

Impact of Mobility on Link Quality and Packet Loss in Low-Power Radios

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ABSTRACT

Research in computing, communication, sensing, and actuation are enabling the development of large-scale micro-aerial swarms such as the ones being designed as part of the RoboBees project [3]. Applications envisioned for such swarms (such as crop pollination) typically span large areas. Individual MAVs can cover only a small portion of the full map due to the limited resources available. Therefore, it is important for MAVs to actively collaborate with each other to execute these envisioned applications. Inter-MAV communication is one prominent way to achieve such coordination.

It has been speculated that mobility changes everything in such low-power networks [2]. However, there is limited study on the impact of mobility on low-power links. Our recent study [1] suggests that mobility significantly decreases the received signal strength under certain conditions. The length of connectivity is also shorter with mobile nodes. Both these observations suggest that duty cycling and additional optimization of individual links is more detrimental to overall coordination. Therefore, our contention is that a continuous broadcast is more beneficial than saving energy by employing energy-saving mac protocols in such networks.

BODY

Continuous broadcast rather than low-power alternatives are most efficient for coordination of a swarm of micro-aerial vehicles

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