MIET
FUTURE BEGINS HERE....

Mini Project - COM-612

Final Evaluation

CHAKRAVYUH

Intrusion Detection in Home Automation Using Computer Vision and Honeypots

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Contents

Problem Description

Cyber-crime now a days is booming at an alarming rate. The naiveness and the lack of awareness among the users has increased the rate of cyber-crime by a large number. The most common attacks to which the users are most susceptible are the phishing and the MITM(Man In The Middle Attacks) that are usually carried out on the free public WIFI's and home gateways. An estimate of about **10.5 Trillion Dollars** is the round figure that cyber frauds are going to cost the world in the coming years.

Problem 1

People don't really care about their online activities and the cyber-crimes until they encounter one.

Problem 2

Intrusion is not only limited to internet world but also is being observed in physical world, i.e., in lodgings.

Problem 3

There are different types of cyber-attacks and physical intrusions but no one stop solution currently available.

Solution

One stop Intrusion Detection System

Solution 1

Development of an advanced intrusion detection networking system, automation, and notification system using the latest Computer Vision and Honeypot technology.

Solution 2

Creating a hardware and software solution that accurately classifies the level of intrusion in a premises or Local Area Network/Wide Area Network.

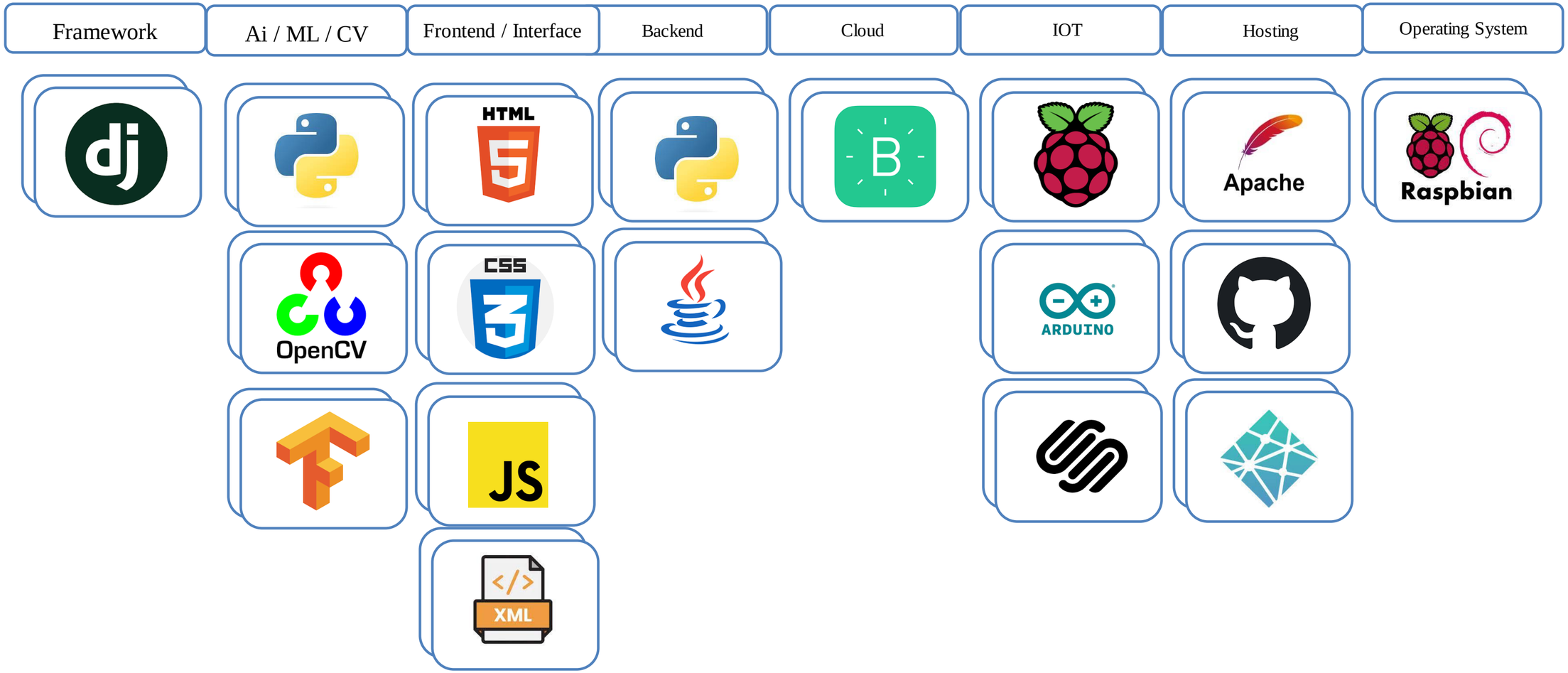
Solution 3

Design and implementing an IoT-based locking system that prevents unauthorized access to the property using Computer Vision and Neural Networks framework.

