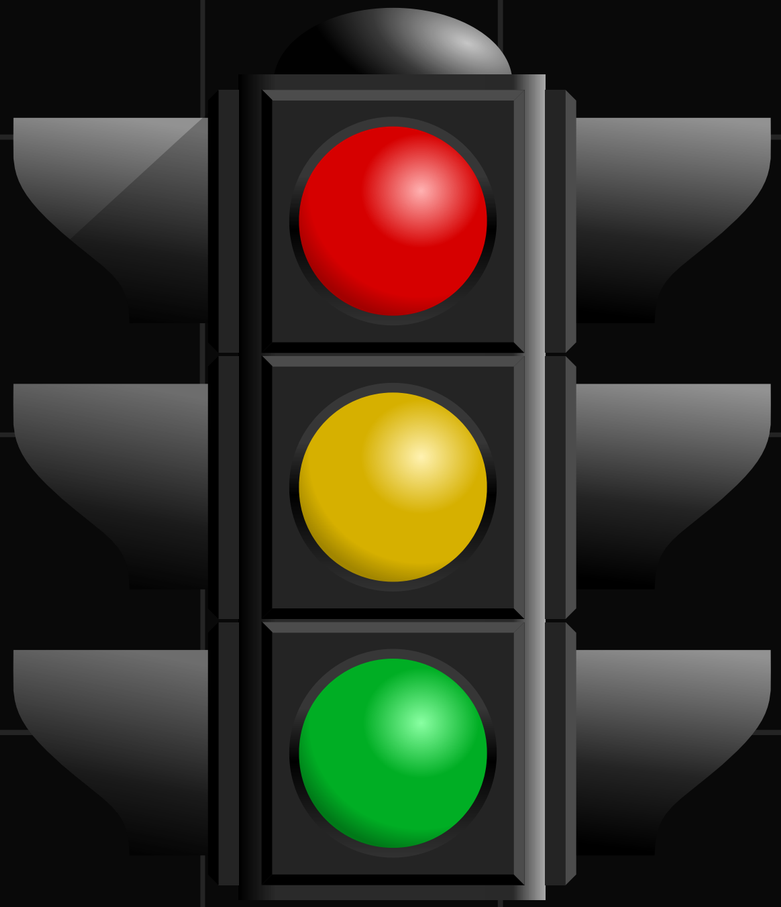
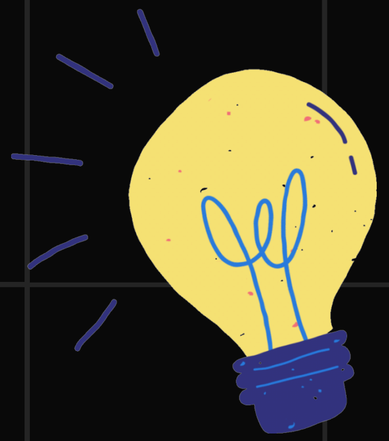
Clevered

