Quadcopter Implementation of an in-network Centralized Collision Avoidance Algorithm in Programmable Data Planes

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Quadcopter Scenario

Access

0-50 m
50 - 200 us

Aggregation

0-10km
2.2 ms

Core

20-40 km
3.4 ms

Remote location
9.4 ms
>10ms

External network

Remote cloud

Drone

Obstacle

Wlan/5G access

Base Station node

Transport node

Core node

Edge cloud

Core cloud

[1][2][3]
Quadcopter Scenario

Remote API

MEC

5 - 15 ms

Remote API Functions

Remote API

Remote API

Remote API

Drone
Obstacle
Wlan/5G access
Base Station node
Transport node
Core node
Edge cloud
Core cloud
Remote cloud
Quadcopter Scenario

Population Size
Homogeneity
Scalability
Environment
Bandwidth

Remote API Functions
MEC
5 - 15 ms
Remote API
Remote API
Remote API
Quadcopter Scenario

Remote API Functions

Population Size
Homogeneity
Scalability
Environment
Bandwidth

Distributed
Centralized

Drone
Obstacle
Wlan/5G access
Base Station node
Transport node
Core node
Edge cloud
Core cloud
Remote cloud
Quadcopter Scenario

Remote API Functions

MEC 5 - 15 ms

Distributed
Centralized
Centralized with P4

Population Size
Homogeneity
 Scalability
Environment
Bandwidth

Drone
Obstacle
Wlan/5G access
Base Station node
Transport node
Core node
Edge cloud
Core cloud
Remote cloud
Quadcopter Scenario

- Collision avoidance algorithm
- Path planning algorithm
Quadcopter Scenario

- **High Performance**
- **Reconfigurability**
- **Protocol Independent**
- **Closer than a MEC approach**

- **Complex Operations**
- **Limited processing**
- **Limited memory**
Drone/Remote API communication
VFH+ avoidance algorithm
References

Thank You
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