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Photochemically deposited nanoparticles for plasmonic-based graphene sensors

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Graphene, graphene-oxide and graphene-nanoparticle composites are being extensively explored for various electro-optical applications recently. These graphene-nanoparticle composite structures have been shown to have tunable light detection efficiencies as high as 20 times that of conventional devices. Some of the applications are highly efficient light harvesting, biochemical sensing, graphene-based photodetectors using plasmonic nanostructures etc. The main aim of the study is to produce a controllable, reproducible, direct writing process for plasmonic structures for wafer scale device fabrication. This work explores the fundamental physical & chemical processes that allow direct writing of patterned nanoparticle plasmonic nanostructures for a wide range of electro-optical device applications. A massively parallel, multi-tip arrays to demonstrate a scalable technology is achieved using a dip pen lithography. The other aim of the study is also to understand the nucleation process on the confined area defined by the interface of the water meniscus on the graphene surface and finding nanoparticle printing parameters of nanoparticle dimensions.

Biography

Savan Suri is currently a graduate student pursuing PhD in Electrical Engineering at West Virginia University, USA. His area of research is nano material & nano sensors for optical, chemical & biological applications. His expertise also includes electrochemical analysis at nano scale, photochemical deposition of nanoparticles and nano/micro fabrication techniques for plasmonic nanostructures.

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