

# Chapter 1

## The Panoramic Views of Cloud IoT–Based M–Health Biometrics: Introduction and Review of the Existing Literature

### ABSTRACT

*The veins-based biometric systems use the molds and patterns of the veins' images of the human body for identification in standalone systems or a cloud internet of things (IoT)-based networking environment. The beauty of using veins-based systems for identification is that the vein pattern cannot be stolen or duplicated or washed out because of its availability in the human body. Currently, vein patterns of fingers, hand, palm, heart, head, palm-dorsa, and wrist of humans are used for biometric identification purposed in cloud and IoT-based network environments. In this chapter, the authors have described different types of algorithms including parallel algorithms for identifying persons in clouds and IoT-based environments. The authors observed that many researchers have designed and developed several algorithms to improve and extract the veins patterns from different parts of the human body for identification in different types of environments including clouds and the internet of things.*

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## **INTRODUCTION**

The veins based biometric systems use the molds and patterns of veins images of the human body for identification in standalone systems or cloud Internet of Things (IoT)-based networking environment. The beauty of using veins based systems for identification is that the vein pattern cannot be stolen or duplicated or washed out because of its availability in the human body. Currently, vein patterns of fingers, hand, palm, heart, head, palm-dorsa, and wrist of humans are used for biometric identification purposed in cloud and IoT based network environments. In this chapter, the authors have described different types of algorithms including parallel algorithms for identifying persons in clouds and IoT based environments.

The authors observed that many researchers have designed and developed several algorithms to improve and extract the veins patterns from different parts of the human body for identification in different types of environments, including clouds and the IoT. Further, during the review of existing literature, the authors observed that most of the researchers have decided to use software tools such as MATLAB or C language or Python for veins' images extraction, enhancement, and matching in standalone systems and cloud / IoT based network environments. The authors also observed that many of these developed veins based identification algorithms are not optimized for hardware design purposes because the hardware resources and processing time constraints were not the priority for the researchers while they were developing veins image enhancement and feature extraction algorithms for cloud and IoT based systems. The parallel processing capability in the hardware design of veins image enhancement and feature extraction algorithms can be considered as the major advantages which can further improve the processing speed and performance of veins images based identification systems in the cloud IoT-based environment. Nevertheless, the design of parallel hardware algorithms is always challenging because of resource constraints and hardware complexity.

## **BACKGROUND OF CLOUD IoT-BASED VEIN IMNAGE ENHANCEMENT TECHNIQUES**

In the current era, security has become a primary concern for the public. Therefore, the biometric systems are increasingly gaining interest because of the easiness of technology-based individuality verification using an individual's

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