

# ***Object Sniffer: Procura Remota de Objetos a partir de Dispositivos Aéreos Não-Tripulados (UAVs)***

*Proposta de Projeto*

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## **1 Objectives**

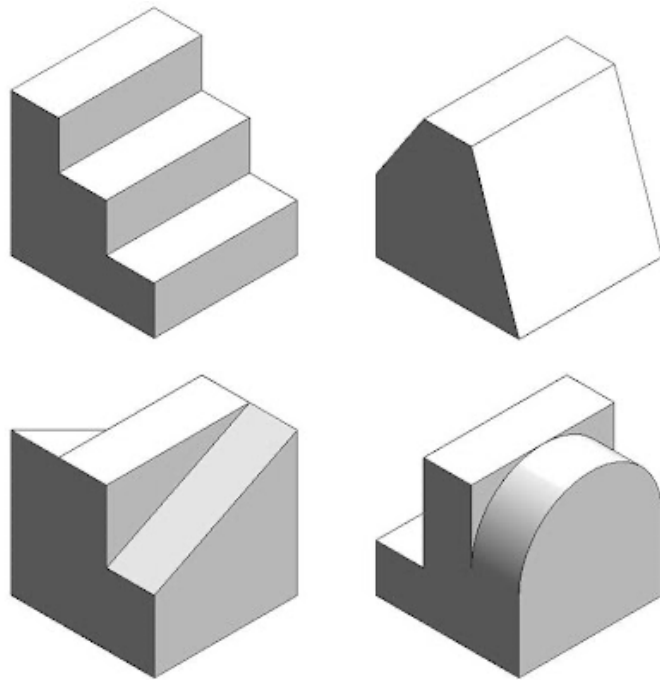
Video-based surveillance refers *the act of ‘watching a person or a place, esp. a person believed to be involved with criminal activity or a place where criminals gather’* [1]. Over the years, this technology has been used in far more applications than its roots in crime detection, such as traffic control and management of physical infrastructures.

Over the recent years, unmanned aerial vehicles (UAVs, Fig. 1) have been regarded as a potential solution to surveil public spaces, providing a cheap way for data collection, while covering large and difficult-to-reach areas. This kind of solutions can be particularly useful to detect, track and identify objects of interest in crowds, for security/safety purposes [1].



**Figure 1:** Illustration of the kind of Unmanned Aerial Vehicles (UAVs), available at the SOCIA – Soft Computing and Image Analysis Lab. for research/development purposes (DJI Phantom 4).

In particular, this project aims at the development of an atomata that – upon a multi-view image-based query of an object – searches for potential matches in an outdoor environment. It is expected that the system is able to actively redirect the data acquisition strategy with regard to the probability of matching at the different parts of the region to be scanned.



**Figure 2:** Schematic representation of a multi-view query of one object to be scanned in the scene.

## 2 Work Plan

**T1:** Analysis of the existing solutions for multi-view object detection and tracking.

**T2:** Implementation of the chosen approach.

**T3:** Debugging, tests and optimization.

**T4:** Report writing.

## 3 Academic Pre-requisites

- Interest in Machine Learning, Computer Vision and Artificial Intelligence

domains;

- Solid programming competence, preferably with expertise in Python language.

## 4 Expected Results

- One computational prototype;
- One technical report describing the work carried out.

## 5 Contacts

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## References

[1] SV Aruna Kumar, Ehsan Yaghoubi, Abhijit Das, B.S. Harish, Hugo Proença. The P-DESTRE: A Fully Annotated Dataset for Pedestrian Detection, Tracking and Short/Long-term Re-Identification from Aerial Devices. IEEE Transactions on Information Forensics and Security, vol. 16, pag. 1696-1708, doi: 10.1109/TIFS.2020.3040881, 2021.