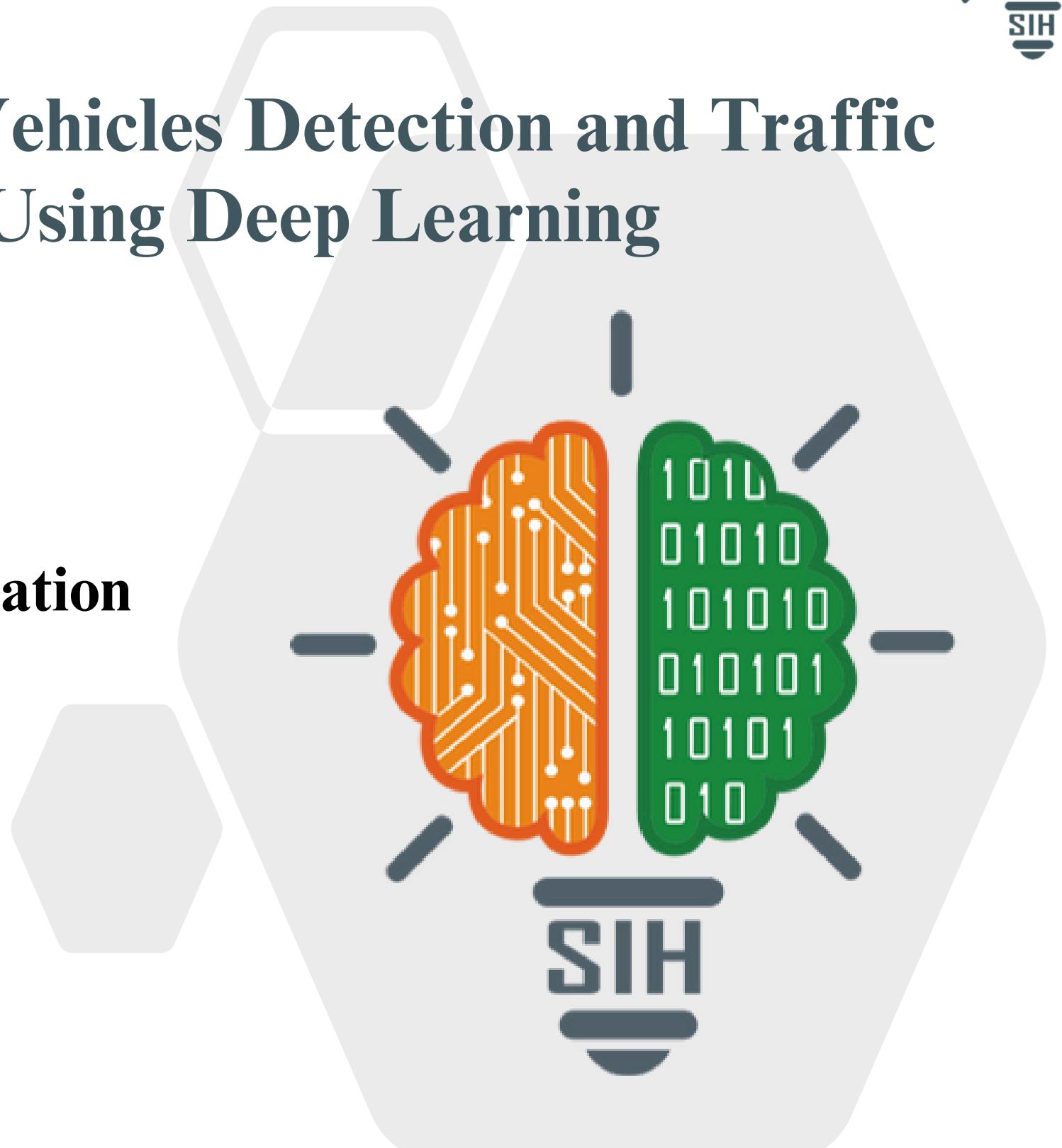


Multiple Emergency Vehicles Detection and Traffic Management Using Deep Learning

- Problem Statement ID - SIH1594
- Problem Statement Title - Student Innovation
- Theme - Transportation & Logistics
- PS Category - Software
- Team ID - 31784
- Team Name - TrafficCrew



