TANGONET SOLUTIONS

CASE STUDY

Automated Traffic Monitoring and Infraction Detection: Development of an Innovative Video Capture Solution using AI

1. The Challenge: Automating Traffic Infraction/Behavior Detection and Management

Introduction of the Client:

With the increasing challenges of managing traffic in urban centers and ensuring road safety, a governmental transportation agency sought ways to automate traffic rules violation detection and reporting.

The Problem Statement:

Manual methods of traffic monitoring, violation detection, and ticketing were resource-intensive and prone to inaccuracies. The agency wanted an automated, accurate, and scalable solution.

Client's Objective:

Design and implement a system that can continuously monitor traffic, detect violations in real-time, and automatically process and report the infractions.

2. The Solution: Leveraging Video Feeds and Backend Data Processing

Initial Interaction:

Tangonet engaged with the client to understand the requirements in-depth. Recognizing the potential of automation, they proposed a system utilizing IP camera feeds and advanced video analytics.

Our Proposed Solution:

Tangonet developed a unique video capture system that utilizes feeds from standard IP cameras to monitor traffic. This system was designed to capture details including license plates, vehicle velocity, and stop line/sign violations as well as pedestrian movement on or near the roadways.

Infraction management was built as a post-process. Once a violation was detected, the system would automatically match the license plate with the relevant owner database entry and proceed to process and send the infraction report.
For real-time system monitoring, a backend data processing platform based on InfluxDB and Grafana was implemented.

Implementation Details:

Lightweight video analytics and AI algorithms were designed to efficiently and accurately capture infractions and license plate details, even at high speeds, using Raspberry Pi hardware for edge computing, Python and AI software (Tensorflow-Lite) for vehicle and pedestrian detection in real time.

Integration was done with the existing database to capture vehicle owner details and automate the entire infraction reporting process, based on the license plate capture.

A Grafana-based dashboard was set up to give the user an overview of the system's status in real time, helping in decision-making and resource monitoring and allocation.

3. The Results: Enhanced Traffic Monitoring and Automated Violation Management

Immediate Outcomes:

The system's automation drastically reduced the manpower needed for traffic monitoring and violation reporting. Accuracy and promptness of infraction reports also saw a significant improvement.

Long-Term Benefits:

Road safety was enhanced as the system acted as a deterrent for potential violators, reducing the possible consequences to lives and livelihoods resulting from violation of traffic laws. Furthermore, the transport agency could reallocate resources to other

critical public safety areas, thanks to the efficiency gains. The system, thanks to the use of open-source tools, can be modified easily and integrated into other smart infrastructure technology platforms.

Client's Feedback:

"With Tangonet Solutions' innovative approach, we've seen a transformative change in the way we manage traffic violations. Their technology has not only made our roads safer but has also streamlined our internal processes." – Director, Transport Agency

TANGONET SOLUTIONS

LET US HELP YOU FIND YOUR TEAM.

Locations
Atlanta, GA
Buenos Aires, Argentina

Contact
+1 770-864-1200
info@tangonetsolutions.com

Visit Us