Title: Internet of Things (IoT) and blockchain-based solutions to confront COVID-19 pandemic

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Abstract:

COVID-19 pandemic, an unprecedented event that has severely affected every aspect of human civilization. From the beginning of the pandemic, the contagious nature of this virus resulted in its rapid transmission throughout the world. As a result, worldwide health organizations and governments are facing tremendous pressure to deal with the affected populations. In this demanding period, the applications of the latest technologies to prevent the spread of the virus are critical. Among various technologies, the Internet of Things (IoT) and blockchain are being used in several solutions starting from contact tracing to forecasting. The use of IoT technologies has proved to be highly effective in such a state of the pandemic. Conducting real-time health monitoring on patients or suspected cases of COVID-19, tracking medications, detecting any new suspected cases, diagnosing patients from a distance, etc. have become exclusively possible with the use of IoT technologies in this COVID-19 pandemic. On the other hand, the blockchain technology that became popular with the increase of different cryptocurrencies has seen its applications almost everywhere. The technology uses a decentralized system instead of a single point of contact, proving to be more secure than existing solutions. Blockchain-based solutions are also being used during the ongoing pandemic in various aspects for secure contact tracing, data handling, and preventing data fabrication. In this chapter, IoT and blockchain technology are discussed briefly while describing their core elements. Then, the latest solutions were presented based on these technologies in different aspects of COVID-19 pandemic prevention. These solutions mainly focus on using these technologies for remote patient monitoring, secure data handling, and telemedicine. Finally, challenges of using these technologies were discussed, and possible solutions were recommended to improve their efficacy in the future.