Multiple Emergency Vehicles Detection and Traffic Management Using Deep Learning

Proposed Solution/Idea :

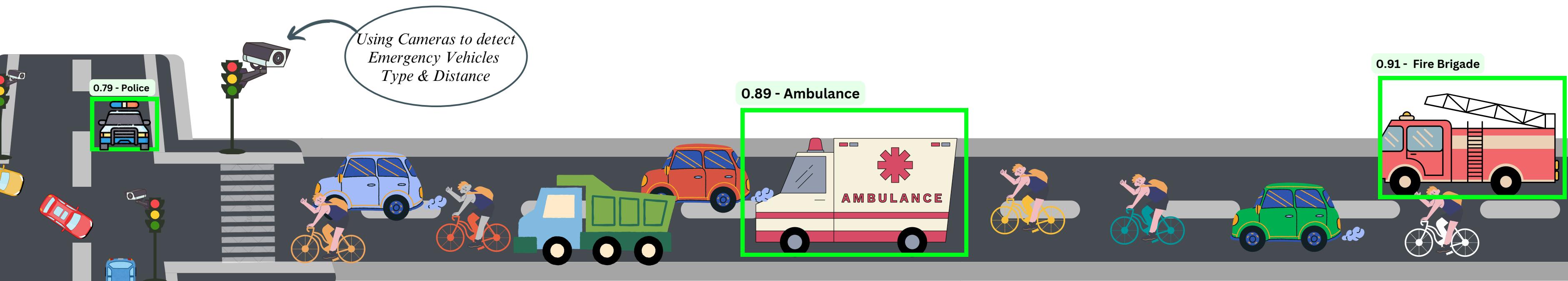
- Our solution uses cameras mounted on traffic lights to detect emergency vehicles and collect real-time data on their type, distance, and surrounding traffic conditions.
- A prioritization algorithm then processes this data to minimize waiting time for the emergency vehicles by adjusting the traffic lights, while ensuring minimal disruption to other traffic flow.

How It Addresses the Problem :