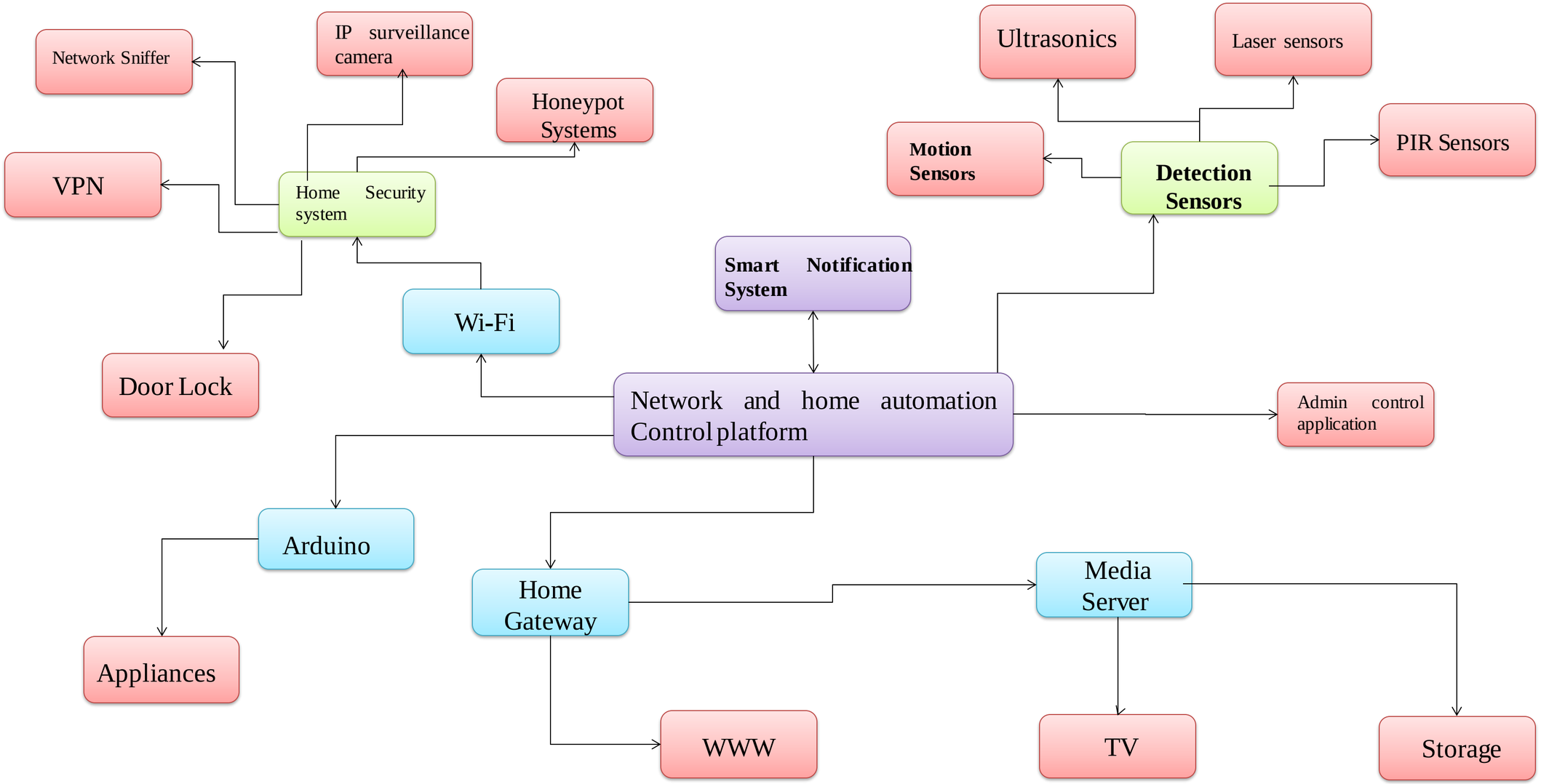
Solution 4

Making the solution available to a common man by using low cost , efficient hardware that provides the same set of functionalities that of a large scale IDS.

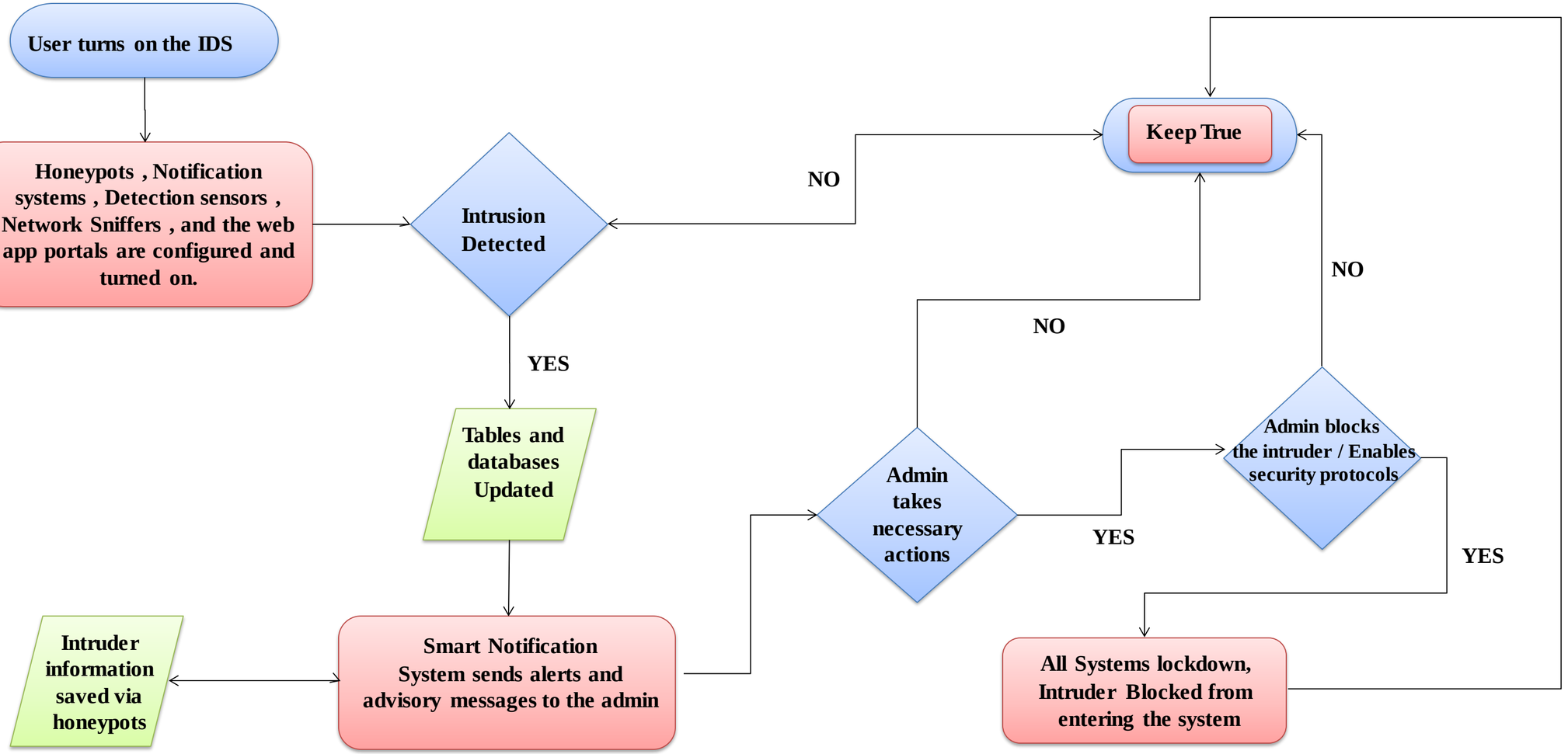
TECH STACK


Framework
Ai / ML / CV
Frontend / Interface
Backend
Cloud
IOT
Hosting
Operating System
dj
OpenCV
HTML
CSS
JS
XML
B
ARDUINO
Apache
Raspbian

