Design and Fabrication of Organic Piezoresistive Tactile Sensor on Flexible Substrate

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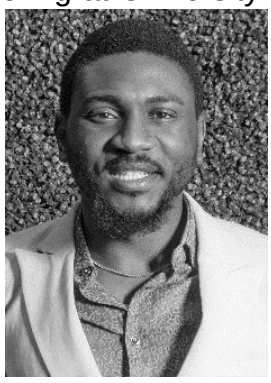
Abstract

Improving tactile perception for robotic applications is the current frontier of development for enhancing physical human robot interaction and collaboration. This involves the development of tactile sensors exhibiting piezoresistive behavior converting mechanical simulation into sensory input that can be used for manipulating robot motions and trajectories or enhance the concept of internet of things. In recent times, inkjet printing techniques have been employed to manufacture miniature circuits, components, and devices. In this presentation, we present efforts made to fabricate tactile sensor conducting lines using inkjet printing techniques delivered from the NeXus, a Novel custom-built additive manufacturing platform. We detailed the deposition process of the base sensing material, PEDOT: PSS, which is responsible for the piezoresistive phenomenon of the tactile sensors using inkjet printing techniques. Furthermore, the sensor performance is evaluated using a testing station equipped with a force load indenter and electronic circuit providing feedback of the tactile sensor's performance after a period of curing in oven at 80°C.

Biography of Presenter

Olalekan O. Olowo (Member, IEEE) received his B.Sc. in electrical & electronics engineer from Ekiti State university, Ekiti state, Nigeria in 2013 and a master's degree in electrical & electronic engineering from covenant university, Ogun state, Nigeria in 2017. Currently, he is pursuing his Ph.D. in Electrical and computer Engineering at University of Louisville, Louisville, Kentucky.



Since 2019, he has been a Graduate research assistant at the Next Generation System (NGS) group of Louisville Automation and Robotics Research Institute (LARRI). His research interest includes power system engineering, Fiber Bragg grating, Micro-nanostructures, Fabrication, and integration of robot skin sensors. He was a recipient of the Kentucky National Science Foundation EPSCOR "Mark of Distinction" Award in 2020 and "Best Research Poster" award at the 2022 NNCI Nano + Additive Manufacturing summit.