**A Project Based Seminar Report**

**on**

“**Last Mile Drone Delivery by Autonomous Drones”**

Submitted to the

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In partial fulfillment for the award of the Degree of

Bachelor of Engineering

in

Information Technology

by

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**CERTIFICATE**

This is to certify that the project based seminar report entitled **“Last mile Drone Delivery by**

**Autonomous Drones”** being submitted by **Pallavi Dadape (71829039K)** is a record of bonafide work carried out by him/her under the supervision and guidance of **Prof. K. A. Sultanpure** in partial fulfillment of the requirement for **TE (Information Technology Engineering) – 2015 course** of Savitribai Phule Pune University, Pune in the academic year 2019-20.

Date: / /2020

Place: Pune

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Internal Examiner External Examiner

I

**ACKNOWLEDGEMENT**

Purpose of acknowledgements page is to show appreciation to those who contributed in conducting this dissertation work / other tasks and duties related to the report writing. Therefore when writing acknowledgements page you should carefully consider everyone who helped during research process and show appreciation in the order of relevance. In this regard it is suitable to show appreciation in brief manner instead of using strong emotional phrases.

In this part of your work it is normal to use personal pronouns like “I, my, me” while in the rest of the report this articulation is not recommended. Even when acknowledging family members and friends make sure of using the wording of a relatively formal register. The list of the persons you should acknowledged, includes guide (main and second), academic staff in your department, technical staff, reviewers, companies, family and friends.

You should acknowledge all sources of funding. It’s usually speciﬁc naming the person and the type of help you received. For example, an advisor who helped you conceptualize the project, someone who helped with the actual building or procedures used to complete the project, someone who helped with computer knowledge, someone who provided raw materials for the project, etc.

( Individual Student Name & Signature)

II

**Abstract**

Rapid technological developments in autonomous unmanned aerial vehicles (UAV or drones)

and an evolving legislation may soon open the way for their large-scale implementation in the

last mile delivery of products.

The use of drones could drastically decrease labor costs and has been hyped as a potential disruptor to the parcel delivery industry. Online retailers and delivery companies such as Amazon,

are already filling up patents for the development of multi-level fulfillment centers for unmanned

aerial vehicles or “drone-bee hives” that would allow the deployment of this technology within

the built environment.

A substantial amount of research has been carried out in the last years on the potential use of

drones for parcel delivery, principally in the area of logistic optimization. The idea of using

Unmanned Aerial Vehicles, or drones, for last mile delivery is gaining popularity. The use of

drones to deliver parcels may have the potential to decrease delivery costs, having no driver or

truck costs, eliminating congestion costs, having less missed-deliveries due to the very short

delay, e.g. 30 min between item dispatch and delivery, and is now the object of intense research

activities.

II

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**CHAPTER I**

**INTRODUCTION TO PROJECT TOPIC**

1. Introduction to Project

Project is designed to provide last mile delivery of the products through drones which includes

delivery of the products at the door step in the multi-storey buildings. The Drone will be full

autonomous through out the delivery process and can be released to delivery by any method.

Drones are comprised with features like location tracking using GPS (Global Positioning Sys-

tem), Path Detection Techniques ,obstacle avoidance techniques.

Users are asked to enter the flat no, floor number and their GPS co-ordinates then these co-

ordinates i.e (latitude and longitude) are passed in GCS (Ground Control System) and QR code

will get generated on the user’s device after reaching the location the drone will look for the

stairs in the building using random exploratory algorithms and use real-time object detection

algorithm to look for floor number and then go through stairs mentioned by the user and will

look for the respective floor.

After reaching the floor the drones will scan the flat no mentioned on the door using object

recognition and will notify the user about his/her delivery and then drone will scan the QR

code generated on the user’s device and then drop the delivery after it’s authentication. Drones

will memorize the path and will return through the incoming path mapping algorithms.

Since we are not going to get separate project report from the students, it is good to have one or two pages common for all the students of that project. Once this project introduction and aim objectives of explained, students can start with actual seminar content writing.

* 1. Motivation behind project topic

These are some of the main motivations behind this project:

1.) Reduced cost for delivery

In regular modes of transportation, there is labor cost included. This not only increases the cost of delivery but also adds on risk for delivery. But using drones, the only human labor required will be for operational maintenance of the system. Another driving factor is fuel consumption. The traditional methods of land transport consume a lot fuel but using drones the fuel consumption is eliminated. This conserves non-renewable energy as we can use solar power to generate electricity for drones and hence decrease the operational cost.

2.) Fastest delivery system till date

Using regular modes of transportation, there can come many circumstances like traffic jam which can cause delayed delivery. But using air way for drones eliminates the factor of traffic jam using land transportation. Hence, delivery the package as faster than traditional land transportation.

3.) Convenience of consumer

Once the product is received at the center, it can be delivered as soon as possible or as per the requirement of the consumer. Another important point is that the drone system can function on time sets. If a delivery is scheduled at 4pm, the package will be successfully delivered on time without any delay.

