



UAV-based inspection of critical infrastructures, through edge and cloud computing

Today only 5% of data created by Unmanned Aerial Vehicles (UAV) is processed due to bandwidth and connectivity limitations. E-FLY overcomes these limits by exploiting benefits of distributed UAV Data AI processing across UAV, Edge and Cloud, and provides a framework for UAV-based inspection of Critical Infrastructures such as gas pipelines, roads, rail, and electric lines.

Ability to exploit data gathered from UAVs will soon become an urgent need, especially in the case of critical infrastructure inspection. E-FLY uses Edge Computing as the ground-breaking technology to make this happen.

The benefits of E-FLY are twofold; for the final user, time and cost reduction is achieved by UAV based infrastructure inspection, and for the solution provider, an innovative offering is provided on top of Edge Computing targeting infrastructure operators and surveillance/inspection companies.

Infrastructure inspections are currently done either by infrastructure operators or by subcontractors and may require covering distances of thousands of kilometres, sometimes placed in difficult to access areas. Manual infrastructure inspection is error-prone and costly in terms of time.

E-FLY provides a UAV based infrastructure inspection framework, and takes advantage of Edge Computing to provide the following benefits:

- Cost and time savings
- Less time on-site due to rapid data collection
- Access to difficult to access areas
- Multiple datasets in a single one flight (visual inspection, orthophotos, etc.)
- Real-time data processing
- Automatic detection of incidents
- Simplified maintenance tasks
- Assessment of evolution of incidents
- Anticipation and early warning of possible anomalies

Benefits of E-FLY are applicable to diverse critical infrastructure inspection and surveillance cases (gas, powerlines, and roads) and other sectors (delivery and traffic control).



Competitive Advantages

- Distributed AI processing of UAV data
- Application of Edge Computing to optimise data processing velocity
- Significant reduction of costs and time for Critical Infrastructure networks inspection
- Optimised data management and analysis assessing networks constraints in real-time
- High-quality and detailed images of overhead infrastructure.



Target Markets

- Utilities and Services Companies
- Critical Infrastructure Operators/ Owners – Oil & Gas, Electricity, Railway, Roads, Water, etc.
- Delivery and Traffic Control Operators
- Managed Surveillance and Monitoring Companies.



Status/Traction

Pilot:

- Requirements gathered for a pilot focusing on the inspection of gas pipelines.

Technical solution:

- Overall E-FLY architecture defined out of existing building blocks
- Identified experimentation physical area for inspection demonstrations and objects of interest for the inspection
- Initial flights for Computer Vision training scheduled for May 20th week in Madrid (Spain)
- Progressed on Drone equipment identification and validation of LIDAR technology
- Experimentated over limited Edge devices equipped with GPUs with Azure IoT Edge and AWS Greengrass.

Business Launch:

- Business model and go-to-market strategy discussed with Aerotools, which can act both as a subcontractor or as a partner
- Cost benefit framework drafted in order to maximise project profits
- Project presented to internal business units within Atos.

Partners:

- Atos: Business Owner and Technology Provider with expertise in Distributed UAV, Edge and Cloud Computing, Computer Vision enabled detection in infrastructures, Safety warning systems for UAVs, among others
- FBK: Technology Provider with expertise in Distributed UAV, Edge, and Fog Computing
- Ferrovial: Customer contributing with requirements definition and pilot.



Road Map

2019:

- Development and integration of technical solution
- Gas pipelines inspection pilot
- Market analysis
- Development of value proposition, business model, cost structures and go-to-market strategies
- Approaching internal business units working on Utilities and Services Sectors
- Approaching customers
- Business and marketing activities including development of workshops and promotion activities to position E-FLY among its stakeholders
- Product launch.



Connect



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