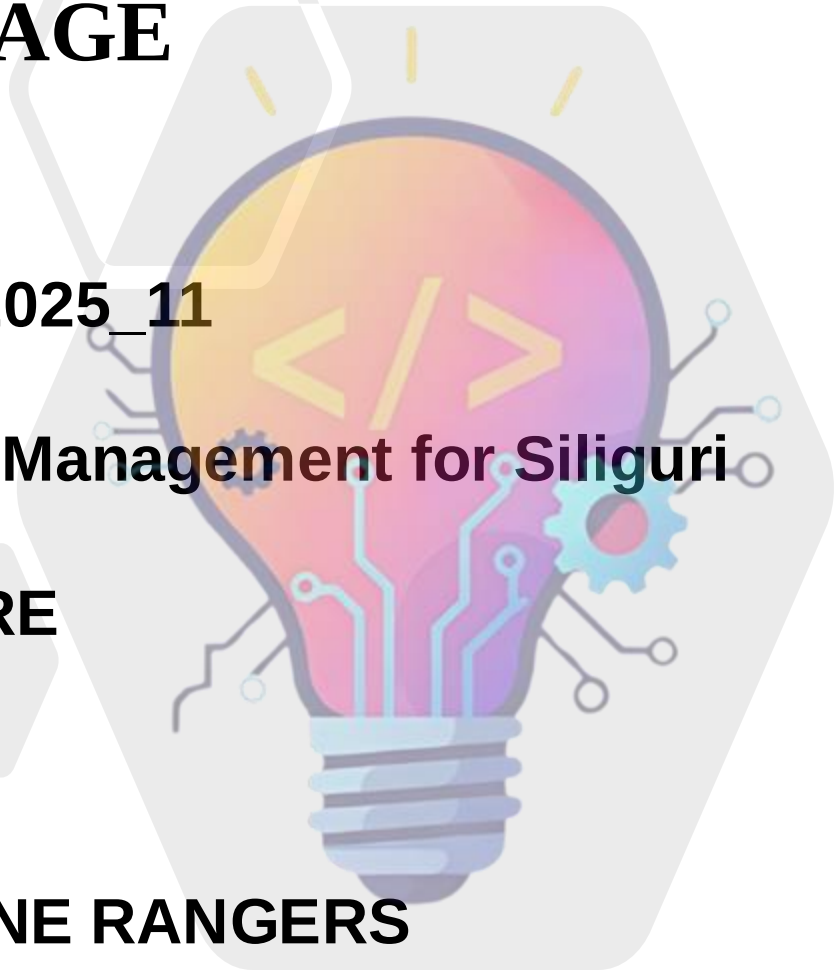
SIT HACK A VERSE 2025

TITLE PAGE



- **Problem Statement ID– SIT_CES_HV_2025_11**
- **Problem Statement Title- Smart Traffic Management for Siliguri**
- **Theme- PUBLIC SAFETY AND WELFARE**
- **Team ID- HV25_T04**
- **Team Name (Registered on portal): LANE RANGERS**

LANE RANGERS

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IDEA TITLE

Proposed Solution (Describe your Idea/Solution/Prototype)

- **Detailed explanation of the proposed solution**
  The AI system analyses the traffic data from the cameras on the road, predicting traffic patterns and adjusting traffic lights in real time.