* 1. Aim and Objective(s) of the work

**Project aim**

The aim of this project is to provide more faster and cost efficient package delivery. This project reduces the excessive cost caused by land transport.

**Project objectives**

1.) To provide autonomous drone system.

2.) To use most efficient and algorithms for path detection and object detection.

3.) To provide Last mile ,means door step delivery for the customer.

4.) To provide QR code scanning system for more security and convenience of the customer.

5.) To provide a fastest and environmental friendly package delivery.

* 1. Introduction to QR Code Detection

A QR code (Quick Response code) is a type of matrix barcode first designed for the automotive industry. The system has become popular outside the industry due to its fast readability and large storage capacity compared to traditional UPC barcodes.

This research focuses on the theoretical aspect relevant to the QR Code studying. This study involves features of QR Codes and its implementation.

**CHAPTER II**

**DETAILED OVERVIEW OF QR CODE SCANNING**

2.1 Introduction to QR Codes

A Quick Response code (called as QR Code) is a 2-Dimension Barcode which is specifically designed to be read using any kind of cameras. The QR code is a simple way to access a web address or URL. A QR code is an image file (it can be a png, jpg, etc.) that when scanned by a QR Code reader or scanner will access the URL linked to it to open up the web page.

There are 8 different parts to a QR Code which are as mentioned below:-

a) Position patterns: QR Code consists of 3 squares present at three corner of the symbol. These squares detect the position and size of the code. It tells about the code that it is QR code or not.

b) Separators: These are white pixels of width one around the position patterns to help them distinguish from data part.

c) Timing patterns: It consists of white and black modules placed alternatively between two position patterns. It helps in determining the central coordinate of each cell in the code. It tracks the time of incoming code.

d) Alignment pattern: This pattern is used to correct distortion occurred during capturing the code.

e) Data: It is the area of QR Code where data is stored after encoding. It also includes Reed-Solomon codes to provide error correction functionalities.

f) Quiet zone: It is the margin space around the code to detect it properly. At least 4 bits are needed for quiet zone.

g) Version Information: These bits tell the version of QR Code out of 40 versions.

h) Format Information: It consists of 15 bits next to the separators and stores information regarding the error correction level and selected mask pattern of code. This section consists of 15 bits and contains the error correction rate and the selected mask pattern of the QR code. When QR code is decoded, it is read first.

2.2 Types of QR Codes

A QR Code basically consists of black boxes on white background. There are many types of QR Codes mentioned below:-

a) QR Code Model 1 and Model 2:

Model 1 is the original QR Code which is capable of coding 1,167 numericals with a maximum version of 14 i.e. 73 x 73 modules.

Whereas Model 2 is just an improved version of Model 1. This code can be read smoothly even if it is distorted. Despite the code being printed on curved surfaces or for a disturbed angle of scanning, this code can be efficiently read by referring to the alignment pattern embedded in the code. This code is capable of coding 7,089 numericals with a maximum version of 40 i.e. 177 x 177 modules.

b) Micro QR Code:

A Micro QR Code differs from the traditional QR Code. The traditional QR code requires the entire code to be scanned whereas a Micro QR Code requires only one position of the pattern to detect. His makes it simpler to encode data in it. This type of code is capable of coding 4 versions from 11 x 11 modules to 17 x 17 modules.

c) iQR Code:

iQR matrix-type 2D code promotes easy reading of position and size. The code can be printed in many ways like a black-and-white inversion code, dot pattern code, rectangular code, turned-over codes , which allows the code to be off various sizes (smaller than traditional or Micro QR codes or even larger than the ones which actually store a lot off data).

d) SQRC:

A QR Code carries two types of data – private and public. To make any information as private, it needs to be hid with a cryptographic key. Then, restrict the types of devices that can read the information, so only certain devices and people can read it.

**CHAPTER III**

**LITERATURE SURVEY**

**CHAPTER IV**

**APPLICATIONS**

**CHAPTER V**

**CONCLUSION**

Conclusions usually serve two functions. The first is to summarize and bring together the main areas covered in the writing, which might be called "looking back“ . The second is to give a final comment of your seminar.

For example your could say this seminar is undertaken to explain...... and evaluate ..... . This study has found that generally ....... . Or In this seminar we …………..

**REFERENCES**

List all the material used from various sources for making this project proposals

[1] Journal article – A. A. Author of article. "Title of article," Title of Journal, vol. #, no. #, pp. page number/s, Month year.

[2] Books- Author's last name, first initial. (Publication date). Book title. Additional information. City of publication: Publishing company.

[3] Magazine - Author's last name, first initial. (Publication date). Article title. Periodical title, volume number(issue number if available), inclusive pages

[4] Website or Webpage Author's name. (Date of publication). Title of article. Title of Periodical, volume number, Retrieved month day, year, from full URL