Traffic Information Exchange Network System

A novel blockchain-inspired system securely and efficiently distributes UAV traffic data across the network to enhance airspace safety and prevent data manipulation.

The unmanned aerial vehicle (UAV) density is expected to dramatically increase in the near future in metropolitan areas because of attractiveness of using UAVs to replace labor intensive tasks. There are many obstacles blocking the line of vision and signals from radar systems, thus making it difficult to ensure airspace safety. Existing and operating traffic data sharing systems for aircraft operations can potentially be used on UAVs to enhance airspace safety; however, many experts have expressed concern about the security of these systems due to lack of message encryption and message signatures. Hence, there is a need to identify ways to ensure safe operations in high-density airspaces.

Researchers at Purdue University have developed a UAV Traffic Information Exchange Network (UAV-TIEN), a novel blockchain-inspired transmission mechanism that can distribute traffic data through the whole network in a secure and efficient way. Onboard systems collect flight data from others and create a local traffic view, which records histories of communication network. The ground systems are connected to data centers that can build a global traffic view. Mechanisms within the system can prevent it from data manipulation.

Advantages:

-Secure and efficient

-Ensure air safety

-Prevents data manipulation

Potential Applications:

-UAV detect-and-avoidance systems

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