BioMedical Sensors Laboratory in 2010, at Warwick University, to apply gas analysis techniques to the medical arena. This dedicated facility is focussed in the analysis of potential gas phase biomarkers that emanate from human waste (breath, urine, stool, sweat and skin). In addition, he has been working on developing low-cost, high-volume chemical sensors for the industrial sector. He has now produced the most cost & power efficient chemical sensors commercially available today. Such techniques are presently being applied to the environmental and agricultural sectors. He is also the president of the International Society for Olfaction and Chemical Sensing. He sits on the board of the Science & Technology for Health GRP. He has also been involved in numerous public events (including at the London Science Museum), TV programmes (Discovery Channel and BBC) and in the media for his work on smell.

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