Aerial Networks

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Broad Question Topics

Use of C3 in aerial networks to enable new functionality

Definition?

- NextGen and FarGen Operations
- Deployment of UAS Aerial Networks
- High Confidence Issues in Integration of Aerial Networks
- Military vs Civil Aviation

NextGen and FarGen Operations

- Decentralized control and architectures enabled by Air-to-Air and Air-to-Ground
  - Why do we need it?
  - Latency, safety, coverage, critical controls applications
  - Market applications, incentivisation
- Military Deployment in Civil Airspace, Mixed Equipage Vehicle Models…

UAS Aerial Networks

- C2 (Beyond LOS), Configuration Issues, Rapid Safe Deployment, Common standards/Interoperability

- Mobile/Reconfigurable architectures

- New technologies, different concerns from ground based networks

- Middleware to handle physical diversity (Antennae, radio)

- SWAP

- Coordination and Safety

High Confidence Issues with Aerial Networks

- Heterogeneous, Asynchronous, Legacy systems
  - Transparency in Middleware management
  - Physical Layer cost issues need to be mitigated
  - Data service reliability
  - Cooperation, swarms
  - Mobile cloud services
  - Cognitive Networks; Integration of different layers

Keywords for Solutions

- Data and Service Reliability

- Middleware
  - Cognitive networks, Management, Fault tolerance

- Cooperation/Coordination Theory (Flocks etc.)
  - Mechanism to Incentivise formation of mobile clouds

- Technologies to utilize mobile clouds/data centre in the air

- Integration with Legacy systems