AIV-100 System

User Manual

Version 0.1 – Alpha
(For Customer Use)

CTI Plus Corporation

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ABOUT THIS MANUAL

This manual is applicable to AIV-100 System.

The manual includes instructions for using and managing the product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to the firmware updates or other reasons. Please find the latest version of this manual on the www.ctione.com

Legal Information

Important legal information can be accessed in writing on the

www.ctione.comPLEASE READ THIS INFORMATION BEFORE USING THE AIV-100 SYSTEM.

Disclaimer of Warranties

EXCEPT AS SET FORTH IN THE WARRANTY AGREED UPON OR EXPRESS WARRANTY CONTAINED IN THE WARRANTY PAGE ENCLOSED WITH THE PRODUCT, THE PURCHASER TAKES THE PRODUCT "AS IS", AND CTI Plus Corporation MAKES NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING BUT NOT LIMITED TO THE MERCHANTABILITY OF THE PRODUCT OR ITS FITNESS FOR ANY PARTICULAR PURPOSE OR USE.

REGARDING THE PRODUCT WITH INTERNET ACCESS, THE USE OF THE PRODUCT SHALL BE WHOLLY AT YOUR OWN RISK. CTI Plus Corporation SHALL NOT TAKE ANY RESPONSIBILITIES FOR ABNORMAL OPERATION, PRIVACY LEAKAGE OR OTHER DAMAGES RESULTING FROM CYBER ATTACK, HACKER ATTACK, VIRUS INSPECTION, OR OTHER INTERNET SECURITY RISKS.

SURVEILLANCE LAWS VARY BY JURISDICTION. PLEASE CHECK ALL RELEVANT LAWS IN YOUR JURISDICTION BEFORE USING THIS PRODUCT IN ORDER TO ENSURE THAT YOUR USE CONFORMS TO THE APPLICABLE LAWS. CTI Plus Corporation SHALL NOT BE LIABLE IN THE EVENT THAT THIS PRODUCT IS USED WITH ILLEGITIMATE PURPOSES.

Regulatory Information

FCC Information

Please take notice that any changes or modifications not expressly approved by CTI Plus Corporation could void your authority to operate the device. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

SAFETY INSTRUCTION

These instructions are meant to ensure that the user can use the product correctly to avoid danger or property loss.

The precaution measure is divided into “Warnings” and “Cautions”

Warnings: Serious injury or death may occur if any of the warnings are neglected.

Cautions: Injury or equipment damage may occur if any of the cautions are neglected.

	
Warnings: Follow these safeguards to prevent serious injury or death.	**Cautions:** Follow these precautions to prevent potential injury or material damage.

 **Warnings**

- In the use of AIV-100 System, you must be in strict compliance with the electrical safety regulations of the nation and region. Please refer to technical specification for detailed information.
- Do not connect several devices to one adapter as adapter overload may cause over-heating or fire hazard.
- Please make sure that the plug is firmly connected to the power socket. When the product is mounted on wall or ceiling, the device shall be firmly fixed.
- If smoke, odor, or noise rise from the device, turn off the power at once and unplug the power cable, then please contact the service center.
- Proper configuration of all password and other security settings is the responsibility of the installer and/or end-user.

 **Cautions**

- Make sure the power supply voltage is correct before using the AIV-100 System.
- Do not drop the AIV-100 System or subject it to physical shock.
- Do not place the AIV-100 System in extremely hot, cold (The operating temperature shall be 10°C to 60°C), dusty or damp condition.

- To avoid heat accumulation, good ventilation is required for operating environment.
- Keep the AIV-100 System away from liquid while in use.
- While in delivery, the AIV-100 System shall be packed in its original packing or similar.
- Regular part replacement: a few parts of the equipment shall be replaced regularly according to their average enduring time. Therefore, regular checking is recommended for all users. Please contact with CTI Plus Corporation for further details.
- If the product does not work properly, please contact the CTI Plus Corporation for support. Never attempt to disassemble the AIV-100 System yourself.

TABLE OF CONTENTS

INTRODUCTION - TODO

1. AIV-100 SYSTEM APPEARANCE

AIV-100 System has two separate types. The Type 1 is a Stand-alone configuration where it could run independently without any network or internet connection. The Type 2 supports all functions developed by CTI Plus Corporation, but it requires stronger computer. The list for the Types will be as follows:

1.1 Type 1

Following is the Type 1 System Configuration diagram:

