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## Building and engineering highly organized single-walled carbon nanotube network architectures for various sensor applications

ver the past two decades, researches on low-dimensional carbon nanostructured materials (SWCNT and graphene) designed for a variety of sensor applications have made remarkable progress. However scalable fabrication and engineering of high performance

sensors that harness 2-3 dimensional nano/micro architectures of Figure-1: Various single-walled carbon nanotube these nanomaterials have remained largely elusive. Such methodologies based architectures and devices for chemical, optical will allow unprecedented device architectures fully utilizing superior and ion sensors. physical and chemical properties of these nanomaterials for high



performance and low SWaP sensors. Here we present some of our progresses in assembly and engineering of single-walled nanotube networks and building 2-3D architectures for broad ranges of high performance chemical, optical and ion sensors by combining state-of-the-art assembly and transfer based nanomanufacturing strategies developed in our laboratory.

### **Recent Publications**

- 1. J Hao, B Li, H Jung, S Hong, Y Jung and S Kar (2017) Vapor-phase-gating induced ultrasensitive ion detection in graphene and single-walled carbon nanotube networks. Advanced Materials; 1606883.
- 2. B Li, Y He, S Lei, S Najmaei, Y Gong, X Wang, J Zhang, L Ma, Y Yang, S Hong, J Hao, G Shi, A George, K Keyshar, P Dong, L Ge, R Vajtai, J Lou, Y Jung, P Ajayan (2015) Scalable transfer of suspended two dimensional single crystals. Nano Letters; 15: 5089.

#### **Biography**

Yung Joon Jung is a Professor at Northeastern University, Department of Mechanical and Industrial Engineering and co-faculty Director at Kostas Advanced Nano Characterization Center at Kostas Research Institute, Northeastern University. He has received PhD in Materials Engineering from Rensselaer Polytechnic Institute in 2003. He has worked as a Postdoctoral Fellow at Rensselaer and joined Northeastern University in 2005. His research focuses on investigating new synthetic routes for low dimensional nanomaterials and engineering their molecular structures. He also develops nanomanufacturing processes such as assembly and integration of nanomaterials and nanostructured architectures for nanoelectronics, flexible devices, various sensors and energy storage applications supported by National Science Foundation, Department of Defense, US Army, Ministry of Industry in Republic of Korea and other industries. He has published over 65 articles in journals and three book chapters. He is also a Co-Founder of Guradion Technologies that develops networkable high performance ion and radiation sensors.

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