- Faster Emergency Response
- Enhanced Safety
- Balanced Traffic Flow

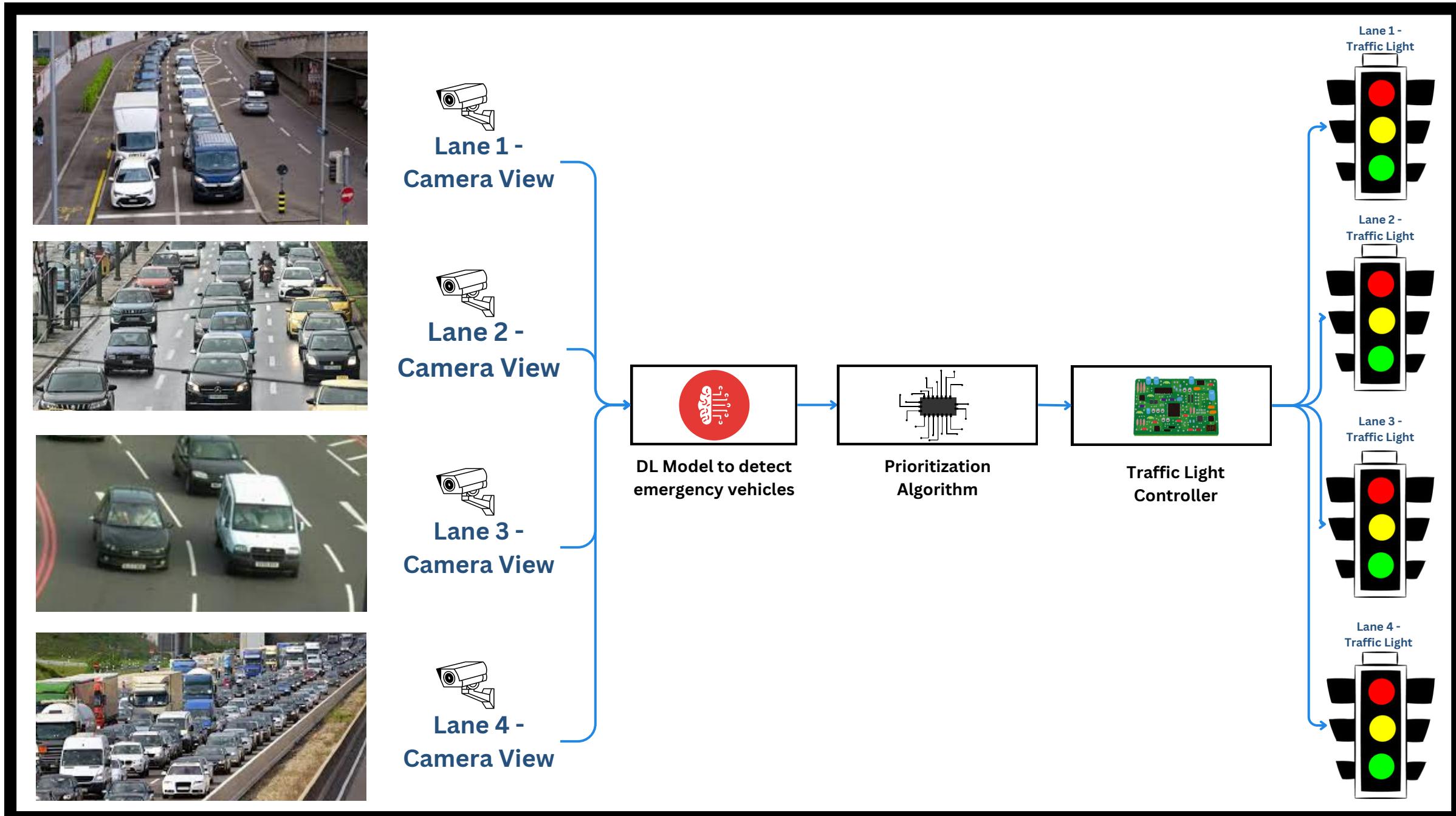
Innovation & Uniqueness :

- Advanced Prioritization Algorithm - *Handling multiple emergency vehicles at a time in intersection*
- All in One Model - *One model for detection, distance calculation & traffic conditions*