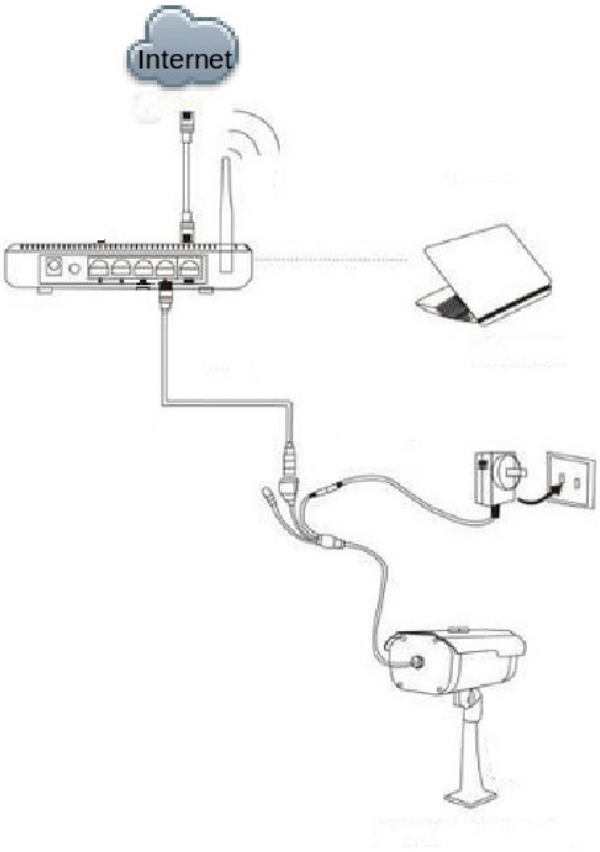

Figure 1.1 Type 1 System Configuration

In this system configuration, the module runs independently on a single laptop. All the process for functions were run on the laptop. Then, the results will be displayed in the modern browser (such as Mozilla Firefox or Google Chrome browser).

1.2 Type 2

Following is the Type 2 System Configuration diagram:

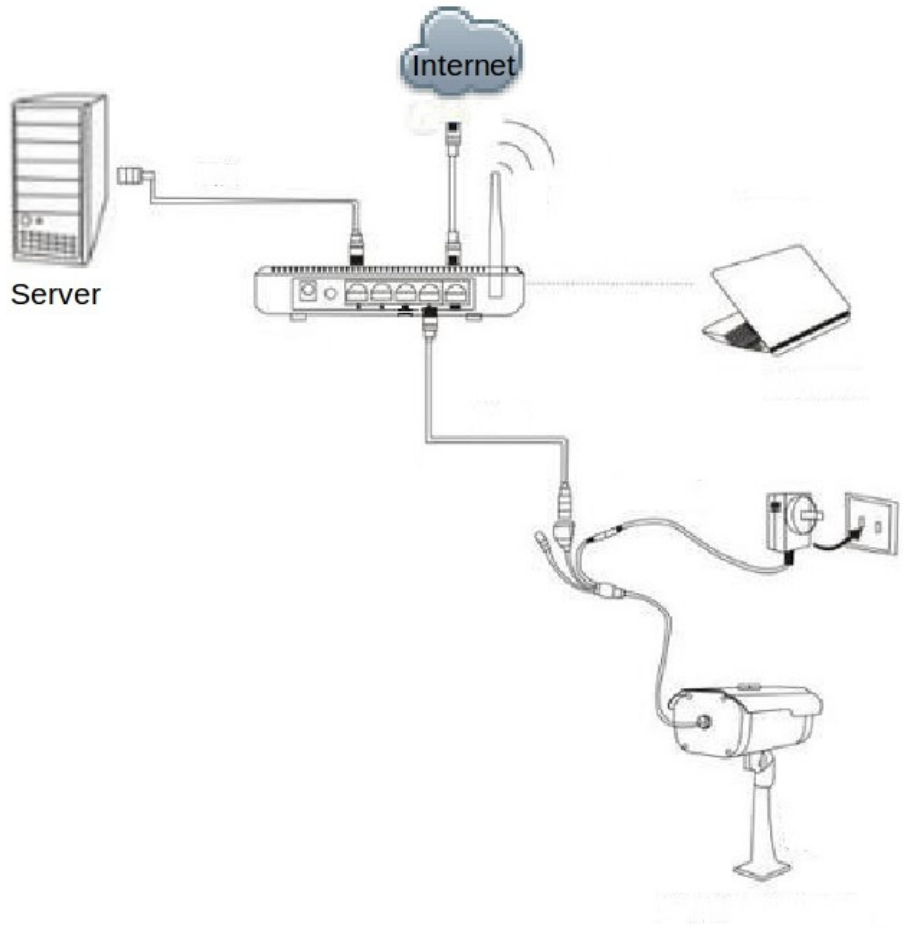

Figure 1.2 Type 2 System Configuration

In this system configuration, it consists of a laptop / computer with the internet connection as a client and the process of the program will be done on the computer as the server. Notice that in this architecture, the client will be quite lightweight. The server will process the modules separately on the remote location. It requires more power and a GPU. The hardware specifications are shown in Table 3.2.

