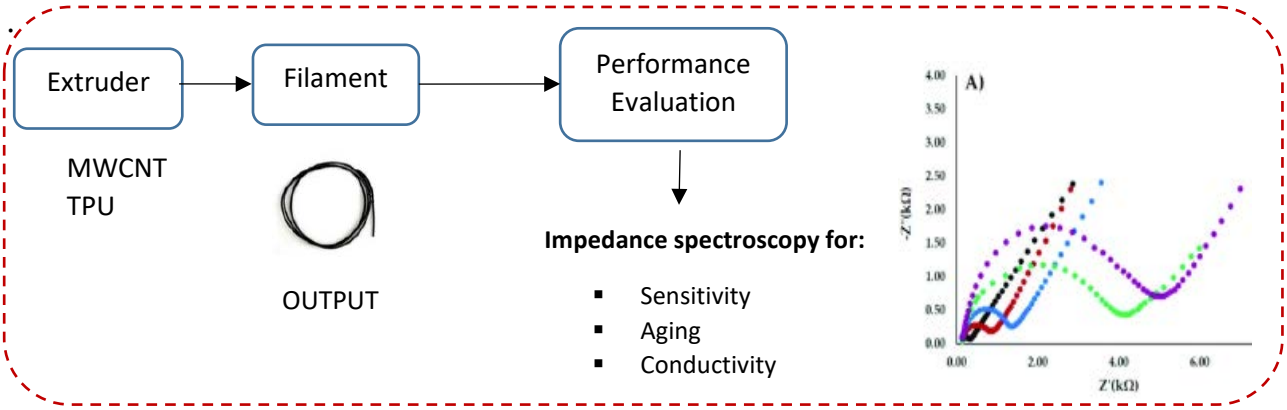
Characterization of Nanocomposite Filament Sensors with Impedance Spectroscopy

Project description:

Filament strain sensors have received significant attention in recent years due to their ability to convert physical or mechanical deformation into measurable electrical signals. These sensors are highly versatile and can be woven or embroidered into fabrics while exhibiting remarkable isotropy in strain sensing.
In recent years, researchers have employed various methods to study flexible sensors based on carbon nanomaterials. Traditional approaches have primarily relied on resistance variations for testing such sensors. However, impedance spectroscopy presents a novel and advantageous technique for gaining insights into the sensor mechanism and enhancing performance. This method offers a comprehensive understanding of the electrical properties, including resistance, capacitance, and inductance, across a broad range of frequencies.



Tasks:

Task 1: Stat of the art of nanocomposite sensor, filament strain sensor and the exciting method for characterization: Challenges and limitations of existing techniques.
Task 2: Fabrication of filament sensor using polymer/CNT and extruder.
Task 3: Characterization of several performances of the filament sensor using impedance spectroscopy.
Task 4: Data Analysis: Impedance spectroscopy data will be analyzed by ZView
Task 5: Documentation of the work.

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