VIGILANCE VISION

PROBLEM STATEMENT

KVH-009

ADVANCED CCTV ANALYTICS SOLUTION

Design and develop a technological solution based on live CCTV feeds, that can automatically detect incidents related to street crime, violence, burglary, theft, infiltration, unauthorized access etc. and generate alerts to the nearest Police Station. The solution should also be able to generate a report and maintain a database that includes the nature of incident/crime, location, time, level of alert (i.e., low, medium, high risk alert) etc.

SOLUTION

Our solution is a deep learning-based approach to developing a web application that provides a comprehensive solution by detecting crimes, misdeeds, and other unlawful activities from a live CCTV stream and providing a mechanism for generating alerts to law enforcement. Our solution benefits two main user demographics:

1. Law enforcement authorities and other government entities
2. Private citizens/users

USER DEMOGRAPHICS

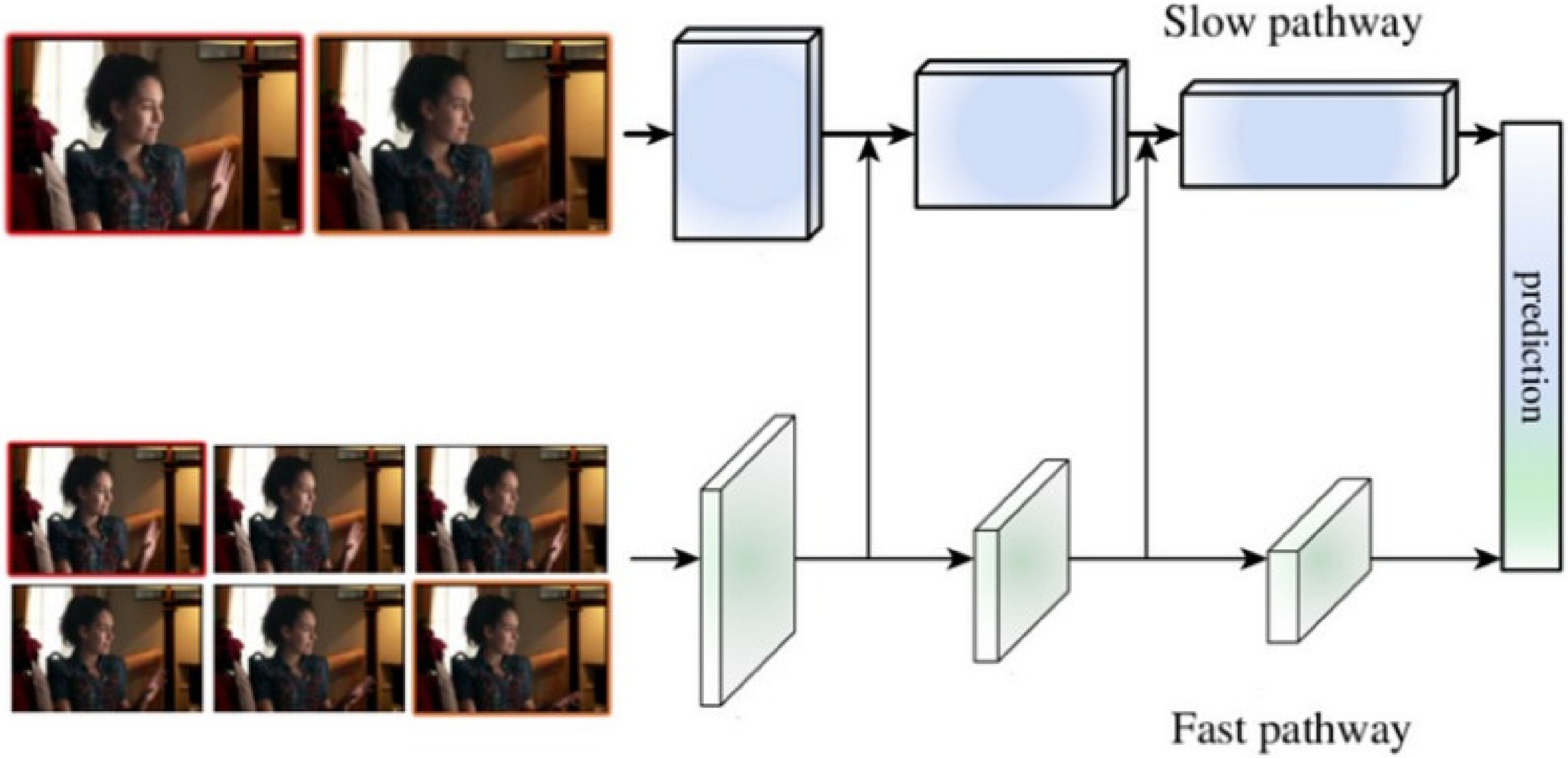
LAW ENFORCEMENT

Our solution provides exclusive analytics while expediting their response time to a crime location. It is specifically targeted towards CCTVs and their streams that are under governmental supervision.

