

Blockchain Assisted Secure Authentication Protocol for Aerial Surveillance in IoT based Smart Agriculture

Tamizharasi GS¹, Rubini P¹, K.C. Sriharipriya¹, Achyut Shankar², Bharat Bhushan³, and Abhay Bansal⁴

¹CMR University

²University of Warwick International Manufacturing Centre

³Sharda University

⁴Bennett University

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Abstract

Data acquisition, modelling and management are the three vital components of smart agriculture. Drones play a major role in this regard by capturing the detailed data using high-resolution cameras and advanced sensors. It acts as a key element driving enhancement to crop productivity, agricultural precision and many more. The data collected from the drones are at higher risk of security concerns as the process of data collection in smart agriculture involves collaboration among several entities. There is a possibility that the intruders can intentionally get in to the system and grab the data for wrong reasons. This emphasis the greater requirement for advancing the security features associated with aerial surveillance in smart agriculture. This paper presents a blockchain assisted secure two factor mutual authentication scheme for aerial surveillance security. The major contributions of this paper involve twofold: first a blockchain based secure authentication framework is provided; second, an efficient and lightweight two factor mutual authentication scheme for aerial surveillance in smart agriculture is provided. The proposed protocol is evaluated using the simulation tool called AVISPA and it is assessed for both security and performance related features. The security analysis of the proposed protocol states that this approach remains more resistant to most challenging security threats that occurs across IoT based smart agricultural systems. This protocol is also providing reduced computational cost and complexity measures in comparison the conventional approaches. A detailed comparative analysis shows that this approach provides the better results with the total computational complexity of 1.11ms.

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