

Predator-drone, one drone to rule them all

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Abstract—Drones are now present almost everywhere. Reserved before to military, this technology is now accessible to everyone. Their field of use is wide: surveillance, agriculture, media coverage, etc. However, some people are using them in malicious way, to spy, to bomb, etc. In this work, we developed a tool whose goal is to take control of multiples civil drones.

Index Terms—Security, UAV, Drone, Hijack, Parrot AR.Drone 2.0, Syma X5C-1, WiFi, RF 2.4 GHz, Deauth attack

I. INTRODUCTION

A. Overall introduction

Unmanned aerial vehicles (UAV), commonly known as drones, are aircrafts without human pilot aboard. An UAV is a component of an unmanned aircraft system (UAS), which include an UAV, a ground-based controller and a communication system between the two. However, many UAVs can take certain decisions autonomously during their flight.

These systems were originally developed by military and used in too dangerous missions for humans. In the past few years, their use became generalized to many sectors such as academic, commercial, and even recreational. As concrete examples, drones are now used for surveillance, agriculture and aerial photography.

Their field of use is continuously growing. As an example, Amazon is working on drones to be used for their deliveries: the future Amazon Prime Air service. Amazon managed to perform its first fully autonomous delivery on December 7, 2016 [1].

B. Motivation of this work

The use cases stated before are mostly advantageous for our society. Yet, malicious usages also exists. A first concrete example is the recreational drone use by Daesh to bomb on Syrian frontline [2]. Another one, more recent, is the flight over London Gatwick airport by a non-identified drone, which caused a blockage of the whole airport [3].

Thereby, it is necessary to protect from these threats. Military has developed solutions, such as control link jamming. The DroneGun, constructed by DroneShield [4], is a great example. Nevertheless, such solutions do not exist for civilians.

We could think on making military solutions accessible publicly, but these solutions often take down the drone, without considering the final state of the drone. This means that these solutions can cause a crash. This is not acceptable for civilians. As an example, we could think of a drone fighting over a crowd, that a crash would harm.

C. Our goals

The objective of this work is to develop a tool able to take control of multiple commercial drones, without implying their

crash. This tool will be embedded on a predator drone that will cover a restricted flying zone.

In our study, we focused on two commercial drones: the Parrot AR.Drone 2.0 and the Syma X5C-1. Then, we addressed the embedding question on a predator drone.

II. HIJACKING A PARROT AR.DRONE

III. HIJACKING A SYMA X5C-1

IV. EMBEDDING TOOL ON A PREDATOR DRONE

V. CONCLUSION AND FUTURE APPLICATIONS

REFERENCES

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