

## Presentation Title - Chemiresistive Gas Sensors : Towards Electronic Nose

Abstract : There has been a very substantial progress in the field of chemiresistive gas sensors over the last few decades. However, the holy grail of realizing electronic nose, with massively parallel sensor array architecture has still remained a challenge. In this talk I will present a review of chemiresistive gas sensor technologies, with pointers to future research directions. I will begin with bulk-micromachining technology to achieve metal oxide gas sensor array with integrated microheaters, and then move onto surface-micromachined bus-bar architecture to realize more efficient metal oxide gas sensor array. The possibility of using metal-metal oxide core-shell nanostructures to enhance the performance of gas sensors will be discussed. A variety of process integration techniques to realize CMOS compatible core-shell structures will be presented. The emerging area of 2D materials for gas sensing application will also be discussed with representative examples. Finally, the challenges and opportunities in realizing single chip heterogenous integration of signal conditioning and inference electronics engine along with massively parallel gas sensor array elements will be presented.