FRAMEWORK


Network Sniffer
IP surveillance camera
Honeypot Systems
VPN
Home Security system
Ultrasonics
Laser sensors
Motion Sensors
Detection Sensors
PIR Sensors
Smart Notification System
Wi-Fi
Door Lock
Network and home automation Control platform
Admin control application
Arduino
Home Gateway
Media Server
Appliances
WWW
TV
Storage

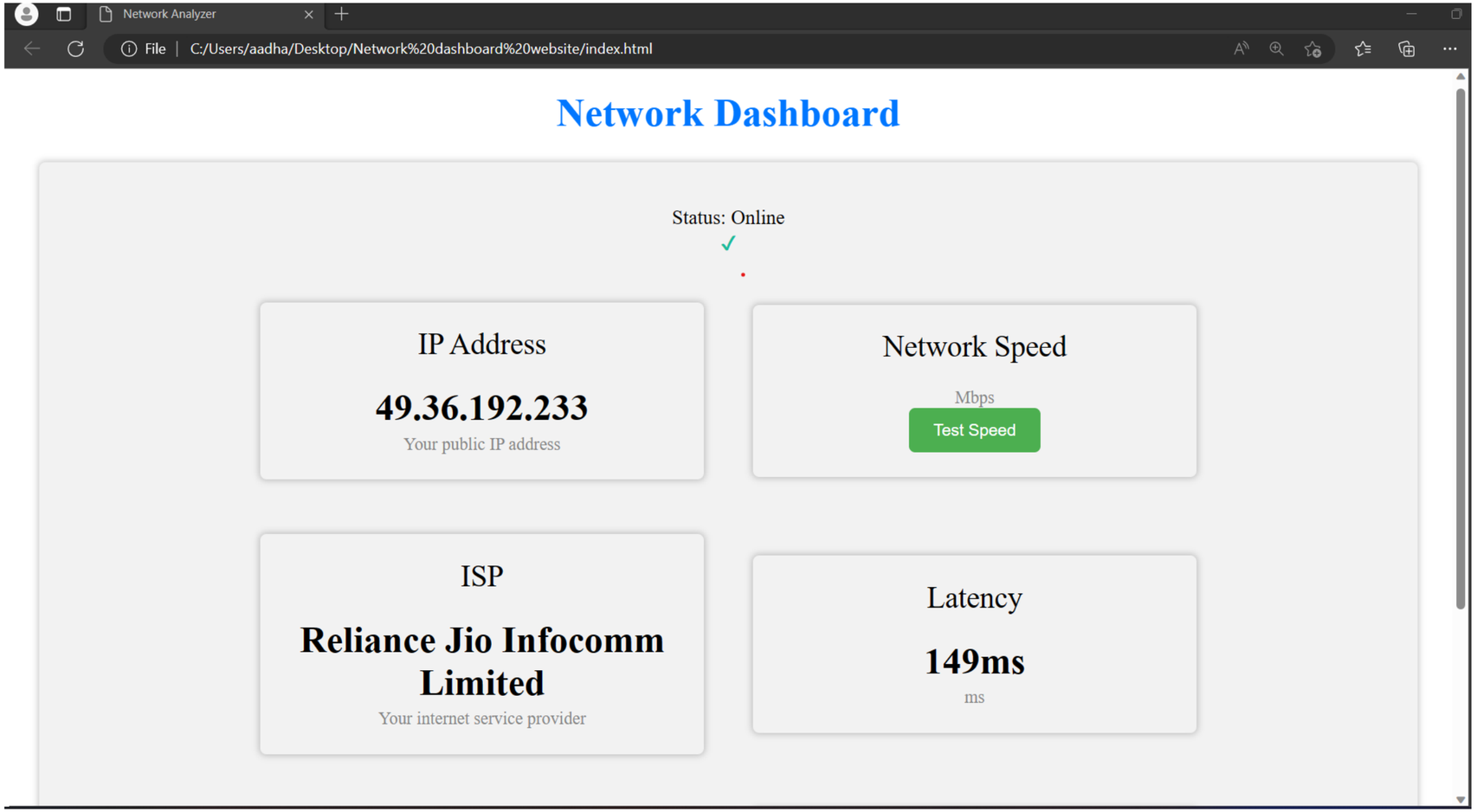
WORKFLOW


User turns on the IDS
Honeypots , Notification systems , Detection sensors , Network Sniffers , and the web app portals are configured and turned on.
Intrusion Detected
NO
Keep True
YES
Tables and databases Updated
Intruder information saved via honeypots
Smart Notification System sends alerts and advisory messages to the admin
Admin takes necessary actions
NO
YES
Admin blocks the intruder / Enables security protocols
NO
YES
All Systems lockdown, Intruder Blocked from entering the system

PRODUCT MODULES

- **Network Gateway Module**
- **Honeypot Module**
- **IOT Modules**
- **Blynk Cloud Module**
- **Computer Vision Module**
- **Surveillance Module**
- **Android App Module**