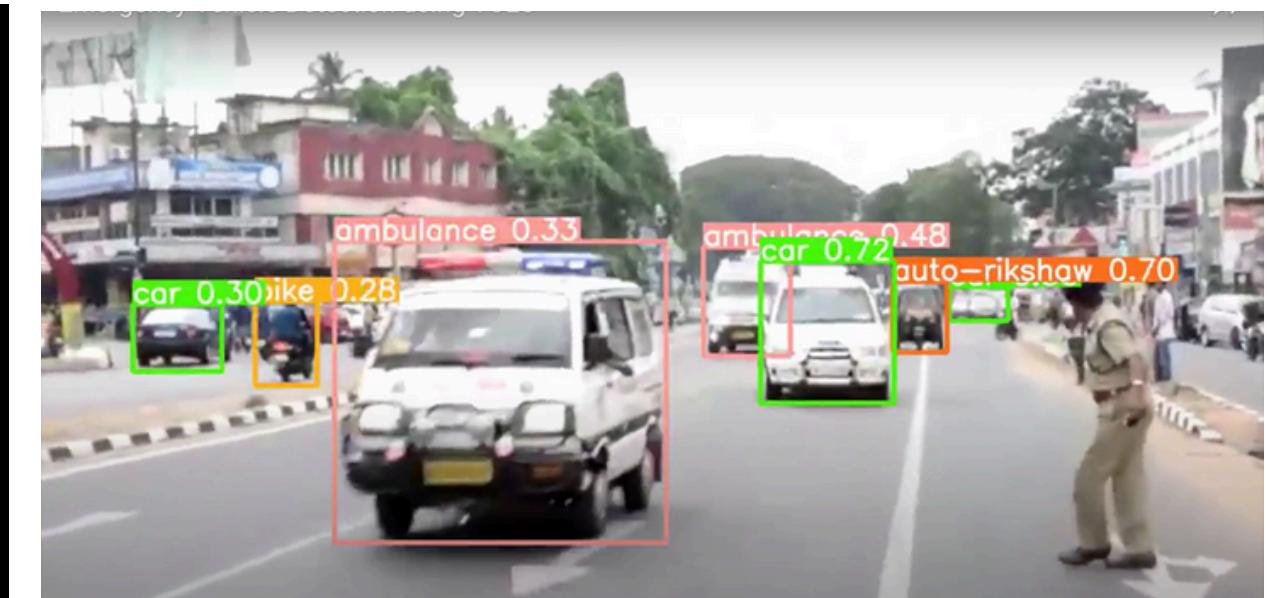


TECHNICAL APPROACH

Systems Architecture :



Model Prediction On Video :



Result Img1 : Detected Emergency vehicles - 2 Ambulances



Result Img2 : Detected Emergency vehicles - 1 Ambulance

Technology Stack :