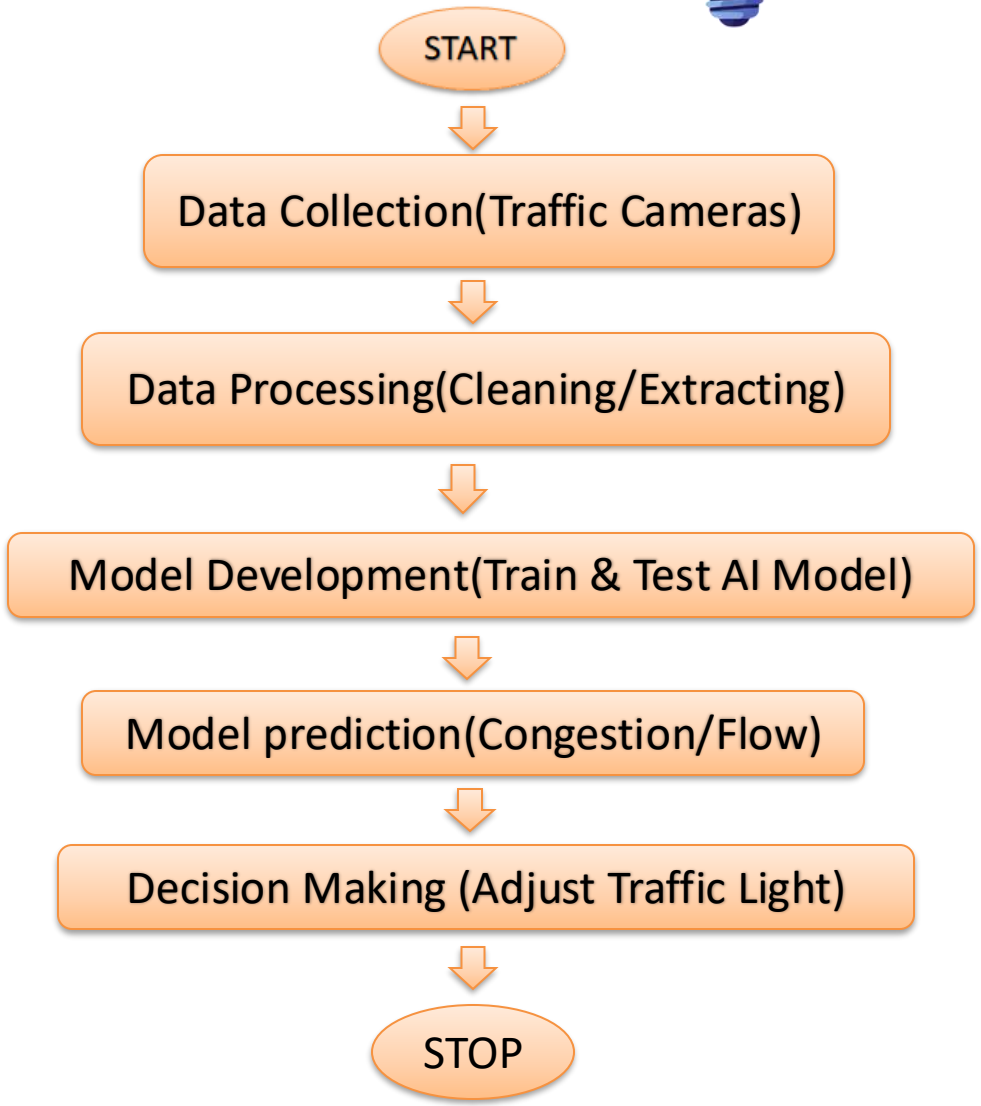
- **How it addresses the problem**
  The solution optimizes the traffic control, reducing congestion, fuel consumption, and emissions for a more sustainable urban environment.

- **Innovation and uniqueness of the solution**
  The solution evolves with time, using AI to respond to real-time traffic conditions for proactive traffic light adjustments, offering smarted approach to urban traffic management.

TECHNICAL APPROACH

Technologies to be used

- **Python:** For the core implementation.
- **Frameworks and Libraries:**
  - **Yolov4:** For object detection.
  - **OpenCV:** For analyzing traffic from camera feeds .
  - **NumPy:** For data processing.
  - **HTML, CSS, JAVASCRIPT:** For designing web page and receiving input images of traffic.
  - **NodeJS:** Creating a server for data transmission.



FEASIBILITY AND VIABILITY

Feasibility Analysis

Technical:

- **Data Collection:** Feasible for modern tech.
- **Processing & ML models:** Possible with current tools.
- **Real-time:** Management with efficient ideas.

Economical:

- **Initial Cost:** Camera, Development.
- **Ongoing Costs:** Maintenance and upgrades.

Challenges and Risks

1. **Data accuracy:** Poor data affects prediction.
2. **Reliability:** System failure disrupts traffic.
3. **Cost:** Potential for budget overruns.

Strategies

1. **Data Accuracy:** Validate and use multiple sources.
2. **Reliability:** Invest in quality software.
3. **Cost:** Budget carefully and seeking funding.

IMPACT AND BENEFITS

Potential impact

1. Commuters:
   - Less Congestion
   - Increased safety.

2. Traffic Authorities:
   - Better control.
   - Improved decision.

Benefits

1. Social:
   - Reduced stress.
   - Increased safety.

2. Economic:
   - Cost Savings.
   - Higher productivity.

3. Environmental:
   - Lower Emissions.
   - Energy Efficiency.

REFERENCES

Python:

- https://youtu.be/NCgjcHLFNDg?si=FMq3tloTjbsOdjOI
- https://youtu.be/UrsmFxEIp5k?si=5gTJsEIROMtU4iT4

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NodeJS:

- http://nodejs.org/docs/latest/api/
- https://www.w3schools.com/nodejs/nodejs_filesystem.asp#:~:text=Node.js%20as%20a%20File,%3D%20require('fs')%3B

Object Detection:

- https://www.geeksforgeeks.org/detect-an-object-with-opencv-python/`
- https://www.youtube.com/watch?v=yqkISICHH-U