NETWORK GATEWAY DASHBOARD

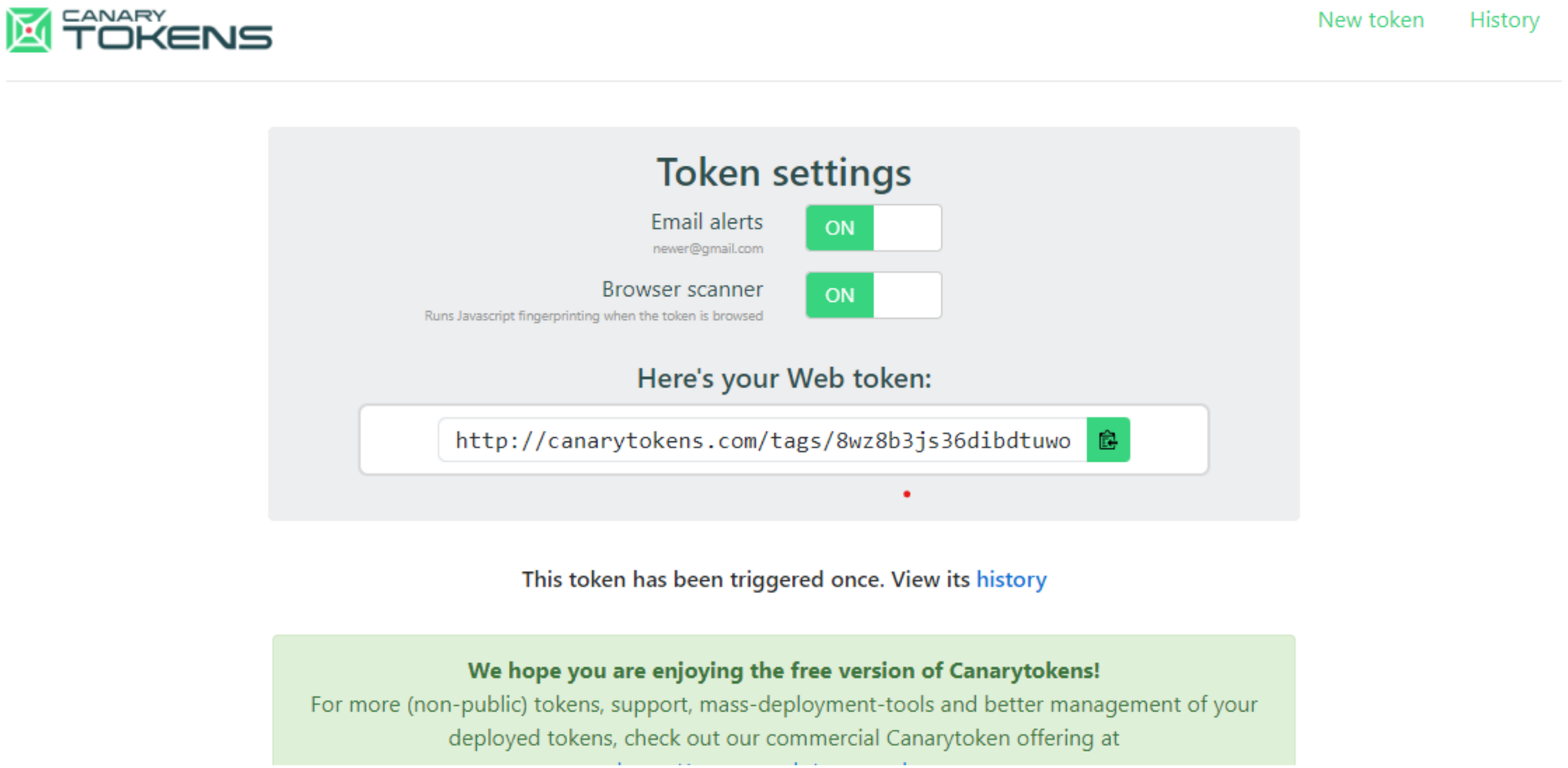


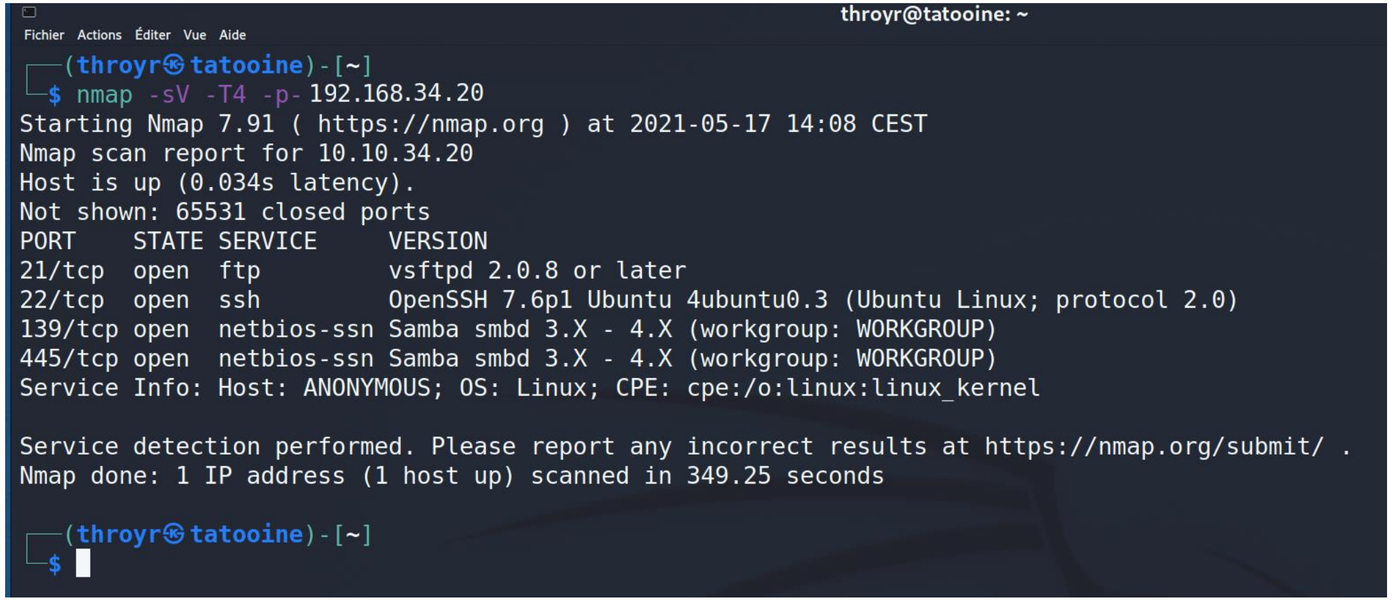
Features

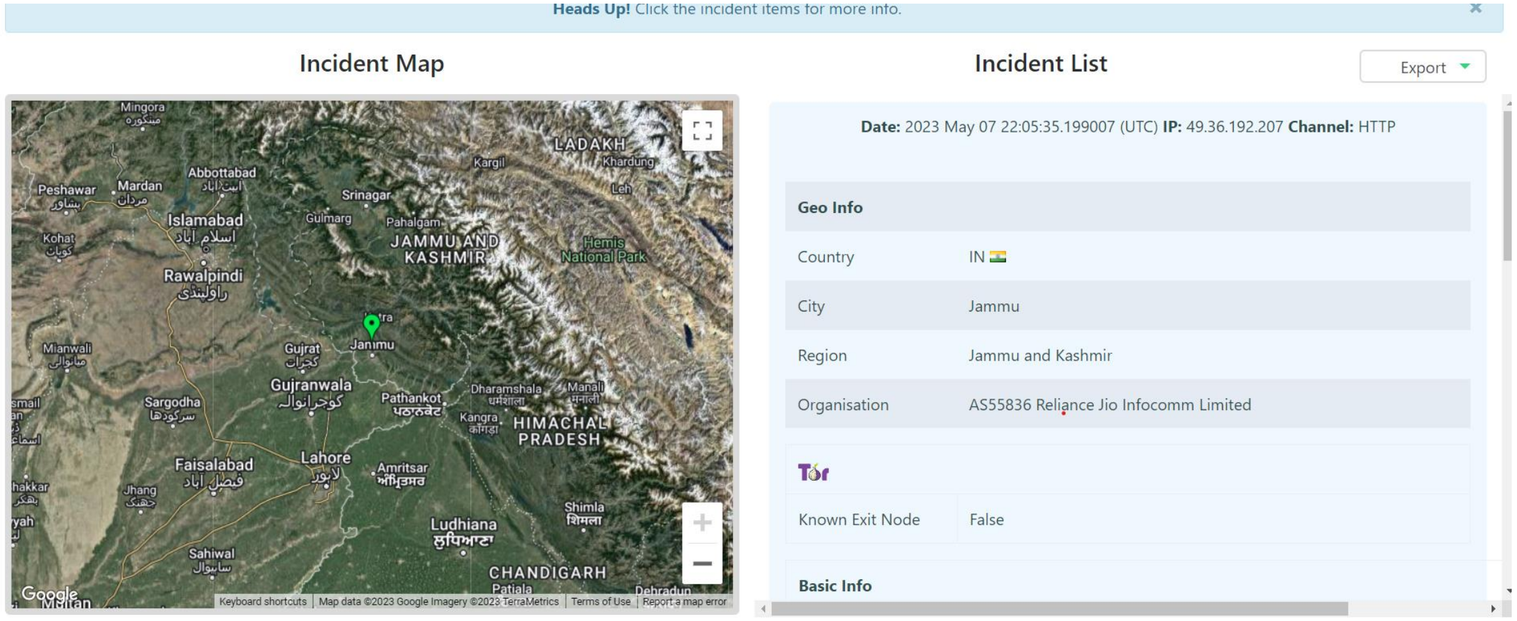
* Login functionality
* Network IP
* Network Speed
* ISP
* Network Latency
* Router’s IP
* DNS IP
* Apache2 Network Load Balancing

Test it Out on your device:

HONEYPOT SYSTEM







Features

* Decoy Vulnerable FTP server
* Flag based Tracking
* Type of attack vector identification
* Attack vector Location
* Attacker IP address
* Realtime network monitoring

Test it Out on your device:

HARDWARE COMPONENTS

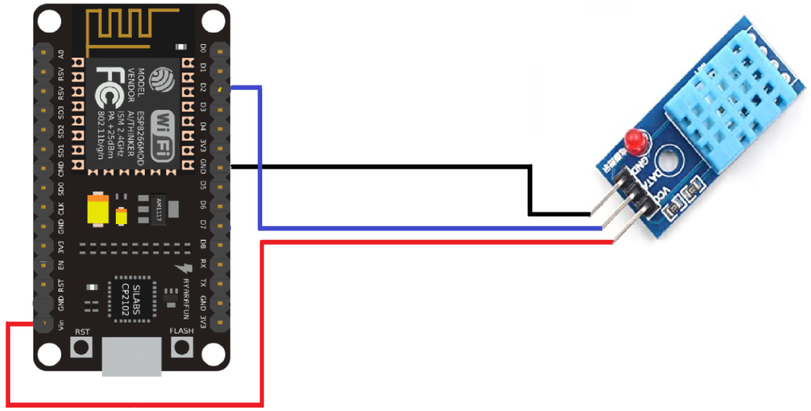
Micro Computers
Raspberry Pi 4 Model B

Wi-Fi Module
ESP 8266

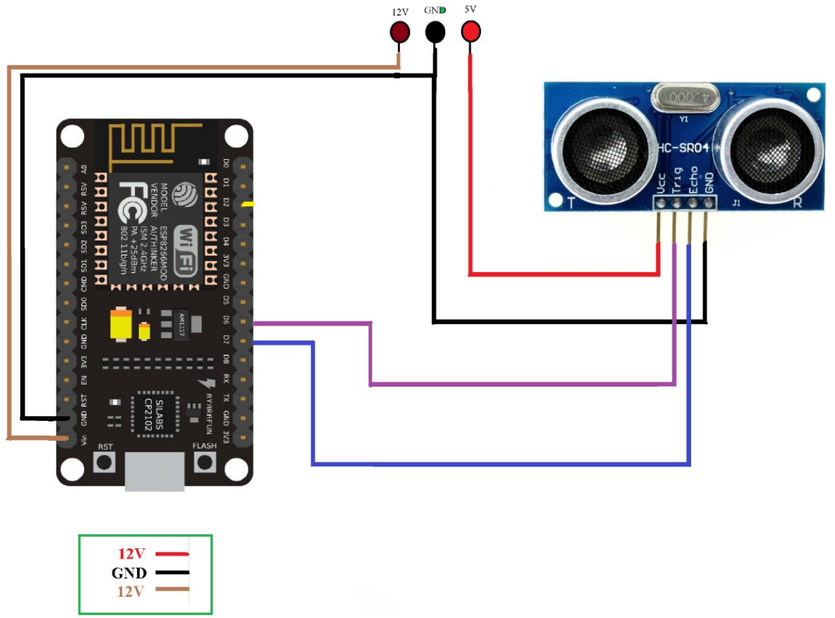
Camera Module
ESP 32 CAM

Sensors

IOT DEVICES

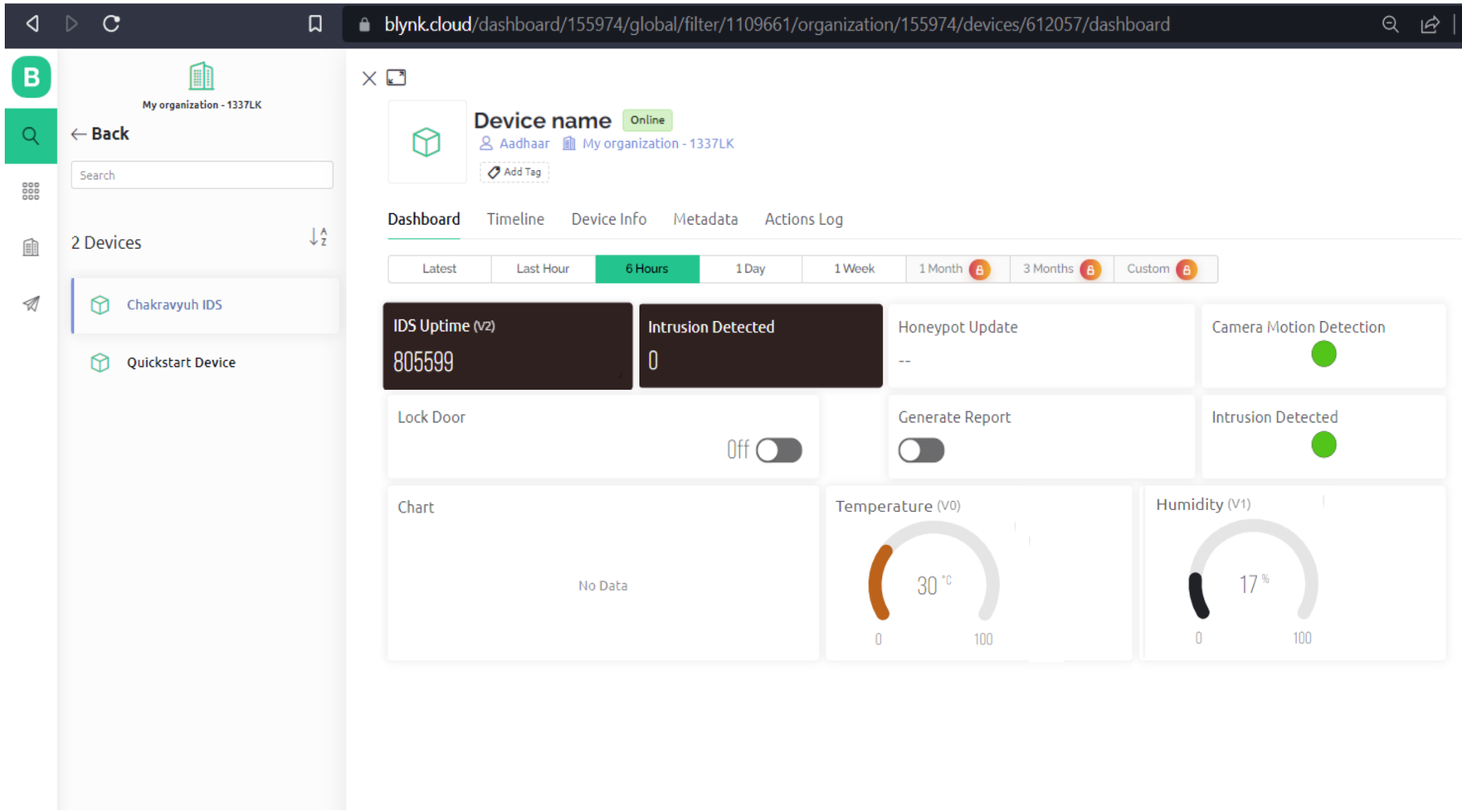


