

INDIAN INSTITUTE OF ENGINEERING
SCIENCE AND TECHNOLOGY, SHIBPUR
Howrah, West Bengal, India - 711103

DEPARTMENT OF COMPUTER SCIENCE
AND TECHNOLOGY



A MINI-PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS

ON

”MINI PROJECT TITLE”

SUBMITTED BY

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UNDER THE GUIDANCE OF

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(Academic Year: 2020-2021)

**INDIAN INSTITUTE OF ENGINEERING
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Certificate

It is certified hereby that this report, titled *whatever the title is*, and all the attached documents herewith are authentic records of Abhinaba Chowdhury (510519007), Abhiroop Mukherjee (510510109), Debarghya Dey (510519087), Jyotiprakash Roy (510519016), and Shrutanten (510519048) from the Prestigious Department of Computer Science And Technology of the Distinguished and Respected IEST Shibpur under my guidance.

The works of these students are satisfies all the requirements for which it is submitted. To the extent of my knowledge, it has not been submitted to any different institutions for the awards of degree/diploma.

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ACKNOWLEDGEMENT

We, as the students of IEST, consider ourselves honoured to be working with Dr. Samit Biswas. The success of this project would not have been possible without his useful insights, appropriate guidance and necessary criticism.

We would pass our token of token of gratitude to the Department of Computer Science And Technology as well for providing us with the opportunity to be able to tackle real world problems while improving our problem solving ability and thinking capacity by organising this project. We all have learnt quite a handful of new skills and are eager to use them henceforth as well.

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1 INTRODUCTION

1.1 Motivation

Coronaviruses are a group of related RNA viruses that cause diseases in mammals and birds. In humans and birds, they cause respiratory tract infections that can range from mild to lethal. Mild illnesses in humans include some cases of the common cold (which is also caused by other viruses, predominantly rhinoviruses), while more lethal varieties can cause SARS, MERS, and COVID-19.

With the increase in the spread of the dangerous and highly contagious **Novel Coronavirus** and the underlying disease caused by it, **COVID-19**, it is a requirement now more than ever to follow the social distancing norms set in place by the scientists and researchers.

But as we all know, India is a country with a not-so-small population, so it is pretty understandable and obvious that the law enforcement will not be able to actually enforce it on every single person. Therefore, new means of automata in place of actual individuals is a no brainier.

That is where we come in.

1.2 The Idea Behind The Project

The idea behind the working of this software was simple. The software just needed to be able to look at a live feed (or recorded footage) of a camera and know which of the people present in the footage are actually following the social distancing norms and which of them are not, and mark either one appropriately. That is where our journey to build a social distance checker started.

// will add more later probably lul

2 PREREQUISITES

2.1 Outdoor Requirements

It is important to mention here that this is not a portable software that can be fed any footage and just be expected to work. There need to be some calibration measures taken to actually get this software working:

- Actually knowing the local social distancing norms
 - The minimum distance set for social distancing by the local government
- Finding a good position for the camera
 - The footage needs to be taken from a high enough place
- Knowing the required distance in pixels
 - This will depend on the position and angle of the camera's view

2.2 Hardware and Software Requirements

The tools used to build this software are platform independent. However, there are a few requirements needed to be fulfilled to get the program working. These are:

- Software Requirements
 - Python - 3.5 or above
 - OpenCV-Python - version 2 or above
 - YOLOv3 Configuration and Network Weights
 - Numpy
- Hardware Requirements
 - A GPU is optional yet recommended to get the best performance
 - If a GPU is not being used, the CPU need to be good enough

3 THE PROJECT

3.1 Software Used

The softwares used to build this *checker* are:

3.1.1 An Integrated Development Environment (IDE)

An integrated development environment (IDE) is a software application that provides comprehensive facilities to computer programmers for software development. An IDE normally consists of at least a source code editor, build automation tools and a debugger. Some IDEs contain the necessary compiler, interpreter, or both; others, do not.

3.1.2 Python

Python is an interpreted, high-level and general-purpose programming language. Python's design philosophy emphasizes code readability with its notable use of significant whitespace. Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

Why did we choose Python?

1. Python has an upper hand when it comes to software based on image recognition and object detection. Since it is the main objective of the project, choosing python was a given. Python has an upper hand when it comes to software based on image recognition and object detection. Since it is the main objective of the project, choosing python was a given.
2. Python is unbeaten when it comes to Machine Learning. Python has support for myriad machine learning libraries, such as OpenCV, the one being used here.
3. Python is comparatively easier to understand and learn. The syntax is clear and simple to read and write.
4. And just our overall experience of using python for years.