Traffic Light Optimization



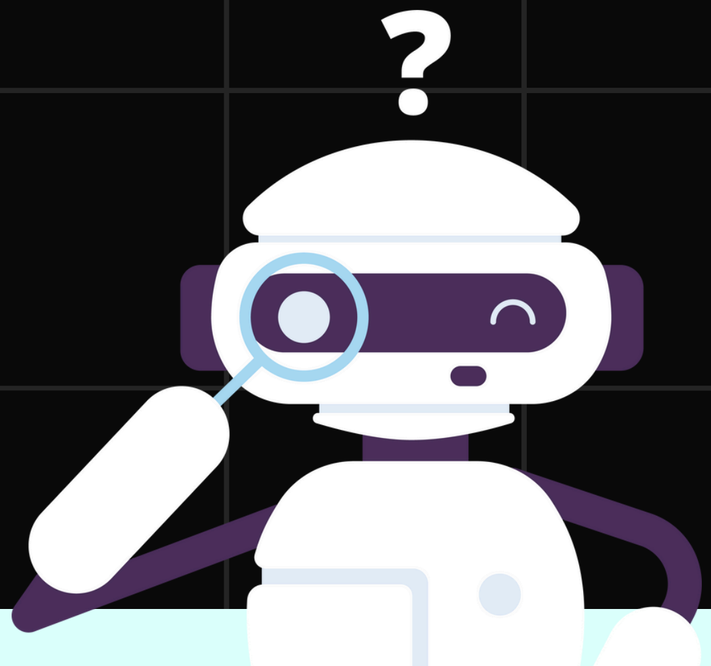
Presented by Venkat Pranav

Aim



To optimize traffic flow using AI

Method



Create Simulation

Create a virtual simulation of a road network with a traffic flow

Train an AI model

Train an Ai model to control the traffic lights with the objective of decreasing the simulation runtime

Packages

SUMO

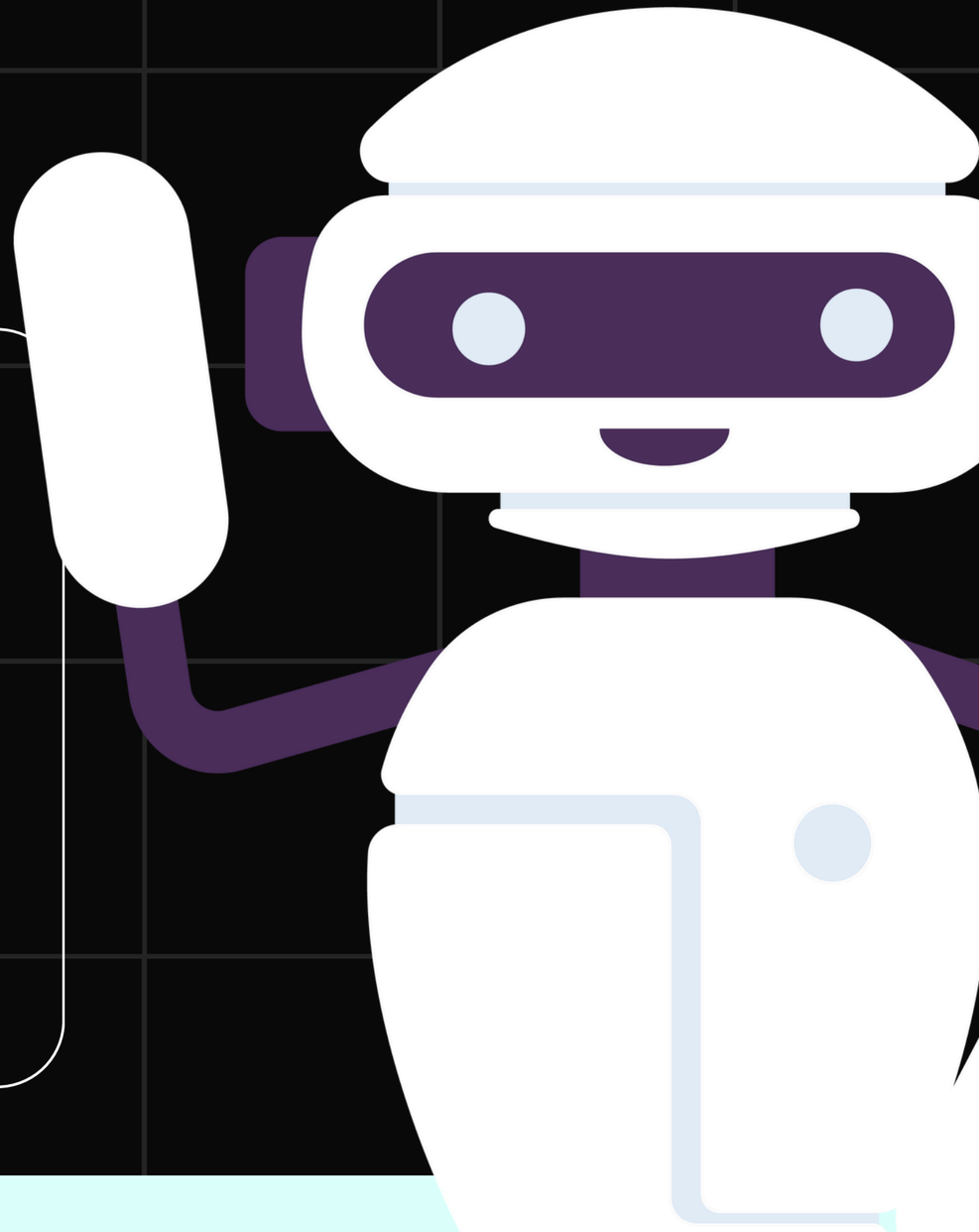
Simulation of Urban Mobility (SUMO) is a multi-modal traffic simulation package designed to handle large networks.