TEMPERATURE AND
HUMIDITY SENSOR



ULTRASONIC SENSOR

BLYNK CLOUD DASHBOARD



Features

* Real time sensor readings

* Seamless UI

* Integratable API Key

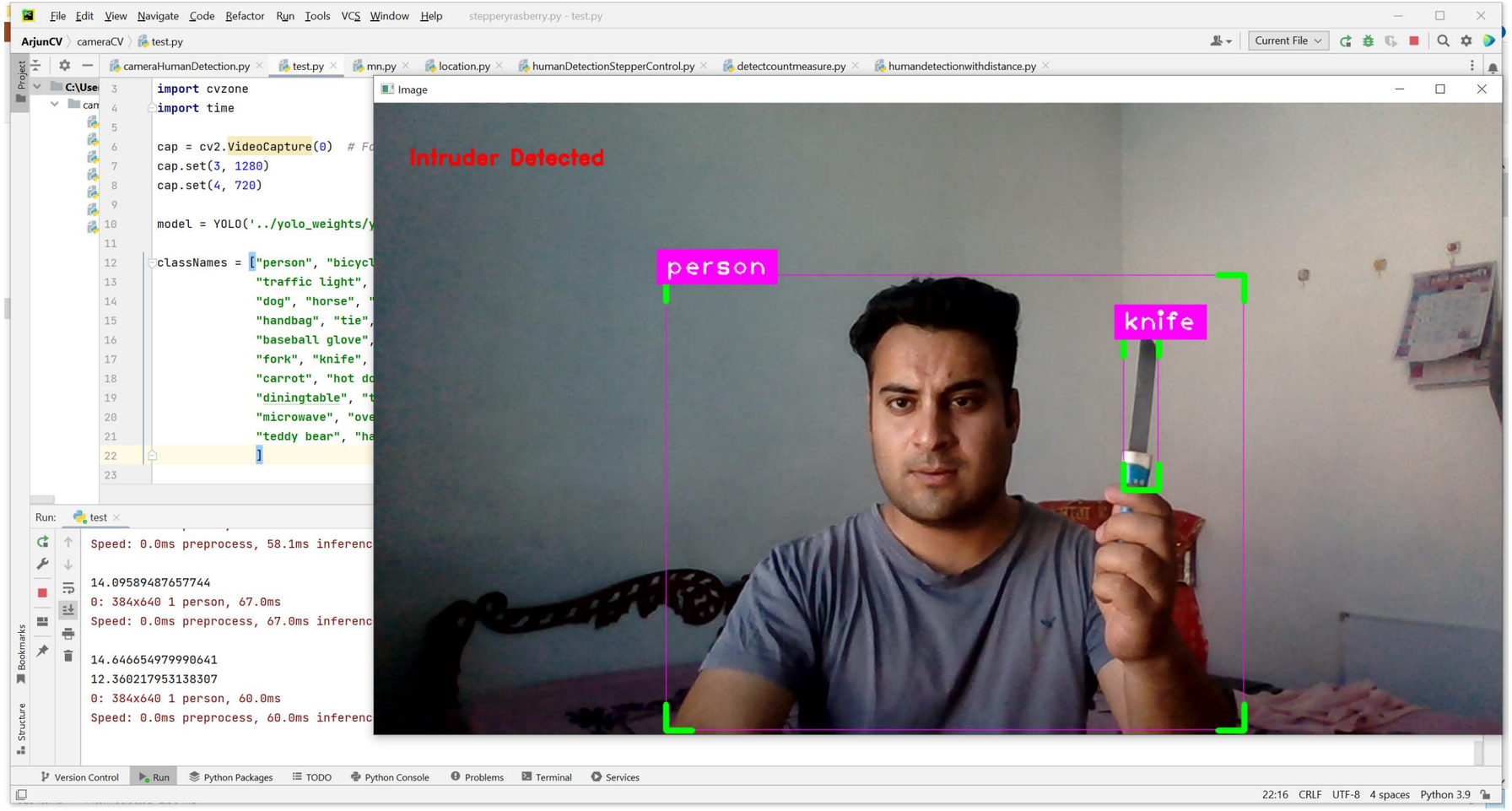
* Mobile and Web based platforms available.

