ABSTRACT:

A big gap exists between the advanced nanotechnology and the macro scale applications. On the one hand, recent developments in nanomaterial synthesis and characterization have led to unprecedented material properties and device performance. On the other hand, many important applications see urgent needs for advanced material and device capabilities, and require large scale production of devices in order to make a real and significant impact. Here I present two types of material platforms that aim to bridge the nano and macro worlds: 2D materials and multimaterial multifunctional fibers. In the first part of my talk, I will discuss a CVD method for synthesizing large scale 2D materials, and introduce a unique method of modifying graphene edges for electronic applications. In the second part of my talk, I will introduce the scalable fabrication of multimaterial multifunctional fibers, and the application of these flexible fiber devices in neural engineering and tissue engineering. In particular, I will focus on the multimodality fibers for simultaneous optical, electrical, and chemical interrogation of neural circuits in vivo. This technology will allow for more detailed manipulation and analysis of the neural network in deep brain regions of behaving animals than what current technologies achieved.

BIO:

Xiaoting Jia is an assistant professor in the ECE department at Virginia Tech. Before joining Virginia Tech, she was a postdoc associate in the Research Laboratory of Electronics (RLE) at MIT. She received her Ph.D. in Materials Science and Engineering from MIT (2011), M.S. in Materials Science and Engineering from SUNY-Stony Brook (2006), and B.S. in Materials Science from Fudan University in China (2004). She authored and coauthored 23 papers published in premier journals including Science, Nature Biotechnology, Nature Communications, etc. Her papers have been cited for over 6000 times in total. Her work on nanomaterials was covered by several media outlets (Nanotechweb, Foresight, etc.). She was a recipient of Materials Research Society (MRS) Graduate Student Gold Medal (2010), and the Translational Fellow at the MIT Research Laboratory of Electronics (2013).