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An IoT-based Smart Health Monitoring Wheelchair System for Physically Challenged People

Theme: Biomedical Science & Technology

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technology due to its compact size and light weight. The optical fibre sensors have ability to support multiplexed and distributed sensing solution to meet the rapidly changing healthcare standard. This paper reviews the different types of sensors, their working principle, limitations and medical applications.

Keywords: Healthcare Parameters; Electronic Sensors; Optical Fiber Sensors; Wearable Sensors

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Microwave Imaging: Using Gradient Method and Biconjugate Gradient Methods for Breast Cancer Detection

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Abstract: The reconstruction problem for microwave imaging (using Tomographic method) is investigated in this work using gradient-based optimization and Biconjugate gradient-based optimization. For high-dimensional linear systems design, the incident fields can be resolved for each assessment of the cost function and its gradient, with a significant number of computations. Here we used Biconjugate gradient algorithm, with effective implementations unique to the microwave imaging context. To compare with the conventional gradient method, Biconjugate method computational time savings and get the better resolution, according to numerical experiments conducted on synthetic data set (collected from HFSS) observations. Breast models with cancerous area and without cancerous area (dielectric properties of tissues) are compared with Gradient method and Biconjugate gradient method, the results are quite similar but for Biconjugate methods the accuracy and resolution of images are high.

Keywords: Microwave Imaging; Gradient Method; Biconjugate Gradient Method; Microwave Tomography; Breast Cancer Detection

229_IEC34826 [🔗](#)

An IoT-based Smart Health Monitoring Wheelchair System for Physically Challenged People

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Abstract: The research work presents a comprehensive study on an Internet of Things (IoT)-based smart wheelchair that offers complete mobility support in addition to real-time health monitoring, AI (Artificial Intelligence)-driven illness prediction, and a facial expression detection system. In contrast to traditional wheelchairs, our technology incorporates cutting-edge biomedical sensors to continuously track vital signs like blood pressure, oxygen saturation, heart rate, body temperature, and ECG (Electrocardiogram) monitoring. Furthermore, the wheelchair integrates fall detection capabilities and tracks the user's movement patterns to improve safety.

The wheelchair has Internet of Things (IoT) capability to enable seamless and smooth data transfer to a cloud-based platform, enabling caregivers and medical professionals to connect with their patients and also to monitor them