* Drag and Drop Modular / admin dashboard

* Receive real time push and email notifications.

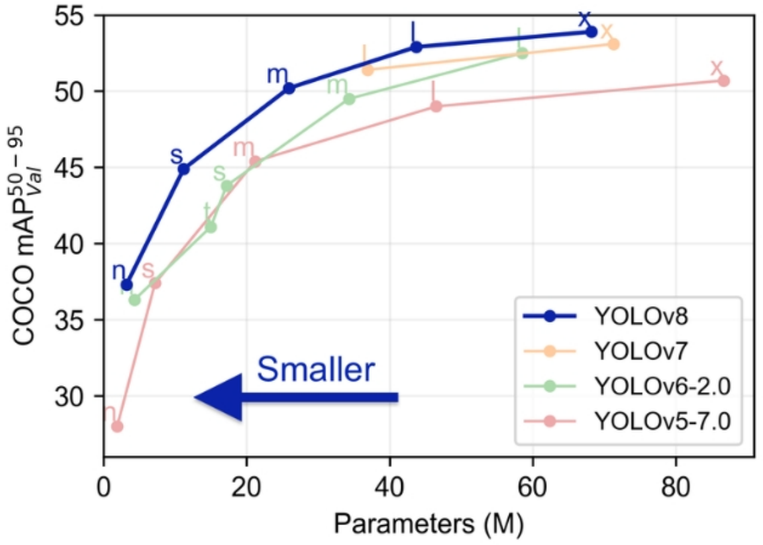
* Modular

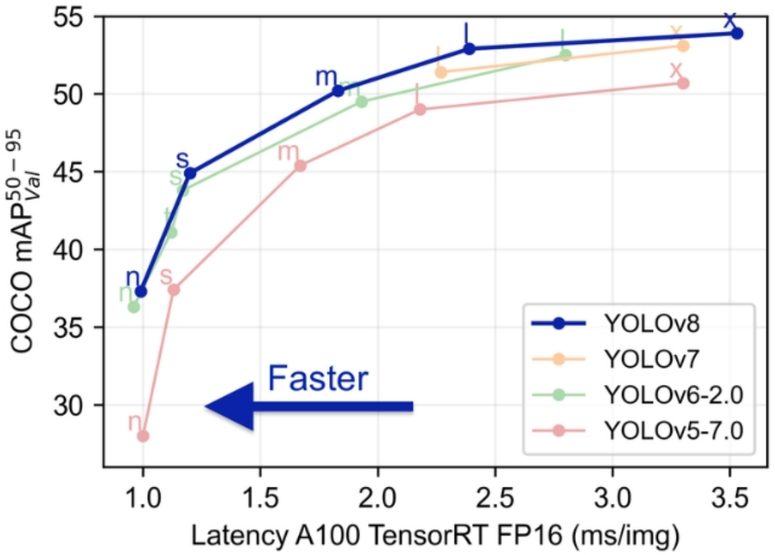
COMPUTER VISION MODULE



Features

* Anchor free Detection
* mAP(mean average precision) = 68.5%
* CSPDarknet53 architecture
* Processes 81 frames per second
* Object localization
* Real Time Database Comparison





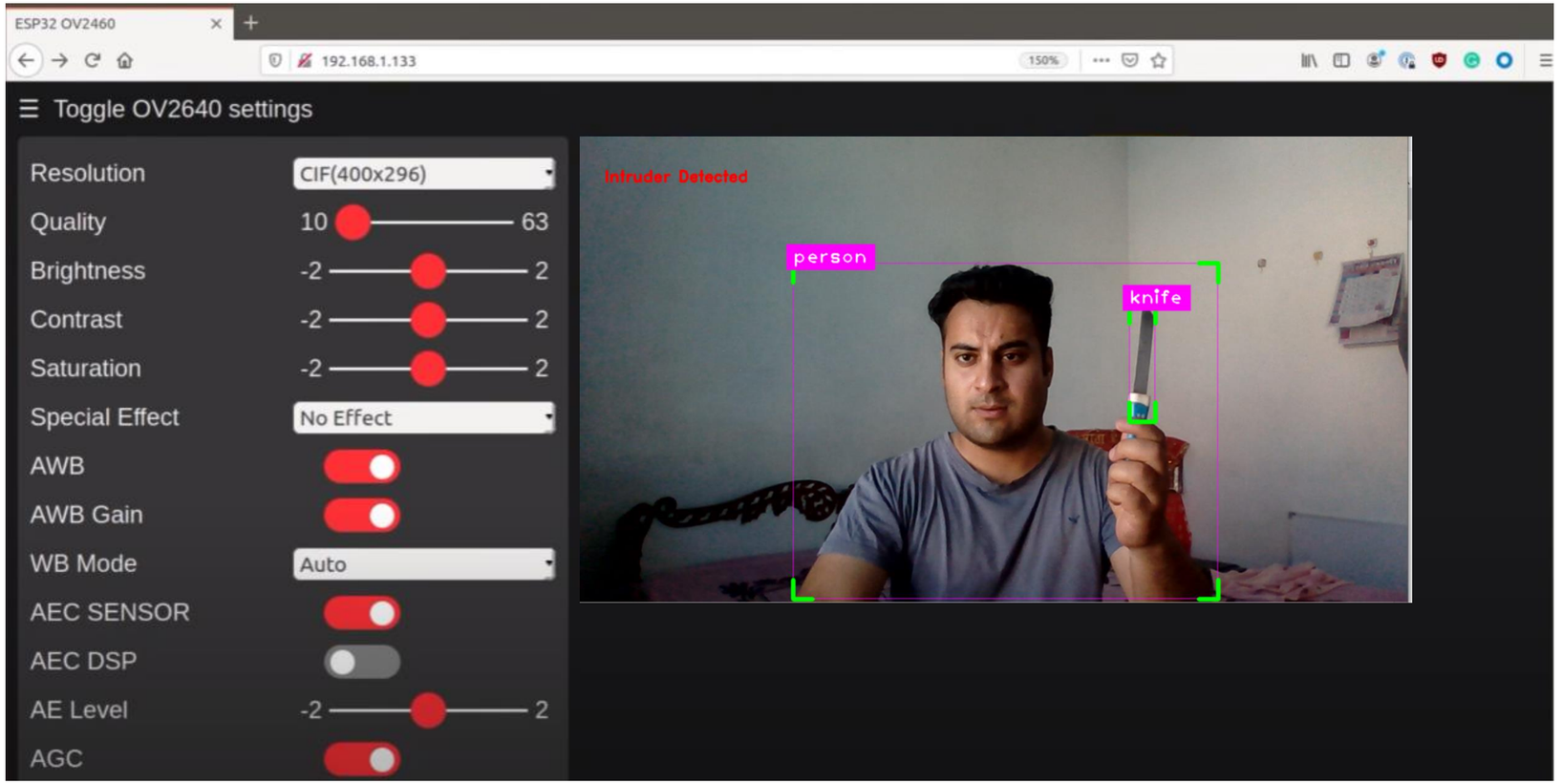
Performance Comparison of YOLOv8 vs YOLOv5