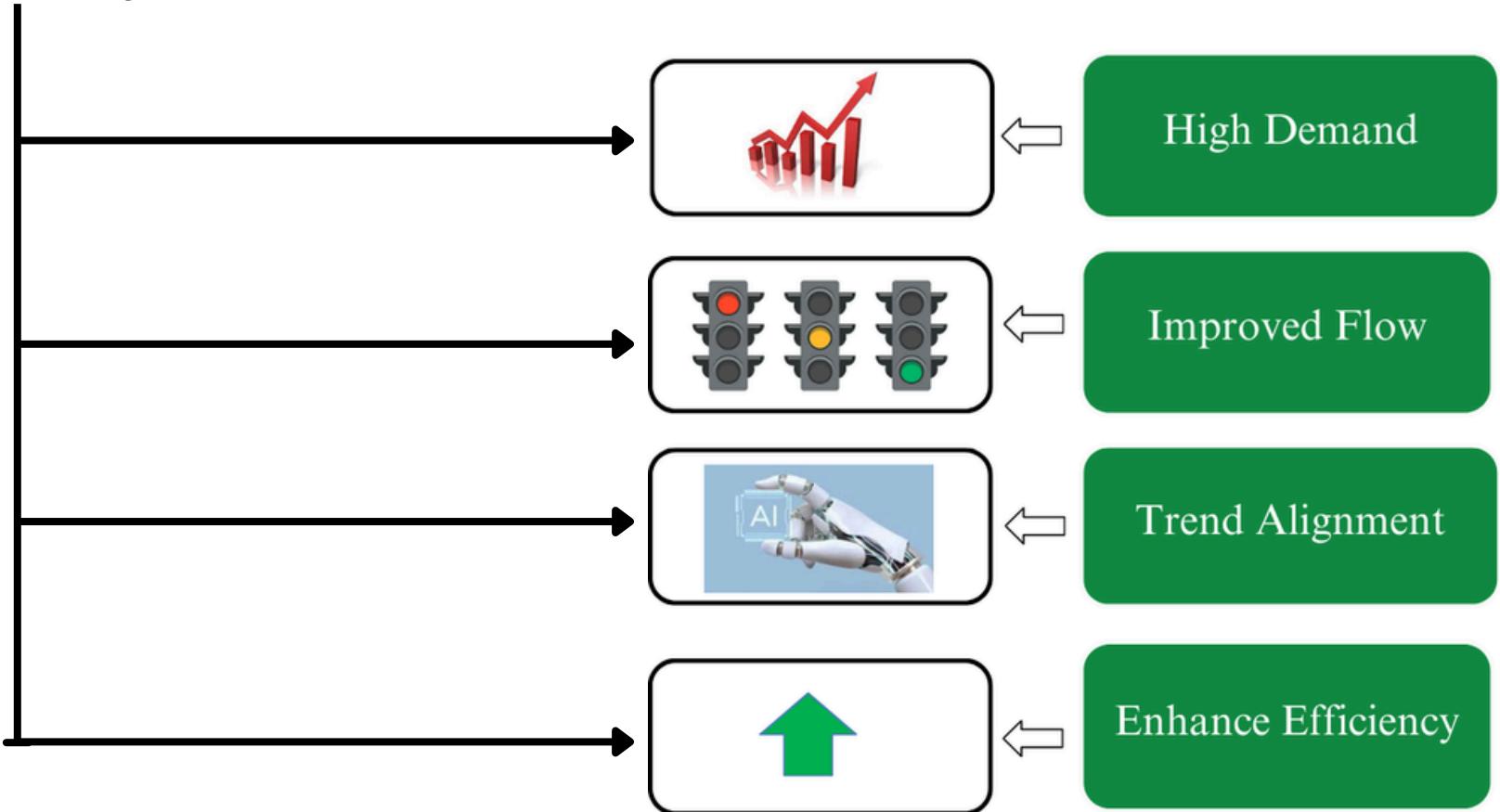
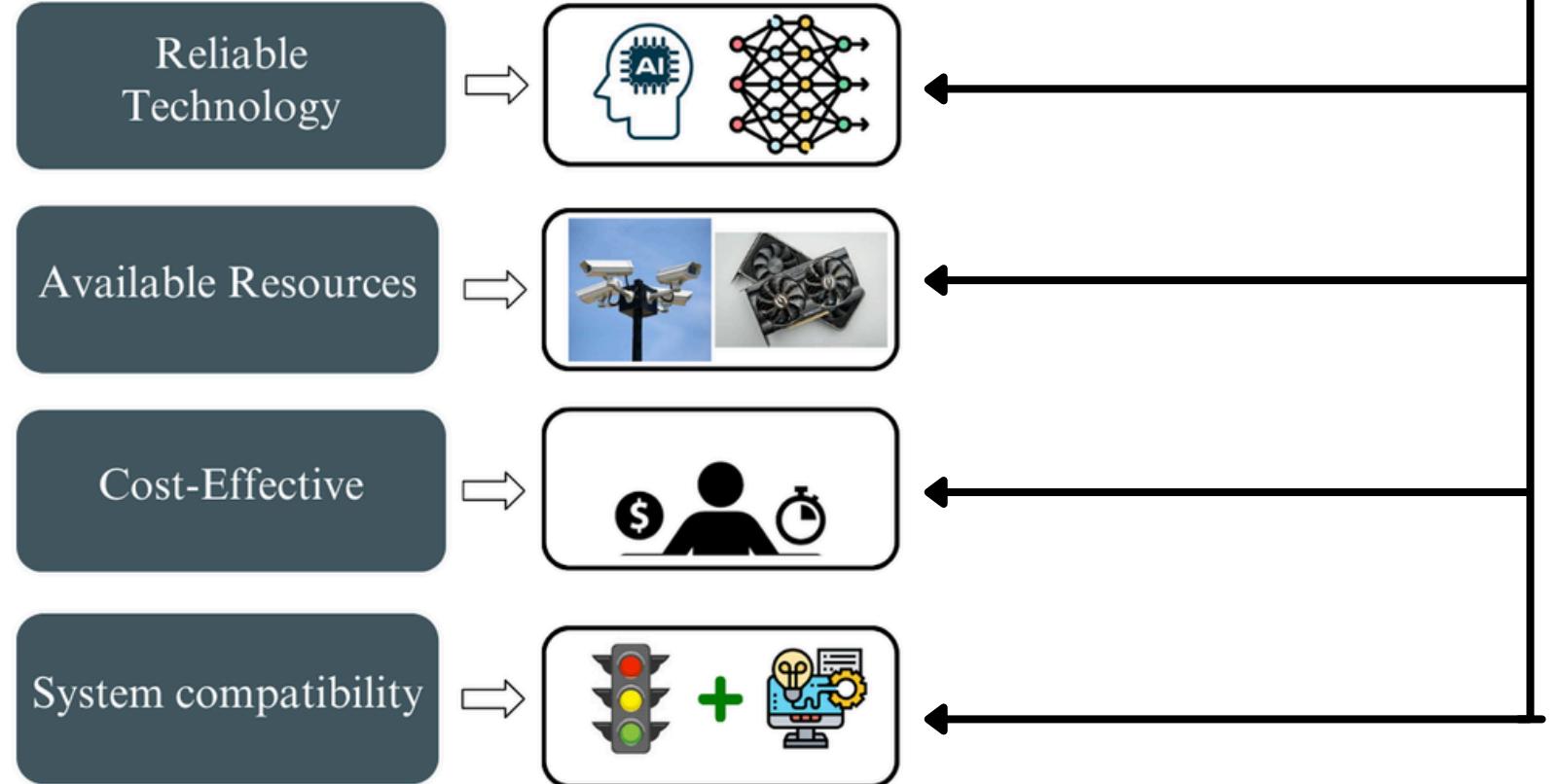