2. TYPES AND FUNCTION SUPPORT LIST - TODO

The AIV-100 System has six functions that are readily available for use right now. However, a minimum computation power necessary to meet the demands of the functions. Therefore, not all functions supported in Type 1. Following is the list of all function and which platform it supports (To see how this function works, see page 17):

Type 1	Type 2
1. A 2. B 3.	1. Employee Absence 2. Employee Attendance 3. Employee Stand Guard 4. Guard Facial Recognition 5. Not Standing Up for Service 6. Reception Area Object Displacement

Table 2.1 Architecture with the type of module run on it.

3. SYSTEM PREREQUISITES

3.1 Hardware Requirements

Following is the hardware requirements for each Types:

	Type 1	**Type 2**
	For the Laptop / Computer:	**For the Client:**
Operating System	Ubuntu 14.04 LTS	Ubuntu 14.04 LTS or later
Computer and Processor	Intel core i5-6200U @ 2.30GHz or faster	Intel core i5-6200U @ 2.30GHz or faster
Memory	8GB of RAM or bigger is recommended	8GB of RAM or bigger is recommended
GPU Requirement	Minimum Nvidia GeForce 940M or faster	-
Disk Space	At least 100 Gb of free disk	At least 20 Gb of free disk
Network	Cisco Lynksys EA9200	Cisco Lynksys EA9200
Display	1024x768 resolution or higher	1024x768 resolution or higher
		For the Server:
Operating System		Ubuntu 14.04 LTS
Computer and Processor		Intel core i7-8700 @ 3.20GHz (12 core) or faster is recommended
Memory		16GB of RAM or bigger is recommended
GPU Requirement		Nvidia GeForce GTX 1060 with 6GB Video memory or bigger
Disk Space		At least 280 GB of free disk
Network		Fast enough network to upload video

Table 3.2 Hardware requirements for each architecture

3.2 Software Requirement

Following is the software requirement for each device used in the architecture:

<table>
<tr><th>Stand-alone Architecture</th><th>GPUSRV Architecture</th></tr>
<tr><td>For the Laptop / Computer:</td><td>For the Client:</td></tr>
<tr><td rowspan="3">Python
Tensorflow
OpenCV</td><td>Any modern browser that’s capable of streaming online videos (Example: Google Chrome or Mozilla Firefox)</td></tr>
<tr><td>For the Server:</td></tr>
<tr><td>Python
Tensorflow
OpenCV</td></tr>
</table>

Table 3.3 Software requirements for each architecture

4. INSTALLATION

Before you start:

- Make sure the device is in good condition and turned on.

4.1 Client / Laptop Access – TODO

The AIV-100 System can be accessed using modern browser (like Mozilla Firefox or Google Chrome). Each Type needs to be accessed a bit differently.

4.1.1 Type 1

Follow these steps to access the AIV-100 System user interface:

1. Connect your computer using wifi to the
2. Use the Username: xxxx
3. Password: xxxx
4. Wait until it connects.
   [insert photo]
5. Open the web browser.
6. Browse to 127.0.0.1:8080/home
   [insert photo]

7. And the home page will be shown as follows:
   [insert photo]

4.1.2 Type 2

Follow these steps to access the AIV-100 System user interface:

8. Connect your computer using wifi to the
9. Use the Username: xxxx
10. Password: xxxx
11. Wait until it connects.
    [insert photo]
12. Open the web browser.
13. Browse to 192.168.1.99:8080/home
    [insert photo]

14. And the home page will be shown as follows:
    [insert photo]

5. HOME GUI (GRAPHICAL USER INTERFACE) – TODO

5.1 Home Page

From home page, there is some statistics for each function. And user can click the menu on the left to access the feature of AIV-100 System. And it contains all function link, user can directly see the whole structure about our system.