Model Size	Detection#	Segmentation#	Classification*
Nano	+33.21%	+32.97%	+3.10%
Small	+20.05%	+18.62%	+1.12%
Medium	+10.57%	+10.89%	+0.66%
Large	+7.96%	+6.73%	0.00%
Xtra Large	+6.31%	+5.33%	-0.76%

#Image Size = 640 *Image Size = 224

Traction

SURVEILLANCE DASHBOARD



Features

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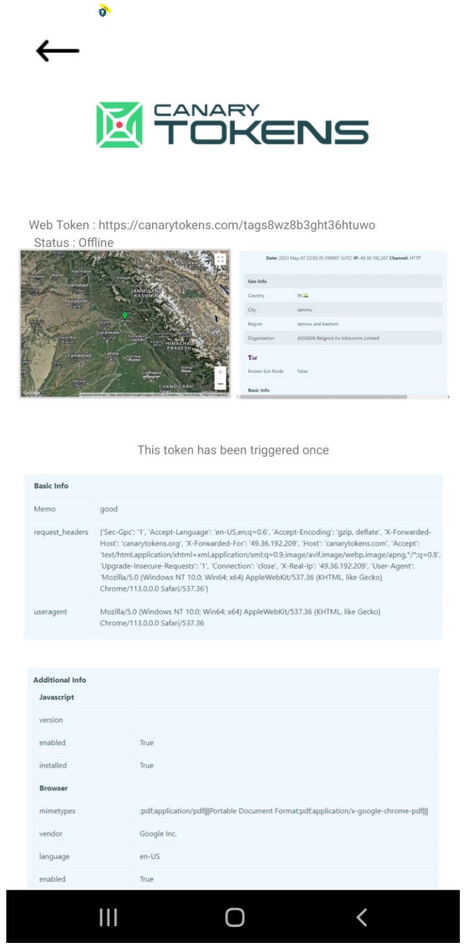
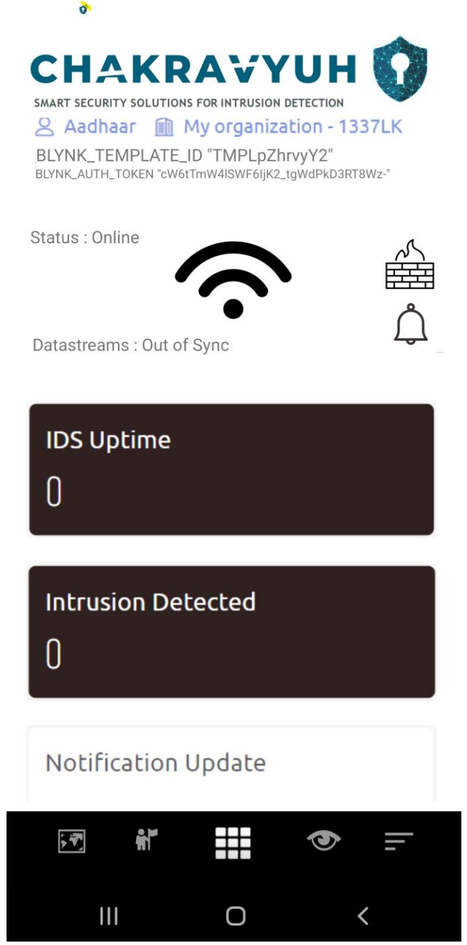
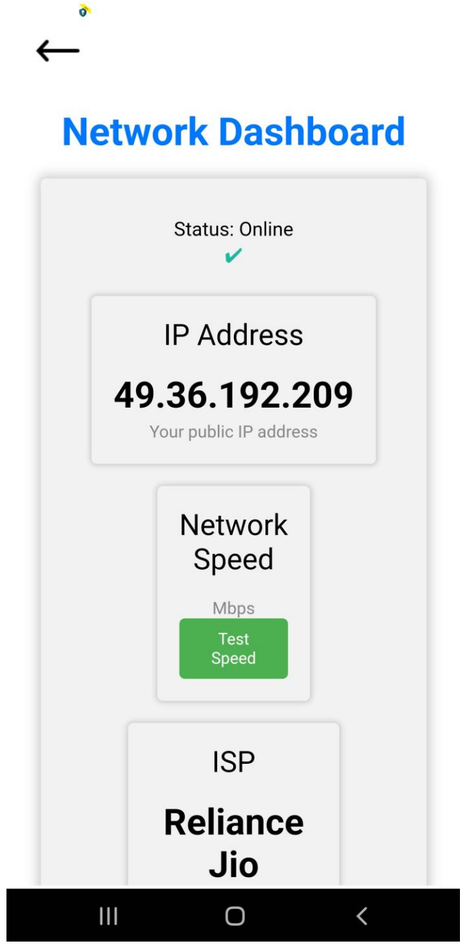
ADMIN CONTROL APPLICATION







Features

* Real time Sensor Readings
* Push Notification
* Seamless Interface
* Admin Login Functionality
* Supported version of Android6.0 and Above
* Analytical report Dashboard
* Remote access functionality
* AR control Functionality

Test it Out on your device:

Target Market

- General Public
- Government Agencies
- Companies / Enterprises
- Large Scale Industries
- Small scale Industries

Direct Competitors

- McAfee Host IPS
- Cisco IDS/IPS

Indirect Competitors

- Wipro
- Crowd strike Falcon
- Cylance PROTECT

DEMONSTRATION

Future Roadmap

Step 1

Increased Use of AI and Machine Learning

Step 2

Integration with Cloud- Based Security

Step 3

Expansion of IoT Security

Step 4

Embedded AR functionality

Meet our Team

Aadhaar Koul

Networking & IoT Engineer

Baseer Fatima

IoT , Cloud & Integrations Engineer

Navneet Kaur

IoT , Cloud & Integrations Engineer

Arjun Charak

AI/ML & AR Engineer

QUESTIONS ?

THANK YOU