TraCI

TraCI (Traffic Control Interface) provides access to a SUMO traffic simulation.

Pytorch

PyTorch is an open-source deep learning library known for its flexibility, ease of use, and GPU acceleration.



Benefits

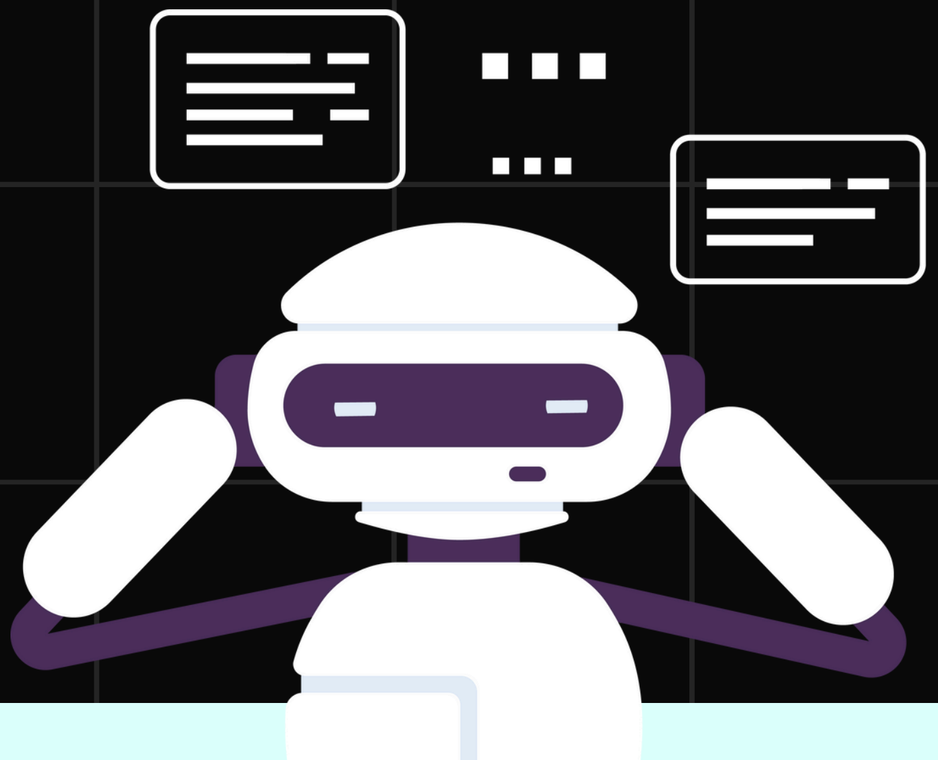
Reduced Traffic Congestion

Improved Fuel Efficiency

Enhanced Road Safety

Scalability

Saved Man-hours



Usage

1. Clone the Repository

First, download or clone the repository to your local machine.

2. Install Requirements

Install the necessary dependencies by running:
 pip install -r requirements.txt

3. Download SUMO GUI

You will need SUMO GUI to run simulations. Download it from here.

