

KVH-005

ADVANCED ANPR & FRS SOLUTION



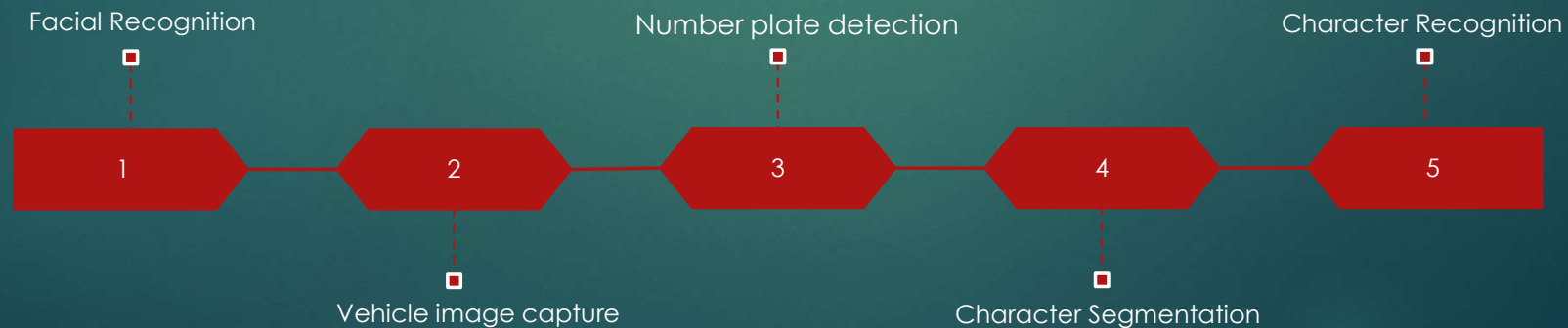
TEAM / PROBLEM STATEMENT:

- ▶ PSID : KVH-005
- ▶ Problem statement : Advanced ANPR & FRS Solution.
- ▶ Team Name : [NAS]^2
- ▶ Team Leader : Abarajith S
- ▶ Team Members : Abarajith S, Nakshatiraa K N, Navin R C, Shree Niranjana M, Arvind M, Shriram V
- ▶ Institute Name : Shiv Nadar University, Chennai.

IDEA

► This ANPR solution and FRS include software that runs on either the camera or a server. It automatically captures license plates in real time. Relying on well trained deep-learning models, the ANPR engine includes following features:

- Multilingual Recognition Recognizes English, Hindi, Tamil, Telugu and other Indian languages.
- AI Based vehicle attributes recognition like vehicle type, colour.
- Fast and High Recognition Rate with alphanumeric number plates
- Works in harsh weather conditions.
- Multiple lane operation
- Detects Over speeding and sends automated warnings
- Vehicular Tracking
- Updates date, time and location of the captured vehicle
- Cost-effective Technology
- Procure data from cameras anywhere



PROCESS:

1)Pre-processing:

(1)Convert color image to grayscale

(2) Remove the noises in it

2) Plate Localization:

(1) Edge Detection

(2) Number Plate Isolation

(3) Number Plate Orientation and Sizing: resize the isolated number plate by removing the border around the plate.

3) Character Segmentation

4) Character Recognition

DEPENDENCIES:

- ❑ **Operating System:** ANPR software requires a specific operating system (OS) such as Windows, Linux or MacOS, which needs to be installed on the computer or server that will run the software.
- ❑ **Programming Language:** Python IDE like Spyder or Jupyter Notebook.
- ❑ **Data Processing Libraries:** Keras, Tensorflow.
- ❑ **Image Processing Libraries:** OpenCV, EasyOCR, imutils, dlib and face_recognition.
- ❑ **Camera Interface:** ANPR software needs to interface with cameras to capture images of the number plates.
- ❑ **Database Management System(storage):** ANPR software needs a database to store the number plate images and associated metadata like MySQL and MongoDB or even cloud storage for datasets.
- ❑ **Network Interfaces:** ANPR software may require network interfaces to communicate with other systems or devices, for example, sending notifications to a security system or communicating with a cloud-based service.

USE CASE

► Road Safety Enforcement :

Automatically recognizes speeding and red-light violations and notifies the driver and to the nearby police authority.

► Law Enforcement :

Verifies vehicle license and registration. Provides an automatic alert when blacklisted vehicles passes by. Detects duplicate licence plates. Provides lines of enquiry and evidence in the investigation of crime.

► Smart City Management :

With the increasing demands on our city infrastructure, Intelligent ANPR is seen as a way to manage transport resources more effectively. ANPR technology is becoming increasingly important and can provide significantly more information than simple traffic counters.

SHOW STOPPER



Plate Management & Search

- Black/White List Management
- List Scheduling Management
- LPR Smart Search



Integrated 3D Radar

- Excellent Radar Capabilities
- 3D Radar Localization
- Stable Detection in All Weather Conditions



Precise Capture

- Day/Night Superior Image Quality
- Speedy and Accurate Capture



AI-empowered LPR

- Embedded AI LPR Algorithm
- AI-based Vehicle Attributes Recognition