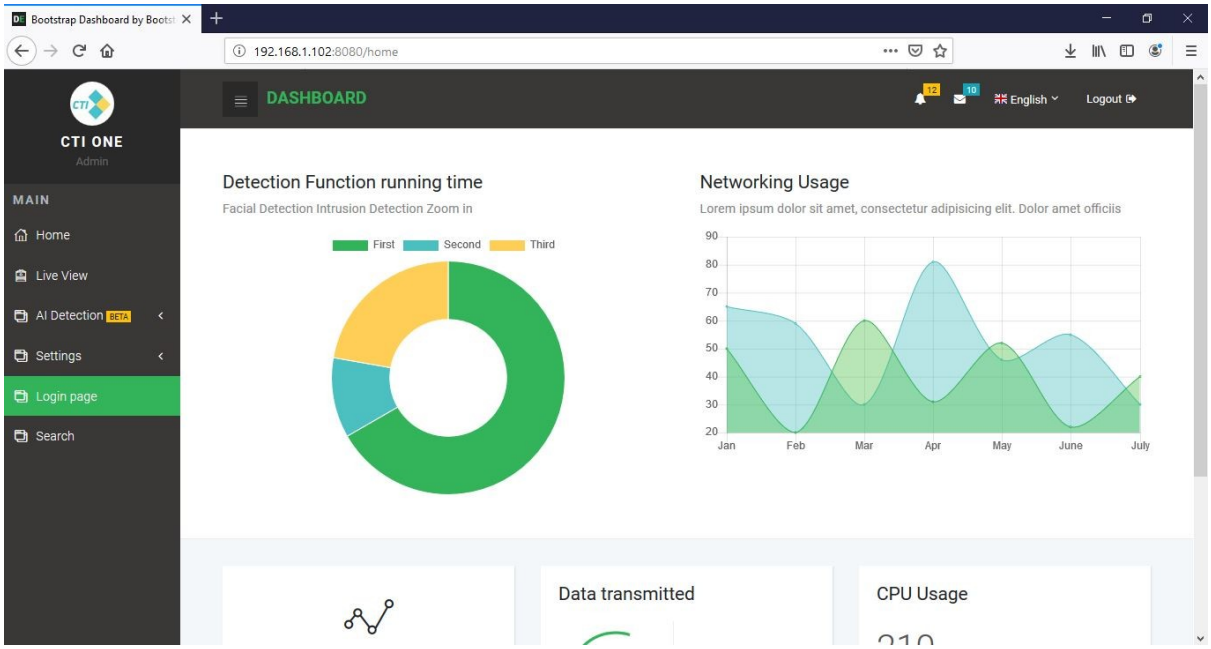

Figure 5.3 AIV-100 System Home Page

5.1.1 Top Bar Menu

This menu is where the logout and language can be set.

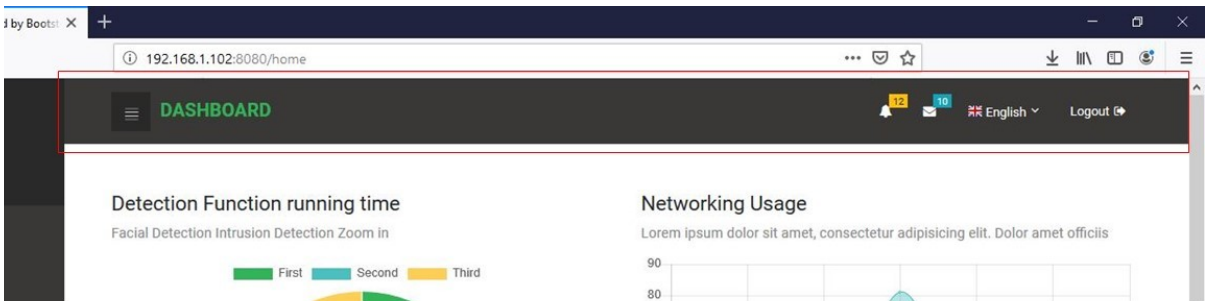

Figure 5.4 AIV-100 System Top Bar Menu

5.1.2 Side Bar Menu

This menu contains the function which will be shown in the browser.

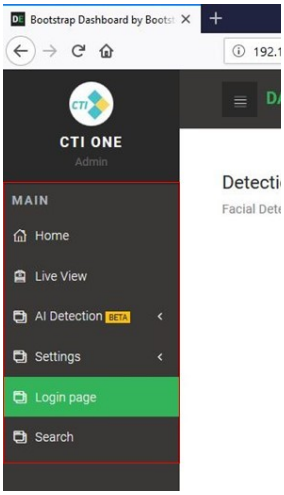

Figure 5.5 AIV-100 System Side Bar Menu

6. FUNCTIONS SUPPORTED BY AIV-100 SYSTEM

Following is the sample display of the functions supported by AIV-100 System:

6.1 Employee Absence - TODO

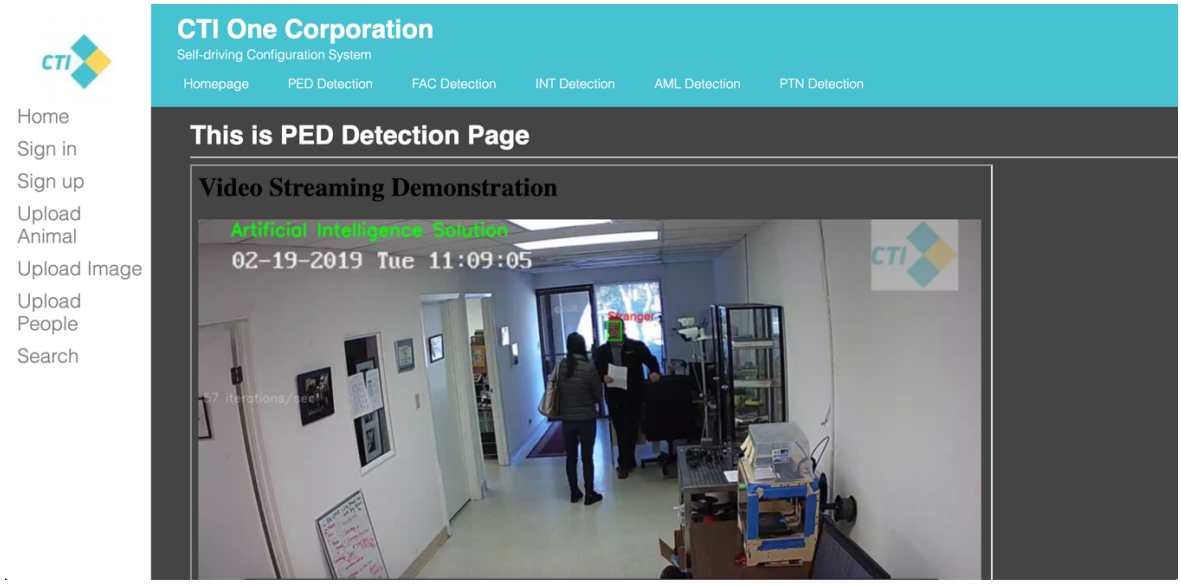

Figure 7.1 Pedestrian Detection Result.

After install pedestrian detection function, there is frames on each pedestrian on live streaming. In Figure 7.1, we can see the result on output streaming.

6.2 Employee Attendance - TODO

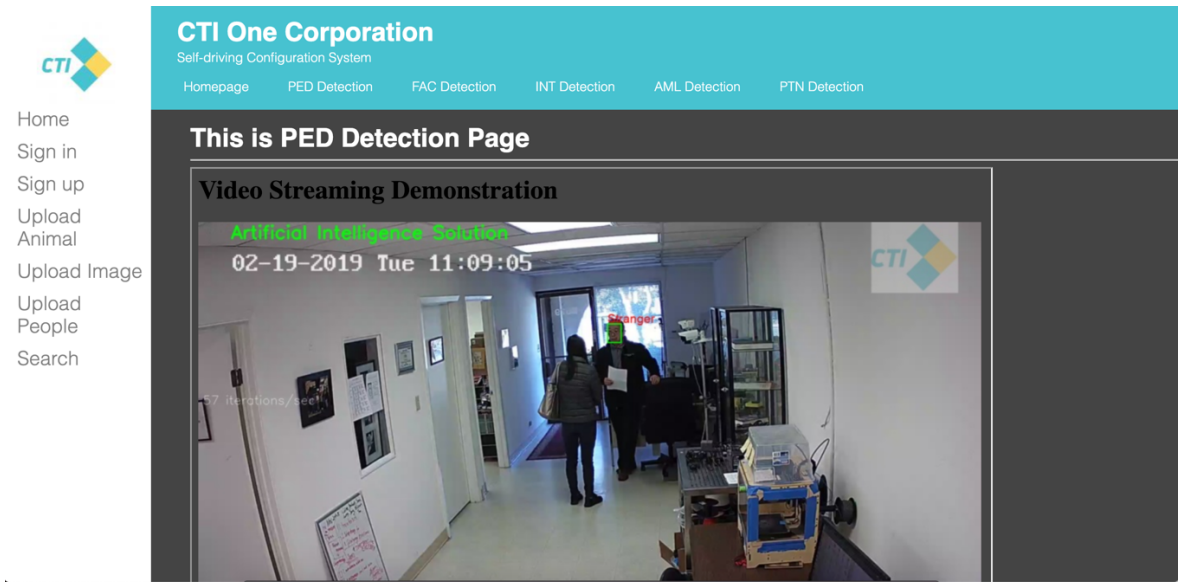

Figure 8.1 Facial Detection Result.

After install facial detection function, there are two types of frames on different people. If Database contains people's information; it will show green frame with their name. If Database doesn't contain information; it will show red frame with "stranger" title. When It detects one person, it will save the frame as image and upload it to database.

In Figure 8.1, we can see the result on output streaming.

