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IT SERVICES INDIA

i-Mobilithon - 2021

Vehicle detection with safety alarm in foggy weather

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Agenda

- Problem Statement
- Introduction, Objective, Safety, Accident rate and Driver assistance
- System articheture and Technology stack/components
- Methodology, Prototype Demo
- Future scope, Benefits and Conclusion

Problem Statement

Problem Statement : Design a system that performs vehicle detection in foggy weather as it is a great challenge to detect vehicles under various foggy climatic/Heavy rainfall scenarios. There is extremely dense road traffic during foggy weather also rush hours often becomes the reason for fatal car accidents.

Introduction

- In recent years, autonomous/self-driving cars have drawn much interest as a topic of research for both academia and industry. For a car to be a truly autonomous, it must make sense of the environment through which it is driving.
- Image processing is the process of transforming an image into a digital form and performing certain operations to get some useful information from it.
- For Future scope : RADAR sensing is a wireless sensing technology that extracts and discovers the target's position, shape, motion characteristics and motion trajectory by analyzing the received target echo characteristics.

Objective

- To propose a technique which detect vehicle in foggy environment as it is important because poor visibility is the major reason of the accidents and collision of vehicle.

- To obtain an effective visual detection of vehicle such as System assists you in specific situation with speed adjustment by giving alert to avoid accidents.

Safety

- Unfortunately, India is on the top in road fatalities and it's share is 11% in the world.
- India recorded 53 accidents and 17 deaths per hour in 2020.
- Now-a-days when you visit to the hospital, you will find that every third person is a victim of road accident. Due to road accident, whole family suffers the consequences along with victim. Despite of imposing various rules and penalties on drunken driving, overspeeding and rash driving, these problems persists. This problem is getting worse year by year.
- One of the major reasons for road accidents is Heavy rainfall / foggy weather or problems in night vision.


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Accidents by weather condition

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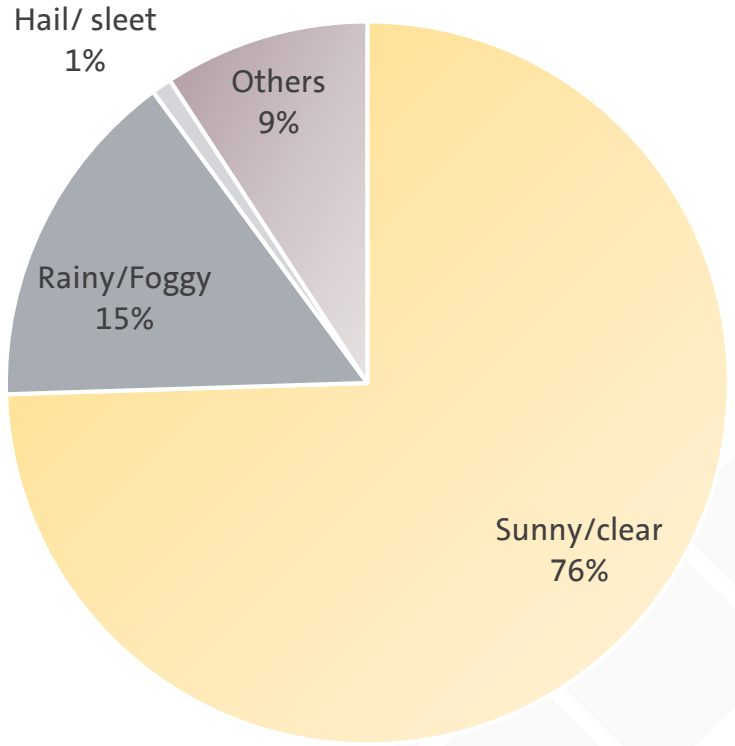
- Road accidents data in % due to different weather conditions for Year 2020 :



