



**Doctoral Thesis Proposal:** Operational analysis and sensorization for the integration of Remotely Piloted Aircraft Systems in emergency and security services.

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**Abstract:** The main purpose of this thesis is the development of procedures and techniques required for the safe integration of Remotely Piloted Aircraft Systems (RPAS) within the scope of activities regarding emergencies and security inside Comunidad Valenciana (local autonomic region). In order to fulfill this objective, two different activities are proposed:

- **Operational Safety:** in the first place, the appropriate documentation and procedures needed to perform RPAS activities while assuring appropriate levels of Operational Safety and compliance with current legislation. These activities mainly consist of the development of aeronautic documentation and the execution of the required Aeronautic Safety Assessments.
- **Application development:** once the viability of operations is guaranteed, the student will begin developing applications which, in conjunction with RPAS technology, improve the response of security and emergency services. This way, their response will be quicker, increasing decision making capabilities and situational awareness.

In order to develop these applications, different kind of sensors will be used (RGB, thermal and multispectral cameras), along with remote sensing techniques, which will be reinforced with artificial intelligence techniques, such as deep learning. This way, techniques will be developed in the categories of search and rescue activities and wildfire detection and monitoring.

In addition, the development of a fixed wing remotely piloted aircraft is foreseen. This aircraft should be able to embed all the required sensors while complying with all requirements demanded by current legislation.

**Available Means:** This thesis will be developed within a project coordinated between the UPV and Agencia Valenciana de Seguridad y Respuesta a las Emergencias (autonomical security and emergency agency). A part of this project funds is destined to pay a grant for the student as a researcher. On another hand, the student possesses the appropriate certificates needed to pilot unmanned aircraft and he is registered as a pilot in DEURPAS-UPV operator. This way, the student is able and has access to the required means (both aircraft and sensors) to perform the required research & development experimental flights in order to achieve the proposed objectives with autonomy, safety and complying with all established legal requirements.

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