6.3 Employee Stand Guard - TODO

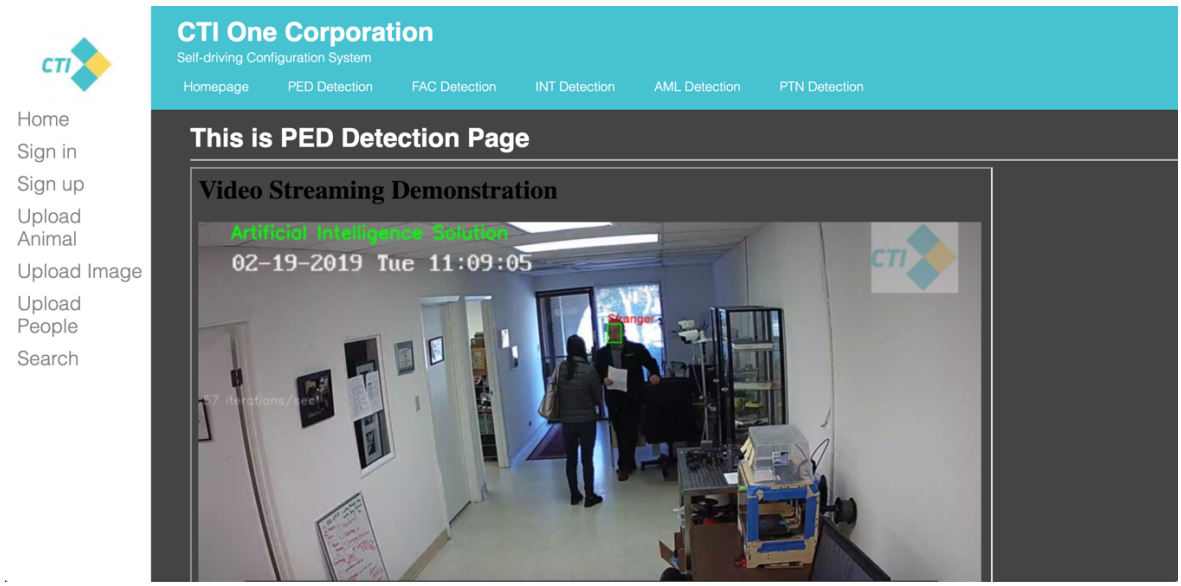

Figure 9.1 Intrusion Detection Result.

After install intrusion detection function, user can use mouse to se a frame on video Streaming to record a short video when some things were moved. The video will be saved In local server.

In Figure 9.1, we can see the result on output streaming.

6.4 Guard Facial Recognition - TODO

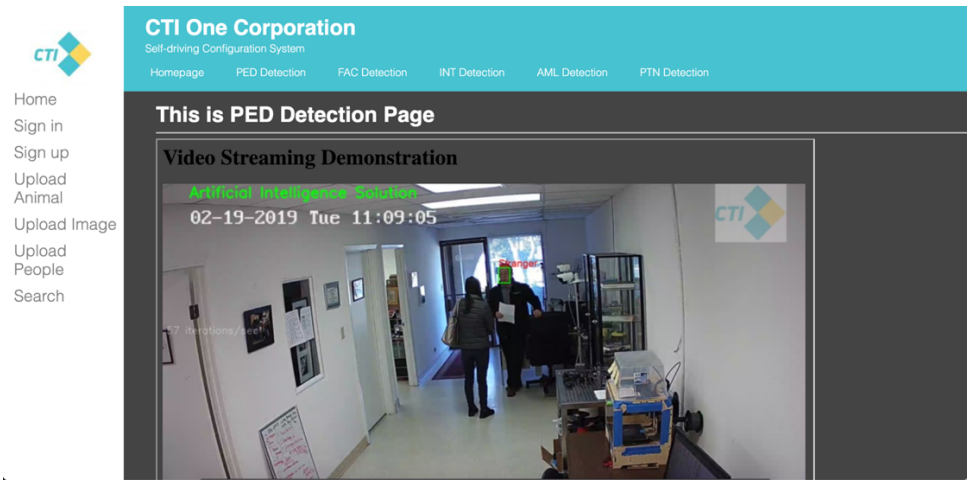

Figure 10.1 Animal Detection Result.

After install animal detection function, live video streaming will distinguish the type of animal. User can see the animal information which was saved in database.

In Figure 10.1, we can see the result on output streaming.