Reference : https://morth.nic.in/sites/default/files/RA_Uploading.pdf

Accident Rate

Over 10,000 lives lost in fog-related road crashes

Priya Kapoor / TIMESOFINDIA.COM / Updated: Jan 5, 2019, 09:05 IST

FACEBOOK TWITTER LINKEDIN EMAIL

ARTICLES

Over 10,000 lives lost in fog-related road crashes

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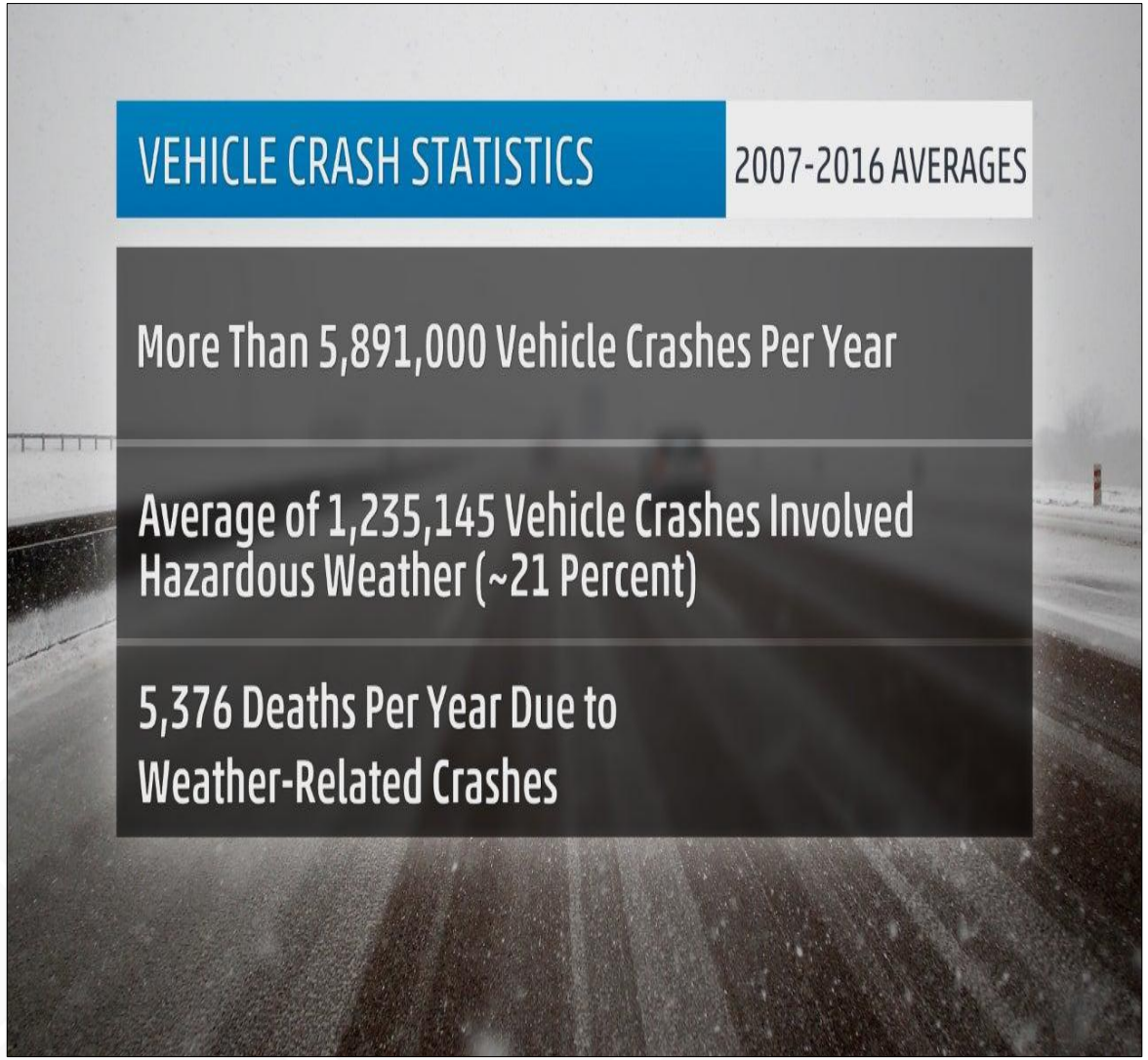
KEY HIGHLIGHTS