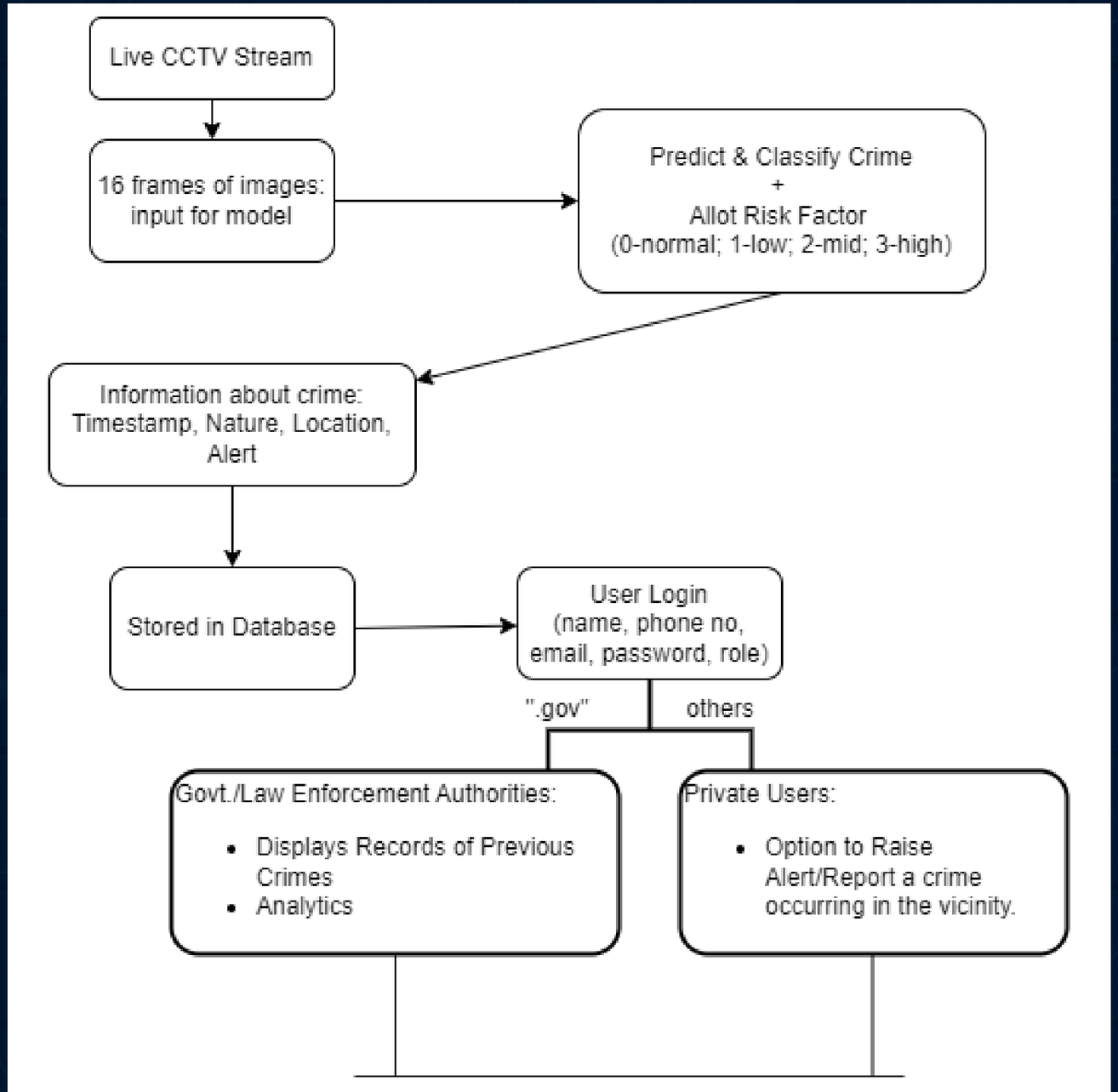
PRIVATE CITIZENS

Our solution enhances security by enabling users to report crimes at a faster rate and increase security at their homes. These users will not have access to the comprehensive analytics that law enforcement does.

MODEL ARCHITECHTURE



DATA FLOW


Live CCTV Stream
16 frames of images: input for model
Predict & Classify Crime
+
Allot Risk Factor
(0-normal; 1-low; 2-mid; 3-high)
Information about crime: Timestamp, Nature, Location, Alert
Stored in Database
User Login
(name, phone no, email, password, role)
".gov"
others
Govt./Law Enforcement Authorities:
Displays Records of Previous Crimes
Analytics
Private Users:
Option to Raise Alert/Report a crime occurring in the vicinity.

SALIENT FEATURES

01 Real-time Surveillance

- Increases efficiency of CCTVs.
- Not possible to tamper footage and reduction in oversights.

02 Improved Response Time

Immediate reports raised according to alert levels allows authority to act accordingly.

