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**A Study on Developing a Secure Protocol for Drone and Mailbox
Authentication**

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Abstract

The rise in demand for E-commerce has led to the emergence of increasingly complicated difficulties in last-mile delivery. In addition, clients have an expectation for firms to enhance their delivery speed while concurrently increasing the volume of orders placed. The primary issues associated with future last-mile delivery pertain to the fulfillment of customer demand, reduction of reliance on on-road vehicles, and establishment of adaptable transportation networks. When contemplating delivery options, extensive research has been conducted on the utilization of drones and traditional postal delivery systems. However, the authentication procedures exhibit distinct variations from one another. The implementation of a smart city infrastructure may give rise to concerns of security and compellability.

Hence, a proposed solution for addressing the problem involves the implementation of a secure protocol for authentication of both drones and mailboxes. The selection and implementation of elliptic curve cryptography as a protocol in limited IoT environments is driven by advancements in cryptography and the efficiency of algorithm execution. This newly designed and built protocol utilizes elliptic curve cryptography.

The examination of the testing outcomes demonstrated that the suggested protocol had the capability to address the security concerns associated with the existing protocol. Furthermore, it is capable of introducing a novel connectivity protocol between a Drone and a Mailbox systems.

Key words: Drone and Mailbox Authentication, IoT authentication