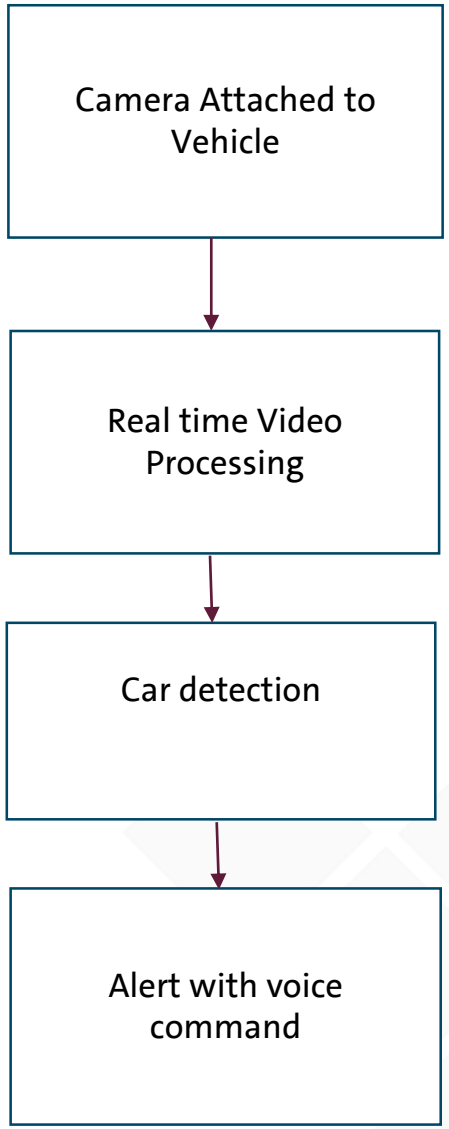


Reference : https://timesofindia.indiatimes.com/india/over-10000-lives-lost-in-fog-related-road-crashes/articleshow/67391588.cms

Driver assistance

- To avoid road accidents due to heavy rainfall, foggy weather we can provide a functionality in car itself for “Driver assistance” which will give alerts to driver to reduce speed or stop car.

System Architecture



Technology Stack / Components

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1.Technologies :