6.5 Not Standing Up for Service - TODO

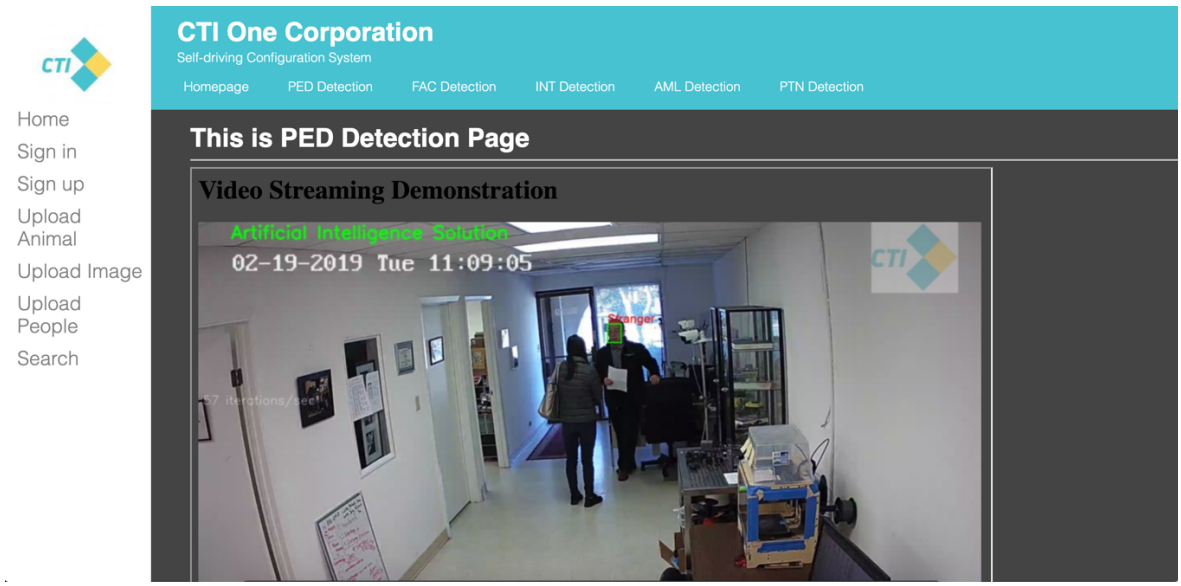

Figure 11.1 Plate Number Detection Result.

After install plate number detection function, for different types of plates, it will show their plate numbers.

In Figure 11.2, we can see the result on output streaming.

6.6 Reception Area Object Displacement – TODO

7. UPLOAD CONFIGURATION - TODO

7.1 Upload Animal Attributes - TODO

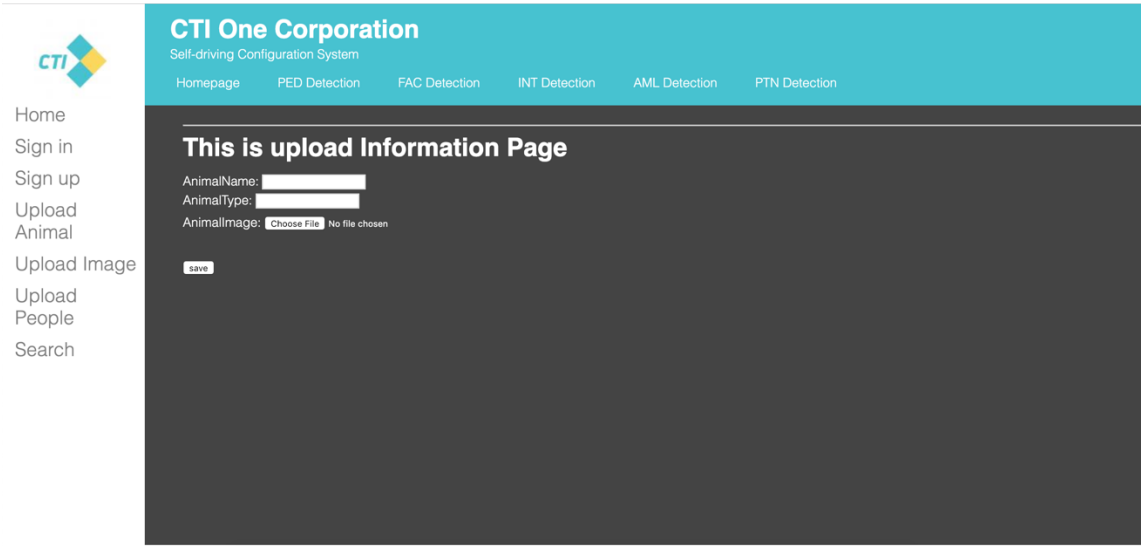

Figure 12.1 "Upload Animal" Function.

User need to upload animal information with three attributes:

1. Animal name

2. Animal Type: Big/Medium/Small

3. Animal Image

Using "submit" button, animal information will upload to "animal infos" table.

In Figure 12.1, we can see these attributes.