03 Data Analytics

Helps Law Enforcement Agents in Operations Research to allocate resources as per demand.

SALIENT FEATURES

CCTVs in the current paradigm is checked only after a crime has occurred, which can lead to the footage being tampered with or becoming redundant due to it being checked after the anomalous activity. Here, we are analyzing the footage in real time and thus improving the efficiency of the CCTVs. It also helps in the reduction of oversights, since real time data is analyzed and any required action can be taken immediately.

SALIENT FEATURES

- Reducing law enforcement response time, allowing for variation in the degree of law enforcement involvement depending on crime severity, better crime tracking, help in crime reduction using the analytics that we provide.
- Security features like having sensitive data available only to law enforcement authorities and not private citizens and hence having a layer of abstraction without compromising on safety.

SALIENT FEATURES

- SMS and E-mail alerts to private citizens in case of any security risks with an option to report it to law enforcement agencies if needed. An alert to law enforcement will be immediately sent incase of a crime with a high alert level.

Our solution also has **Business Potential:** it can be licensed and sold to law enforcement and private users by using this software to improve response time.

BUSINESS POTENTIAL

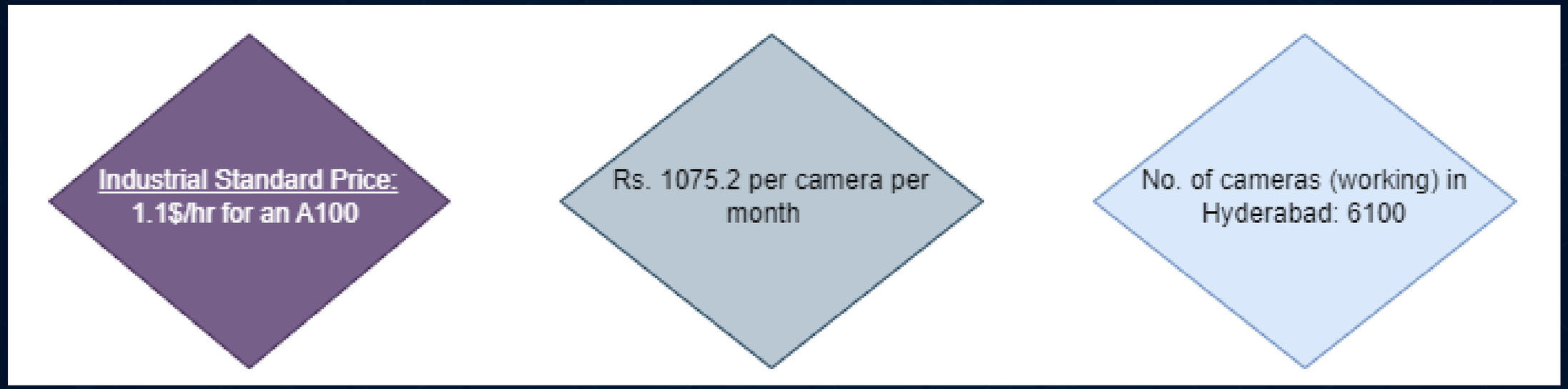
The solution can be licensed and sold to both law enforcement agencies and private users.

The solution can help improve response times for law enforcement and reduce involvement depending on crime severity, track crimes better, and provide valuable analytics.

Vigilance Vision's web-based application has the potential to be a highly sought-after product in the security solutions market. The increasing demand for advanced security solutions, the solution's unique features, and its ability to be licensed and sold to a broad customer base make it an attractive business opportunity.

FEASIBILITY

The NVIDIA A100 GPU is a powerful accelerator designed for high-performance computing and artificial intelligence workloads.

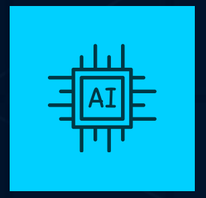


The above stats were obtained on research and the following conclusions were made:

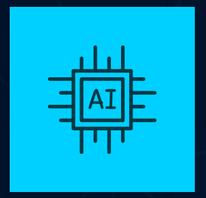
65.64 lakhs per month is enough to power analytics and surveillance for the entire city of Hyderabad.

86 million requests can be served on an A100 GPU per day. Economics of Scale helps in making this feasible.

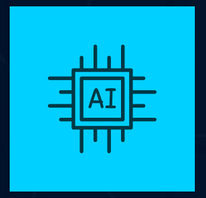
FUTURE SCOPE



Mobile Application for users, to effectively track all their CCTV alerts and security metrics. Users can access their CCTV feeds from anywhere, allowing them to keep an eye on their properties even when they are away.
The app can also send alerts based on your current location and alert you if any crimes occur in your vicinity.



To improve the model accuracy with time using a live streaming data pipeline. Also collaborate with law enforcement to make a very Indian context focussed data set.



CCTVs in the current context might not have the same quality of video being streamed which makes pre-processing a difficult task. In the future we aim to implement algorithms that make this pre-processing task easier.