a) Python 3.9

b) Open CV

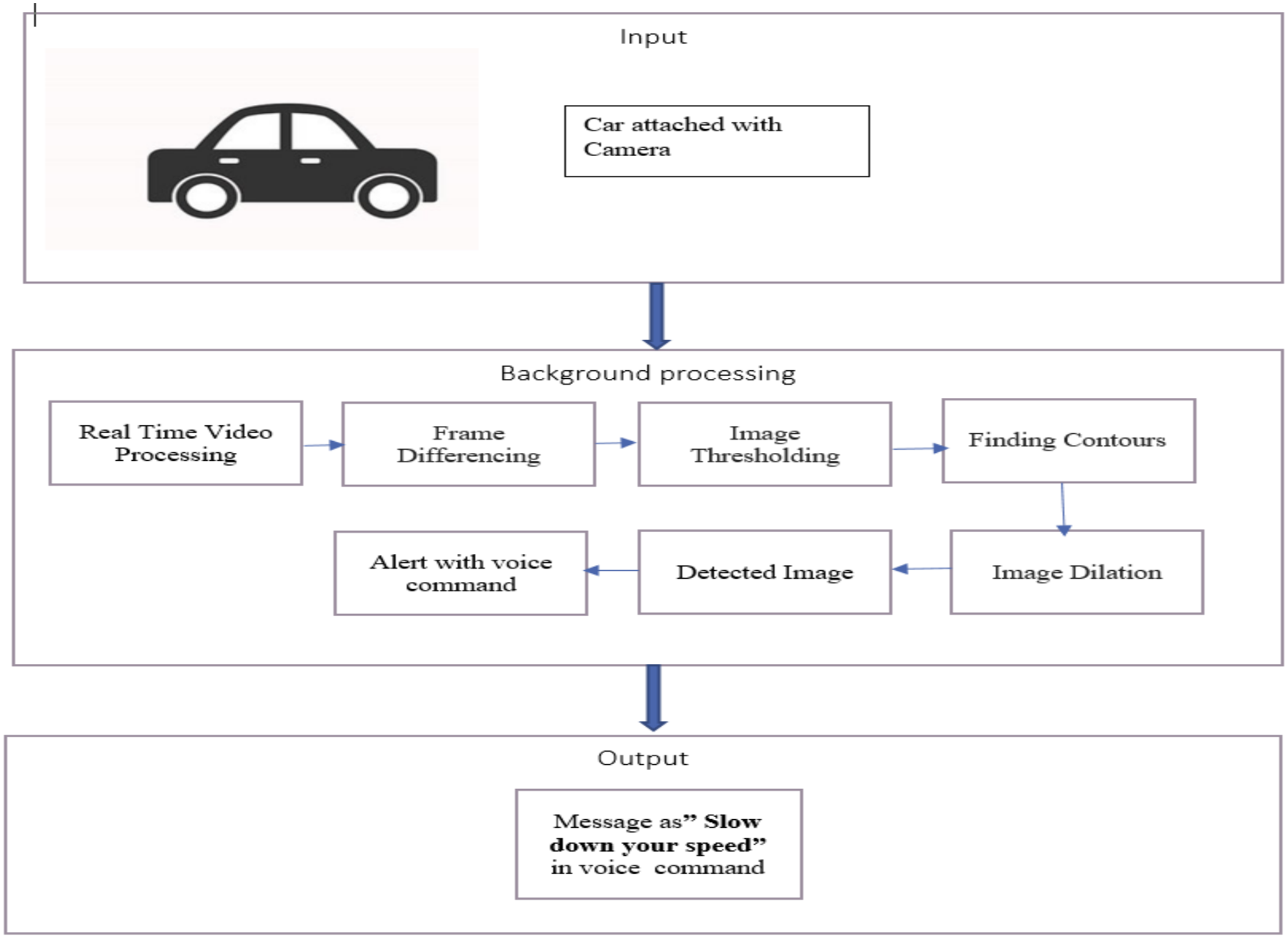
c) NumPy

d) gtts

2. Components :

a) Camera

Methodology



Prototype Demo

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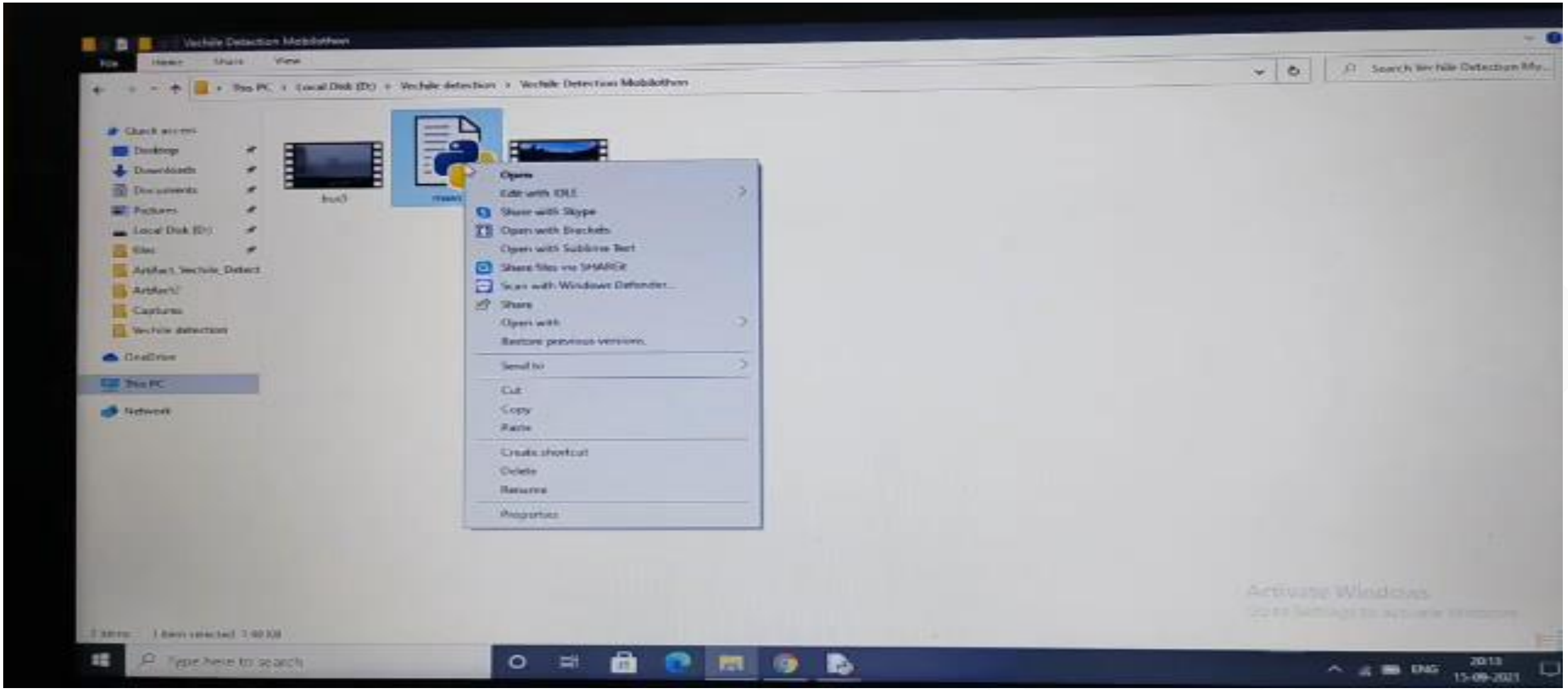

Benefits

- No accidents in foggy climatic / Heavy rainfall scenarios.
- Advice on implicit speed limit.

Future scope

- Using Combination of RADAR Sensor and Camera with image processing, we can display speed suggestion.
- Using RADAR Sensors automatic switching ON fog lamps and parking light in foggy /Heavy rainfall weather.
- Using RADAR Sensors displaying alerts on Highways.

Conclusion

- By using Camera with image/video processing to detect vehicle in foggy environment.
- Effective visual detection of vehicle such as System assists you in specific situation with speed adjustment by giving alert to avoid accidents.

THANK YOU