System Architecture for Autonomous Drone-based Remote Sensing

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Introduction

- Remote sensing/monitoring services
- Fully automated drone-based system
 Minimum or zero human intervention





System architecture





Manager organization



UNIVERSITY OF THESSALY

FSM





Mission Executor



Example driver program (WP based with periodic sensing)





Giorgos Polychronis



Functional testing: Field setup

- Microservices in Docker containers
- WP based scenarios
- Tests in the field





Functional testing: Simulated setup

- Microservices in Docker containers
- WP based scenarios
- Tests in simulated environment
 - Drone in a VM
 - o Ground Station in a VM
 - o Communication with ns3
 - Mockups for the
 - Weather stations
 - Hangar
 - Charger





User interface





Test scenario (simulated)





Test scenario (simulated)





Test scenario (simulated)





Event timeline (mission logs)





Drone speed & altitude (mission logs)





Conclusion

- Autonomous drone-based sensing
- Modular system architecture
 - Complete cycle of operation
 - Minimum or zero human intervention
 - Customizable

- Future work will focus on multiple drone deployment
 - Coordination
 - Multiple hangar/charger management
 - Dynamic replanning



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Thanks for watching!



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https://csl.e-ce.uth.gr/projects/pv-auto-scout