4. TRAIN THE MODEL

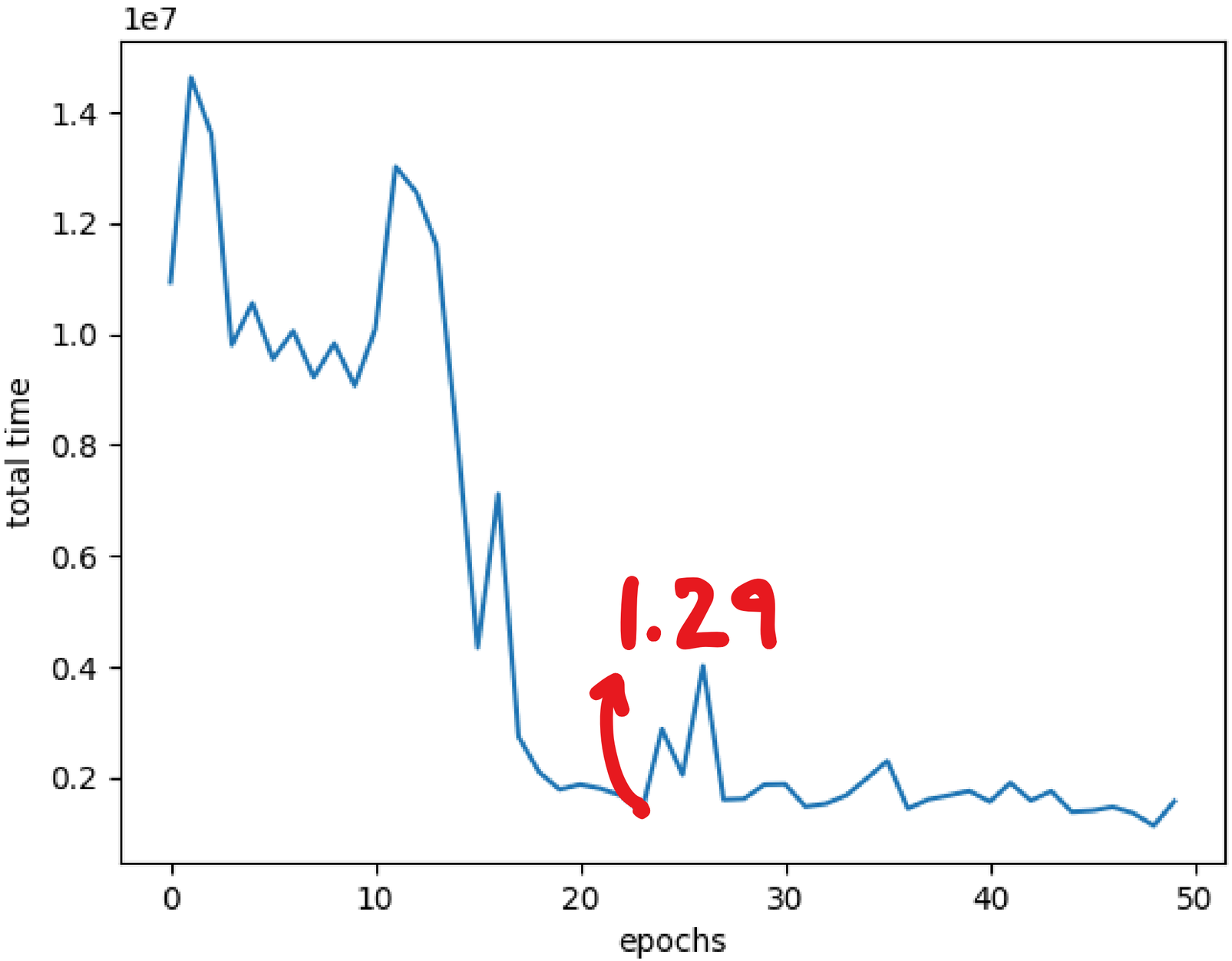
To train a model, use the train.py file with the following command:
python train.py --train -e 50 -m model_name -s 500

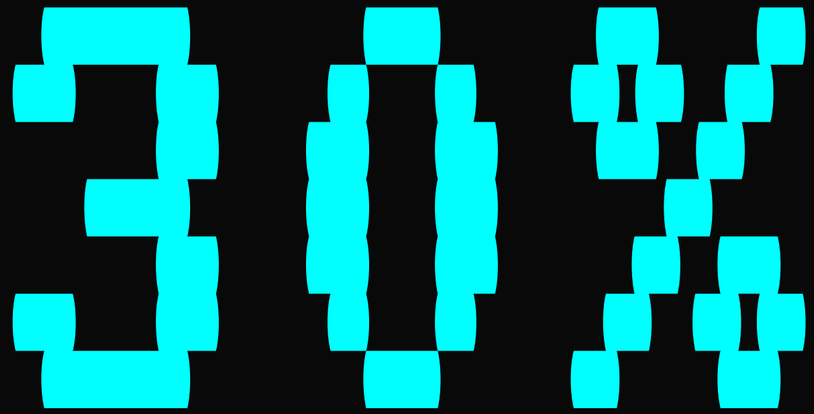
- -e: Number of epochs (e.g., 50)
- -m: Model name to save or load (e.g., model_name)
- -s: Simulation steps (e.g., 500)

At the end of the simulation, it will display a time vs. epoch graph.

