Bilkent University

CS 491

Project Specifications Report

Supervisor:

Varol Akman

Jury Members:

Cigdem Gunduz Demir

Ibrahim Korpeoglu

Innovation Expert:

Mustafa Sakalsız

Drector

Shahriyar Mammadli

Nihad Azimli

Burak Özmen

Veysel Alperen Ceylan

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1 Introduction

Lately drones and quad copters started to get huge part of people's live in general. Almost in every industry people use drones or quad copters for different purposes. Such as, for different sport event recording, daily use for fun, spying for military industry, logistics through drones to reduce costs and so on. Additionally, usage of these flying objects is increasing day by day in vast level. However, there is no mechanism to get information about the objects flying around us. As stated above, drones can be used for multiple purposes, these purposes consist of both good and bad ones. Therefore, there is demand for registering drones or keep information about them. It is fact that governments want to learn specifications of unknown drones. Even more, anyone has right to learn about undefined flying object around him/her. Unfortunately, there is no way to get information about them. We plan to develop mobile application that will solve this worldwide issue. This cross-platform application will show in-demand information about drones and quad-copters.

1.1 Description

Drector is a mobile application to keep track of drones and quad copters that surrounds you. The aim of application is reaching the information about drone or quad copter. Firstly when user launch the application user will encounter map where he/she can see the drones or quadcopters that is nearby. By clicking the little icon of each drone user can reach information about that drone. This information consists of different things, such as name of drone, name of owner, cause of flight, specifications of drone (this information is optional owner of drone may choose to hide or show some of them). Also, user can view drones around him/her and get information instantly by camera of the phone. Such that, user can convert application to camera mode instead of map mode. In camera mode user can direct his/her camera to the drone and after this application detects drone that is flying, user can inspect drone in detailed way.

1.2 Constraints

1.2.1 Economic Constraints

The application will be on both App Store and Google Play Market for no price. Some amount of money will be paid to publish this application on both markets. Indeed, we will

not pay for any development of software, we will use open-source communities and environments. Cost of GPS chips will be covered by companies.

1.2.2SocialConstraints

Some people tend to hide their actions through drones. However, this group of people are mainly the ones whose purpose is wicked actions. Indeed, our objective is limit this kind of actions.

1.2.3 Language Constraints

Our application will be released in English for now; but according to demand of the application, other languages may be added.

1.2.4Technological Constraints

Our application will be compatible with any device such as tablets, smart phones that has Android Operating System or iOS. Also, application needs Internet connection to run properly.

1.2.5Ethical Constraints

As mentioned above, some special information will be private according to the choice of user and the owner of drones. However, some information cannot be private as we aim to publicize undefined flying objects.

1.2.6 Timing Constraints

The application will be fully implemented and tested by the end of spring 2018 semester.

1.3 Professional and Ethical Issues

It is our responsibility as engineers to understand the capacity of the resources and respect them by maintaining a realistic approach by proper planning and allocation of resources during the project. This testifies to the recognition of respect, as well as the fulfilment of our professional duties to our professional colleagues. Covering a wide variety, preventing cultural shock, taking into account cultural differences, using a clear communication scheme, discussing cultural differences in meetings, observing the rules of the country in which the project is being implemented and defining cultural differences between team members, some of the ways to reduce the negative impact of cultural differences on the project. When dealing with conflicts or project problems that arise during the project, our task is to analyze the root cause of the problem and solve it in the interests of the project goal. Moreover, as engineers, it is important to understand the copyright law

of any material with which we work. Conflicts inevitably arise during any project, and we are responsible for fairness in conflicts. There may be a conflict between the members of the project team who may have to act as arbitrators to resolve conflicts for other people. At all times, we must always determine the main cause of the conflict and fight it to avoid recurrence. We should never use our power and influence to resolve conflicts in favour of any group. As professionals, no one should discriminate against others. All project participants and team members should treat fairly and equity on the part of each partner. Honesty can be defined as our ability to understand and accept actions based on truth. Our professional responsibility is always to try to understand the truth. We often act on the basis of information that we receive without cross-checking, if they are true or not. The desire to understand the truth involves verifying the truth. If some of the information we have is not properly verified, they can be counterproductive, which adversely affects the success of the project. As a conclusion, respect, responsibility, fairness and honesty are four basic professional practices and ethics. It is expected that we will do the right thing and get down to the right process. We must learn to get away from projects that deny our professional ethics, and we must also warn each other when we discover actions that are not professional.

2 Requirements

2.1 Business and Functional Requirements

- Using GPS tracing drones, getting their information by a reader, transfer to database, and display it in app.
- App should detect drone by camera and determine which drone is this by checking database.
- To be able to track closest drone in certain direction. It means, as an example, if reader is in direction of 300° NW, reader must find nearest drone in that direction.
- If, by coincidence, there exist more than one drone in specific direction that override, because it is hard to find exact altitude by GPS, information about all drones must be outputted.
- Distance of the drone that detected by application, must be outputted.

2.2 Design Requirements

- GPS chips will be located in drones (if they already have not), and by the help of reader, information about them will be transferred to database.
- An application will be developed to get information about a drone.
- Image processing will be used to detect drone by phone camera.
- After detection of drone in app software calculation will produce and find the data of drone.
- Software will be built to calculate distance of a certain drone.

2.3 Project Phases

- First step is to read drone information, and identify them.
- Second step is to keep them in database.
- Third step is to develop software that determines drones by phone camera.
- Fourth step is to build software that detects correct drone and gets its information.
- Last step is to develop software that calculates distance of drone.

2.4 Test Plans

Project will be tested by using necessary testing methods and those will include unit testing, integration testing, system testing, survivability testing and may be some other testing methods during the process of development.

2.5 Completion

In order to be regarded successful, the project must also be finished within the budgeted time and cost.

3 References

"ACM Code of Ethics and Professional Conduct." Association for Computing Machinery. Accessed October 11, 2017. http://www.acm.org/about-acm/acm-code-of-ethics-and-professional-conduct.