Artificial Sense Technology

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Artificial senses refer to the emulation of human's basic senses and assimilate them to functional devices and systems to help us understand and perceive the world around us. This research topic of artificial senses is transdisciplinary and lies at the confluence of materials science, bioengineering, medical sciences, electrical engineering, and computer science. Some use cases, including enhanced sensory capabilities to overcome physical human limitations, improved robotic capabilities and diagnostics with smart information processing, and prosthetics and health-monitoring devices to improve quality of life, are drawing much attention. In this talk, I will present some latest progress in artificial tactile and olfaction with the viewpoint from materials development, sensor fabrication, information processing, and system integration. Artificial senses would be a new enabling technology to construct next-generation intelligent devices and systems, paving the way for advanced soft robotic applications, rehabilitation, prosthetics, and so on.

Professor Xiaodong Chen is the President's Chair Professor in Materials Science and Engineering, Professor of Chemistry (by courtesy) and Medicine (by courtesy) at Nanyang Technological University, Singapore (NTU), and Scientific Director at the Institute of Materials Research and Engineering, Agency for Science, Technology and Research (A*STAR). He is the Director of Innovative Centre for Flexible Devices (iFLEX) at NTU, the Director of Max Planck – NTU Joint Lab for Artificial Senses, and the Deputy Director of Singapore Hybrid-Integrated Next-Generation μ-Electronics (SHINE) Center. His current research interests include mechano-materials science and engineering, flexible electronics technology, sense digitalization, cyber-human interfaces and systems, and carbon negative technology. So far, he has published more than 370 high-profiled papers and filed/applied more than 40 patents.

He is the Editor-in-Chief of *ACS Nano,* a flagship journal in nanoscience and nanotechnology, and serves as editorial advisory board member for various international journals, including *Adv. Mater.*, *Small*, and *Nanoscale Horizons*. He has been elected as Fellow of Singapore National Academy of Science and the Academy of Engineering Singapore. In addition, he was recognized by multiple prestigious awards and honors including Singapore President's Science Award, Singapore NRF Investigatorship, *Small* Young Innovator Award, Singapore NRF Fellowship, Nanyang Research Award, *Lubrizol* Young Materials Science Investigator Award, Mitsui Chemicals-SNIC Industry Award in Materials and Nano-chemistry, Friedrich Wilhelm Bessel Research Award, and Fellow of Royal Society of Chemistry, and Fellow of Chinese Chemical Society.