5. RUN THE TRAINED MODEL

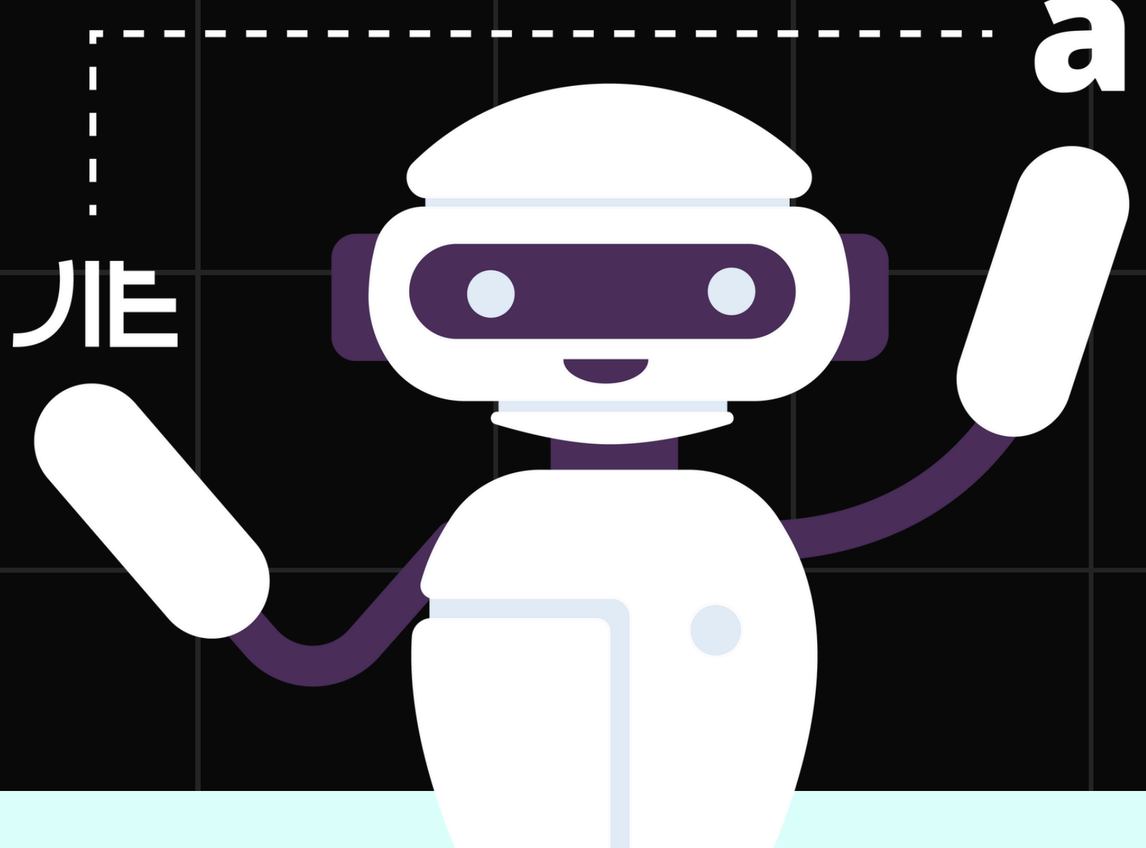
To run the trained model, use the following command:
python train.py -m model_name -s 500


1e7
1.4
1.2
1.0
0.8
0.6
0.4
0.2
total time
0
10
20
30
40
50
epochs
1.29


30%

Future Plans

Train the model on a more complicated dataset like the road network of Abu Dhabi.



Thankyou

Pranav