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Patent Search

Invention Title	Cloud-Assisted IIoT Framework for Skin Cancer Detection Using Machine Learning and Mobile Imaging
Publication Number	42/2025
Publication Date	17/10/2025
Publication Type	INA
Application Number	202541087696
Application Filing Date	15/09/2025
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	BIO-MEDICAL ENGINEERING
Classification (IPC)	G16H0040670000, A61B0005000000, H04L0009400000, G16H0080000000, G16H0030200000

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Abstract:

Abstract The invention brings forward a Cloud-Assisted IIoT Framework for Skin Cancer Detection which combines mobile imaging, secure IIoT communication and cloud learning. The platform aims at offering real-time, accurate and available diagnostic assistance to detect early stage of skin cancer. Smartphones or handheld imaging dermatological images in mobile devices, which are then preprocessed and securely transmitted through IIoT-compatible gateways. The cloud infrastructure contains learning models, optimized for classification of skin lesions, and allows computationally expensive operations to be run off-device. Diagnostic recommendations are returned to the user device in near real-time, with instant feedback and suggestions for additional consultation. This solution overcomes the limitations of the current diagnostic terms of access, cost, computational capability and privacy of data. Cloud computing is utilized to reduce the mobile device processing power requirement for the invention enabling it to operate in resource-constrained locations. The application of blockchain techniques guarantees safe, authentication, and traceable transmission of medical information. Diagnostic results can be accessed by clinicians remotely, patients are monitored and interventions can be made without the need for on-site visits. The invention also achieves great advances in diagnostic efficiency, in shortening the lapse time of cancer diagnosis, and in the improvement of availability of healthcare resources, for regions with poor supply of healthcare services. It is a scalable, interoperable, and secure sharing platform for diagnostics that elevates the patients, clinicians and diagnostic technologies centrality. Through the integration of mobile imaging, IIoT and cloud-based AI, this invention represents a game-changer in worldwide skin cancer detection and healthcare advancement.

Complete Specification

Description:Cloud-Assisted IIoT Framework for Skin Cancer Detection Using Machine Learning and Mobile Imaging

Field of the Invention:

The current invention is directed to healthcare, and in particular to medical imaging, mobile diagnostics, and the Industrial Internet of Things (IIoT). A cloud-based framework that combines mobile imaging devices with machine learning-level algorithms for skin cancer detection and classification is proposed. The present invention relates to a low cost, easy-to-access and accurate diagnostic support system and method that alerts patients, healthcare professionals and organizations of the patient requiring early detection and early intervention via mobile platforms and secure IIoT communication.

Background of the Invention

Skin cancer is a common and lethal disease, diagnosed in millions of people every year throughout the world. The chance of successful treatment and survival increase significantly with early detection. Nonetheless, traditional skin cancer diagnosis is frequently dependent on in-person visits, dermoscopic images, and biopsies, which need dermatologist expertise and availability of specialized medical facilities. Such skill and infrastructure are in many places scarce in remote, or poorly developed areas resulting in late diagnosis and low survival rates. This topic describes the problems associated with access to, cost, and time for traditional diagnosis.

With the development of medical imaging and machine learning methods, it is possible to design automated diagnostic aiding systems today. Deep learning models, such as convolutional neural networks (CNN), have demonstrated good performances in skin lesion analysis, especially in differentiating between tumour malignant and benign.

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Page last updated on: 26/06/2019