

# ADAPTIVE TRAFFIC LIGHT CONTROL SYSTEM

**PROJECT GUIDE**  
PROF.SUNIL KATKAR

**PROJECT MEMBERS**  
KUNAL MORE (14)  
ANKIT PATIL(23)  
YADNIT PATIL(24)

# PROBLEM STATEMENT:-

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- ❑ Traffic nowadays are increasing rapidly in cities due to which there is lots of traffic during peak hours
- ❑ The conventional traffic light system isn't optimized to control traffic during peak hours
- ❑ To overcome this problem adaptive traffic lights system can be used

# Abstract:-

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In recent years, with increase in the number of vehicles, more and more traffic issues are becoming the focus of attention worldwide. One of the most important problems is traffic congestion. Currently, most traffic systems still use fixed-time setting for a very long cycle. These systems cannot dynamically adjust traffic light timing in response to unexpected situations such as traffic accidents, natural calamities, or sudden incidents. With advances in technology, traffic data such as traffic volume, speed, and waiting time can now be gathered by sensors or cameras. Leveraging on automatic traffic data collection we try to address the traffic congestion issue by proposing a ml model based on counting the frequency of incoming traffic and adjust signal timer accordingly and for emergency situations for ambulances it clears that lane.

# What is machine learning

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- Two definitions of Machine Learning are offered. Arthur Samuel described it as: “the field of study that gives computers the ability to learn without being explicitly programmed.”
- Tom Mitchell provides a more modern definition: “A computer program is said to learn from experience  $E$  with respect to some class of tasks  $T$  and performance measure  $P$ , if its performance at tasks in  $T$ , as measured by  $P$ , improves with experience  $E$ .”

# TYPES OF MACHINE LEARNING

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- SUPERVISED MACHINE LEARNING
- UNSUPERVISED MACHINE LEARNING
- REINFORCEMENT MACHINE LEARNING

# Supervised Machine Learning

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- The majority of practical machine learning uses supervised learning.
- Supervised learning is where you have input variables ( $x$ ) and an output variable ( $Y$ ) and you use an algorithm to learn the mapping function from the input to the output.
- $Y = f(X)$
- The goal is to approximate the mapping function so well that when you have new input data ( $x$ ) that you can predict the output variables ( $Y$ ) for that data.
- It is called supervised learning because the process of an algorithm learning from the training dataset can be thought of as a teacher supervising the learning process. We know the correct answers, the algorithm iteratively makes predictions on the training data and is corrected by the teacher. Learning stops when the algorithm achieves an acceptable level of performance.

# Application Of Machine Learning

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- Image detection
- Image classification
- Video surveillance

# WHAT IS IMAGE DETECTION?

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Image or Object Detection is a computer technology that processes the image and detects objects in it. People often confuse Image Detection with Image Classification. Although the difference is rather clear. If you need to classify image items, you use Classification. But if you just need to locate them, for example, find out the number of objects in the picture, you should use Image Detection.



# WHAT IS IMAGE CLASSIFICATION?

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It is a process of labeling objects in the image – sorting them by certain classes. For example, ask Google to find pictures of dogs and the network will fetch you hundreds of photos, illustrations and even drawings with dogs. It is a more advanced version of Image Detection – now the neural network has to process different images with different objects, detect them and classify by the type of the item on the picture.

# WHAT IS IMAGE RECOGNITION?

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Image recognition is the ability of AI to detect the object, classify, and recognize it. The last step is close to the human level of image processing. The best example of image recognition solutions is the face recognition – say, to unblock your smartphone you have to let it scan your face. So first of all, the system has to detect the face, then classify it as a human face and only then decide if it belongs to the owner of the smartphone. As you can see, it is a rather complicated process.

# STEPS FOR IMAGE DETECTION

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1. Gathering data
2. Labeling data
3. Generate TF records
4. Configuring training
5. Training model
6. Testing model

# Reference

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1. Github
2. Denisnotes.com
3. IEEE papers on Image Processing Based Intelligent Traffic Control.

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**THANK  
YOU**