Hardware Requirement :



FEASIBILITY AND VIABILITY

Analysis of Feasibility & Viability of our idea



Potential Challenges and Strategies to Overcome



Public Frustration

Minimize signal changes and consider citizen flow; raise awareness.



System Reliability

Use real-time data to improve accuracy and ensure backup systems work.



Driver Compliance

Educate drivers on responding correctly to emergency signals.



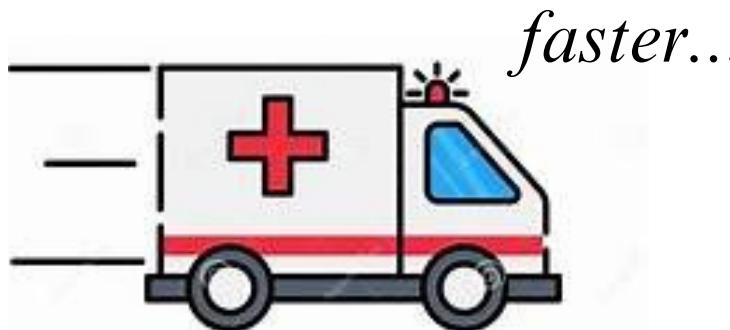
Data Privacy

Safeguard citizen data while training with real-time traffic information.

IMPACT AND BENEFITS

Potential Impact On :

- Emergency Services



- City Infrastructure



- General Public



- Intersection Fatalities



Benefits of the solution

SOCIAL



Increased safety for both emergency workers and everyday drivers



Reduced costs from fewer accidents and quicker emergency responses.

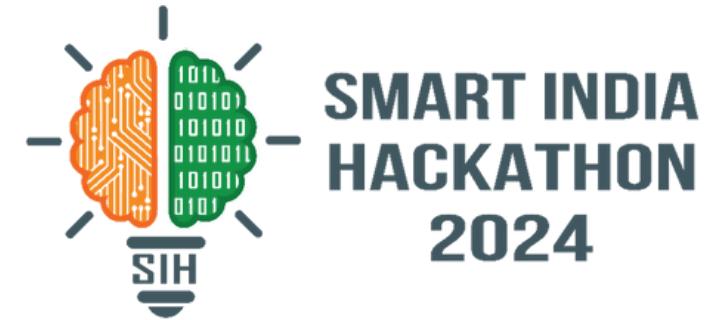
ECONOMIC

ENVIRONMENTAL



Less idling time for vehicles, leading to lower emissions and reduced fuel consumption 6

RESEARCH AND REFERENCES



- [1] Dataset-[<https://app.roboflow.com/ganesh-lbmbj/indian-emergency-vehicles-dataset/2>]
- [2] Working of Traffic Lights-[<https://practical.engineering/blog/2019/5/11/how-do-traffic-signals-work>]
- [3] Model prediction on YouTube video-[<https://www.youtube.com/watch?v=oYIcJ29A7os>]
- [4] A. S. Kumar, and R. Patel, "Advanced Traffic Clearance System for Emergency Vehicles," *ResearchGate*.