Environmental Monitoring

1- Advances in Biosensing and Environmental Monitoring Based on Electrospun Nanofibers

By: Kang, SX (Kang, Shixiong) [1] ; Zhao, K (Zhao, Kun) [1] ; Yu, DG (Yu, Deng-Guang) [1] , [2] ; Zheng, XL (Zheng, Xiaolu) [1] ; Huang, CX (Huang, Caoxing) [3]

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Abstract:
Electrospun nanofibers (NFs) are directly produced by electrospinning technology. They are useful in a series of applications such as excellent performance in biosensing and environmental monitoring, due to their large specific surface area and high porosity. The wide range of materials used provide a solid foundation and core guarantee for electrospun NFs to sense, which are used in a variety of polymers, small molecules, colloidal particles, and composites. Biosensing primarily aims at small biomolecules, biomacromolecules, wearable human motion monitoring, and food safety testing. Environmental monitoring encompasses the detection of gases, humidity, volatile organic compounds, and monitoring the degradation of heavy metal ions. We aim to sort out some recent research for electrospun NFs in the sensing area, which may inspire emerging smart sensing devices and bring a novel approach for biomedical development and environmental remediation. We highlight the powerful applications of electrospun NFs in the rapidly growing field of wearable electronic devices, which may spur the industry's novel perspectives on the development of wearables. Finally, we point out some unresolved difficulties in the sensing field for electrospun NFs and propose possible and novel ideas for this development.

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3- A Low-Cost Platform for Environmental Smart Farming Monitoring System Based on IoT and UAVs

By:
Almalki, FA (Almalki, Faris A.) [1] ; Soufiene, B (Soufiene, Ben Othman) [2] ; Alsamhi, SH (Alsamhi, Saeed H.) [3] , [4] ; Sakli, H (Sakli, Hedi) [5] , [6]

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Abstract:
When integrating the Internet of Things (IoT) with Unmanned Aerial Vehicles (UAVs) occurred, tens of applications including smart agriculture have emerged to offer innovative solutions to modernize the farming sector. This paper aims to present a low-cost platform for comprehensive environmental parameter monitoring using flying IoT. This platform is deployed and tested in a real scenario on a farm in Medenine, Tunisia, in the period of March 2020 to March 2021. The experimental work fulfills the requirements of automated and real-time monitoring of the environmental parameters using both under- and aboveground sensors. These IoT sensors are on a farm collecting vast amounts of environmental data, where it is sent to ground gateways every 1 h, after which the obtained data is collected and transmitted by a drone to the cloud for storage and analysis every 12 h. This low-cost platform can help farmers, governmental, or manufacturers to predict environmental data over the geographically large farm field, which leads to enhancement in crop productivity and farm management in a cost-effective, and timely manner. Obtained experimental results infer that automated and humanmade sets of actions can be applied and/or suggested, due to the innovative integration between IoT sensors with the drone. These smart actions help in precision agriculture, which, in turn, intensely boost crop productivity, saving natural resources.