

# Proposing a Privacy Protection Model in Case of Civilian Drone

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**Abstract**—Technology-based products are meant for improving the people's quality of life. Since drones or more precisely Unmanned Aerial Vehicle's UAVs were permitted to be used for civilian purposes and applications, many lucrative reasons such as low price, mobility and ease of deployment have captured the attention of commercial organizations. These reasons have motivated the commercial organizations to involve and adopt UAVs in their company's operational body structure which will be positively reflected on the services provided to their clients. UAVs have influential features that can be used to infringe on the privacy of individuals if they are deliberately misused, therefore the commercial organizations willingness and the precious services going to be offered to clients should not be at the cost of privacy. This research will present a privacy detection model to guarantee the success of UAV commercial adoption as well as securing the individual privacy. Proposed model will be implemented in near future to escort the privacy protection of civilian in case of commercial drone.

**Index Terms**—UAV's, Privacy, Security, Machine Learning, Detection System.

## I. INTRODUCTION

Certainly, allowing the use of drones in civilian fields will generate a favorable technological breakthrough to enhance the quality of services provided to client. This chance will open the door to a successful drone use industry of 127 billion US dollars with 100,000 predictable job opportunity by 2025 [1]. In conducting this research we found that, the UAVs usage for civilian purposes and due to their capabilities are not limited to field, environment, geographical area, or even nature of business.

### A. UAV's Capabilities:

UAVs design and features are in constant development. Periodically we hear about the addition of a new feature and function from one of UAVs manufacturers. In this section we will review some basic features which are available in each type of UAV. Sensors provide UAV stability and prevent it from hitting any obstacle not seen by the pilot. Camera have couple of purposes recording Videos-photography is one of them, while the other one offers a better view of control to the pilot by displaying captured view to his ground control station.

- Controller in real time: Global Positioning System (GPS) is used for localization and navigation. In addition, some UAVs have location registry for no-fly zone and GPS of

UAV prevent it from crossing the geo-fencing to shield the ignorant pilot from reaching a prohibited area. While barometer is used for calculating drone's altitude during flight [2].

### B. UAV's System Architecture:

UAV capabilities and features have been improved with the help of advanced connectivity and high computing power. While this improvement can be used for providing better services to societies, it can be misused as well to invade people's privacy [3].

- Flight Controller: is UAV's central processing unit. it processes the received commands from Ground Control Station (GCS) and instruct actuators to react accordingly. Flight controller process the data received from the sensors as well. Based on type of control, flight controller will forward sensor processed data to GCS or will instruct the actuators to react according to it.

- Ground Control Station (GCS): is a ground facility providing human operators with the ability to control and track UAVs while flying. GCS are of different sizes based on the UAV type and mission. A GCS to UAV interaction is maintained via a wireless connection to transmit commands and obtain data in real time.

- Data link: is a wireless connection between the drone and the GCS for the transmission of control information. UAV flights are categorized based on their distance from GCS into line of sight missions (LOS) and Beyond line of sight missions (BLOS) [4].

Low price and ease of use are factors which made UAVs approachable not to commercial entities only but to a single person running business and hobbyist as well. Other main factor which make Commercial UAVs usable in unlimited purposes is that they come with vast variety in size and weight. The most popular UAV classification is made based on weight as demonstrated in Figure 1.

## II. LITERATURE REVIEW

Researchers almost left no area without conducting a study to introduce UAVs in their fields to take the advantage of the precious benefits it may add to it. Therefore we found it useful to classify the fields that have expresses interest in drone use for civil purposes into two categories based on the privacy invasion threat level. First class is low privacy invasion where