

## Advancements in Autonomous Drones for Enhanced Healthcare Logistics

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**Abstract :** Delivering essential medical supplies to rural and underserved areas is challenging due to infrastructure limitations and logistical barriers, often resulting in inefficiencies and delays. Traditional delivery methods are hindered by poor road networks, long distances, and difficult terrains, compromising timely access to vital resources, especially in emergencies. This paper introduces an autonomous drone system engineered to optimize last-mile delivery. By utilizing advanced navigation and object-detection algorithms, such as region-based convolutional neural networks (R-CNN), our drones efficiently avoid obstacles, identify safe landing zones, and adapt dynamically to varying environments. Equipped with high-precision GPS and autonomous capabilities, the drones effectively navigate complex, remote areas with minimal dependence on established infrastructure. The system includes a dedicated mobile application for secure order placement and real-time tracking, and a secure payload box with OTP verification ensures tamper-resistant delivery to authorized recipients. This project demonstrates the potential of automated drone technology in healthcare logistics, offering a scalable and eco-friendly approach to enhance accessibility and service delivery in underserved regions. By addressing logistical gaps through advanced automation, this system represents a significant advancement toward sustainable, accessible healthcare in remote areas.

**Keywords :** region-based convolutional neural network, one time password, global positioning system, autonomous drones, healthcare logistics

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