7.2 Upload People Attributes – TODO

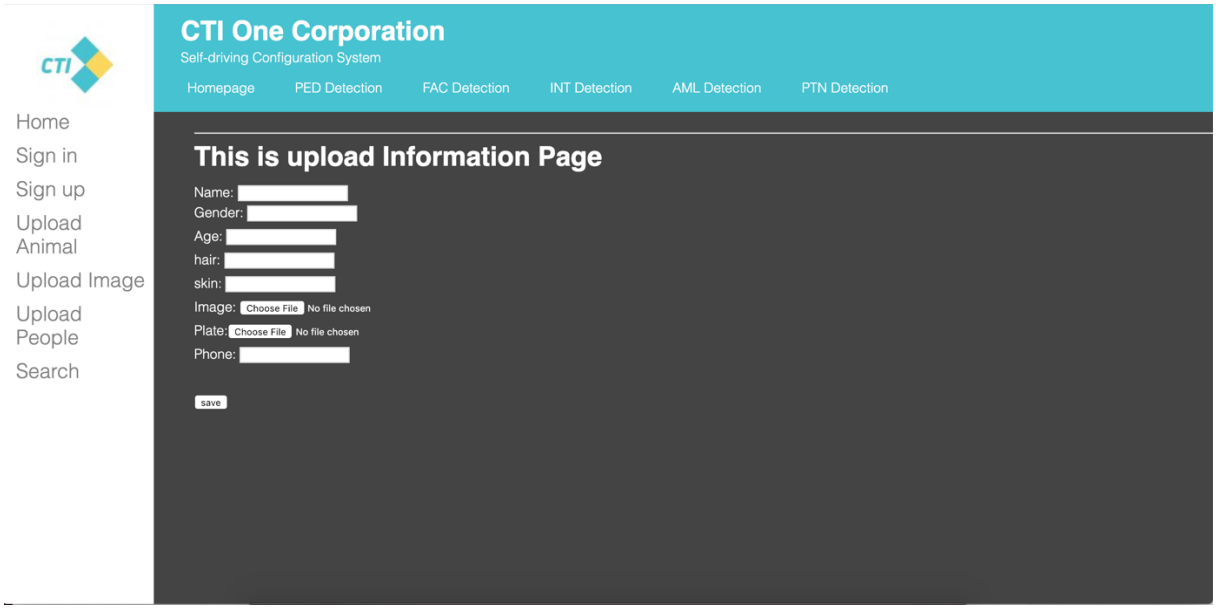

Figure 13.1 "Upload People" Function.

User need to upload people information with eight attributes:

User need to upload people information with eight attributes:

1. Name

2. Gender: male/female

3. Age

4. Hair color

5. Skin color

6. People Image

7. Plate Number

8. Phone Number

Using “submit” button, people information will upload to “people infos” table.

In Figure 13.1, we can see these attributes.

8. SEARCH FUNCTION - TODO

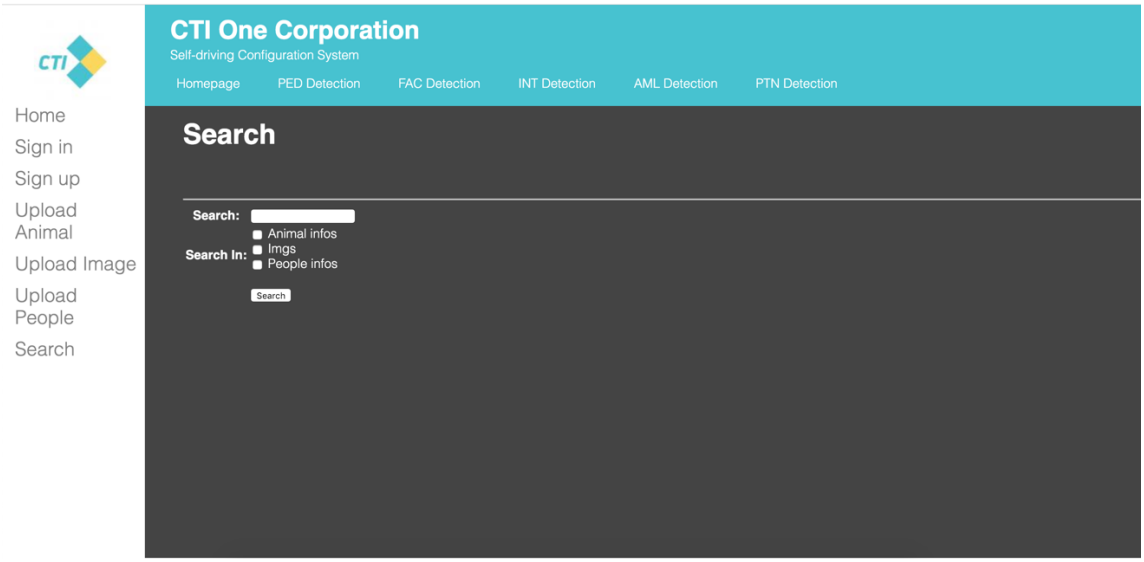

Figure 14.1 “Search” Function.

User need to choose three tables to search different information:

1. Animal infos

   Include animal type, animal image and animal name

2. Imgs

   Include image of facial reconginition result, time stamp, result location and the result name

3. People infos

   Include image, name, gender, age, skin color, hair color, plate number, phone number

Type multi keywords like “people name+location/animal name+type/…” and choose table to do an accuracy search.

When input more keywords it will get more clearly result. The result will be shown as a list.

In Figure 14.1, we can see these choices.

9. SUMMARY - TODO

AIV-100 System combine modern AI recognition technology with back-end big data statistics, use network communication protocols and database connection technology to quickly and safely and consistently present the analyzed results to users. AIV-100 System, after installation through the above steps, can be used in real-time monitoring such as hotel management, company monitoring, security systems, community entrances and exits, and crowded places in public places, timely feedback to users, real-time for unexpected situations deal with.

APPENDIX A TROUBLE SHOOTING

APPENDIX B HOW TO GET HELP