1. Introduction

- Micro Aerial Vehicles (MAVs) are small Unmanned Aerial Vehicles for
  - Mapping
  - Search and rescue
  - Surveillance
  - Transport

- Several off-the-shelf MAVs are equipped with
  - Camera
  - Global positioning system (GPS)
  - Communication modules
  - Other sensors

2. The Problem

- Improve network performance: utilise location and trajectory information of the MAVs to schedule and update routes (data paths)
- Design a routing algorithm that accounts for
  - Routing in 3-dimensional space
  - High mobility
  - Frequent topology changes

3. Route Switching (RS)

- Maintain information about the available routes from source to destination
- Switch route when current route is likely to break
- Minimise route error and re-discovery overhead at the computational cost of calculating alternate routes

Assumptions

- Destination node is stationary on ground
- Mission duration is known in advance
- Source has the location and path information of all nodes

4. Results

- Comparison between ad hoc on-demand distance vector (AODV) [3], location aided routing (LAR) [4] and RS
- Free space channel model

Pre-computed random paths

- Higher no. of hops (2-4) are required for connectivity
- Distance between sources and destination vary randomly

Mission paths

- Lower no. of hops (1-2) are required for connectivity
- Sources move away and return after following the path

5. Conclusion

- RS performs better when higher number of hops are required for connectivity
- RS outperforms LAR with 5 - 10% higher network throughput and shorter packet inter-arrival time

References


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