

## Chapter 10

# Blockchain Technology With the Internet of Drones (IOD) to Address Privacy and Security Issues in Disaster Management

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### **ABSTRACT**

*The portability and automation of the internet of drones (IOD) have drawn increasing attention in recent years, and it is being used in various fields (such as military, rescue and entertainment, and disaster management). Unmanned aerial vehicles (UAVs) have recently established their capacity to provide cost-effective and credible solutions for various real-world scenarios. Since security and privacy are among the main concerns for the IOD, in this chapter, the authors perform a complete analysis of security issues and solutions for IOD security, analyzing IOD-related security in disaster requirements and identifying the newest improvement in IOD security research. This analysis explores many essential security technologies emphasizing authentication mechanisms and blockchain-powered schemes. Based on a rigorous review, the authors discuss the issues faced by current approaches in disaster management and offer future IOD security research areas.*

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## **INTRODUCTION**

Natural disasters, such as earthquakes, floods, and storms, and so on, can have serious repercussions, including endangering the lives of citizens and destroying infrastructure. Furthermore, first responders face threats in the post-disaster environment in most circumstances, which makes their task much more difficult. Time is of the essence in this situation. Effective resource management and timely operational choices are critical to the success of a search and rescue mission. To effectively and promptly handle new issues and guarantee the safety of both staff and victims, decision-makers must therefore have a clear and comprehensive understanding of the situation. Blockchain and IOD together can offer integrated solutions that support decision makers with time- and life-critical decision support systems and valuable insights about the current condition.

The Internet of Drones (IOD) is a novel paradigm that uses the Internet to do various jobs in many areas by allowing a group of flying vehicles/devices to exchange information with a Ground Control Station (GCS) and one another, such as emergency response, smart agriculture, military, smart city management, surveillance, and healthcare, and, most recently, managing the COVID-19 epidemic (Ayamga, Akaba, & Nyaaba, 2021).

In the last ten years, the application of drones has expanded quickly, encompassing a range of industries such as agriculture, commerce, the military, and disaster relief and management. Unfortunately, the evidence of its application in large-scale catastrophes is currently sparse and uncertain. In the purpose of motivating and inspiring potential future work, this paper intends to assess the present drone feasibility projects and explore several problems linked to the implementation of internet of drones with blockchain in mass disasters. This study outlines the research trend of drone use in disaster relief by summarizing the findings of 31 research articles published over the past 10 years, from 2014 to 2024, using the Arksey and O'Malley framework, revised by the Joanna Briggs Institute Framework for Scoping Reviews methodology (Arksey & O'malley, 2005).

A search for literature was conducted using Google Scholars, Scopus, individual journals, grey literature, and Google search, with the content and significance of each search being evaluated. Drones have a wide range of potential uses in emergency situations. Drone applications in catastrophes are divided into four categories based on the publications that were found;

- (1) mapping or disaster relief, which has made the biggest impact,
- (2) rescue and search operations,
- (3) transportation,
- (4) training.

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