

Safety Vest & Helmet Compliance App Installation & Setting Guide

Version 2.1

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1. Introduction

Purpose

This document is intended to provide guidelines for the installation and configuration of Safety Vest & Helmet Compliance Application on iPRO camera.

The performance of the application depends on the on-site environment such as camera position, angle of view and surrounding environment.

We recommend the appropriate installation, and the configuration based on this guidelines to get the best performance.

Goal

Targeting to acquire the following skills.

1. Installing the application
2. Planning the camera position based on the floor plans and on-site environment
3. Installing cameras at the appropriate angle
4. Application Configuration for Safety Vest & Helmet

2. Specification Sheet

- Types of Personal Protective Equipment (PPE)
 - Vest: typical **bright colors vest** (neon, orange)
 - Helmet: **safety helmet of different colors** (white, yellow, orange, blue, etc.)
- For specific types of equipment not mentioned, customized model is needed, contact us for more details
- Maximum number of people can be detected: 20
- **Ideal condition: 2-10m away** from the camera, less than 10 people, **non-occluded, well-lit** conditions are preferred
- For CV2X cameras, detection speed is **2 FPS** (Frames per second)



3. Overview of Safety Vest & Helmet Compliance App

Core functionality:

1. View whether person is wearing safety vest & helmet through Web Stream
2. Send out alert when person is not wearing safety vest & helmet

1. Web Stream

Red box as person is not compliant

ID 0: 9s

Green box as person is compliant

ID 1: 25s

Gives:
1. Box drawn around object
2. ID + time tracked
3. Confidence

Apr/04/2023 03:21:36PM

ID 0: 9s
Confidence: 68%

ID 0: 25s
Confidence: 68%

ID 1: 25s

2. Alert

VIDEOINSIGHT

15/10/2024 2:24:57 pm 192.168.1.109 - Panasonic - Model: X2251L Helmet_and_Vest_missing Other info: Helmet_and_Vest_missing:3s Detected score: N/A

Date / Time	Thumbnail	Event
DD-MM-YYYY hh:mm:ss		Helmet_and_Vest_m issing: 3s

Application Architecture

Safety Vest & Helmet App



Metadata

- 1. Image of people non-compliant
- 2. Date / Time
- 3. Non-compliance time

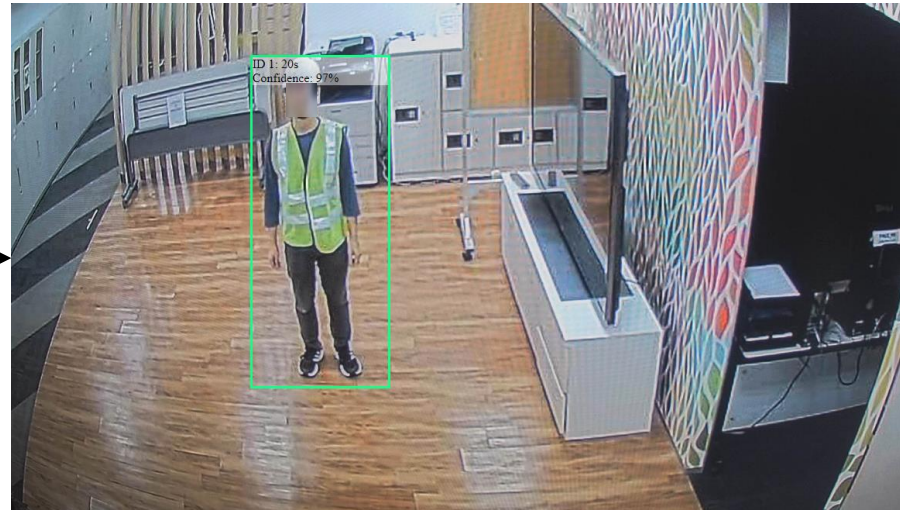
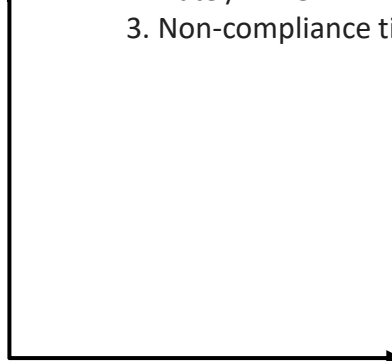


Store metadata

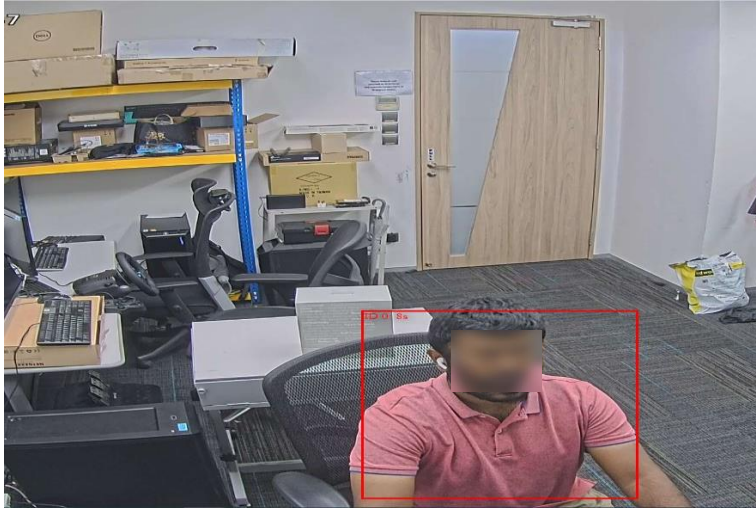


Metadata

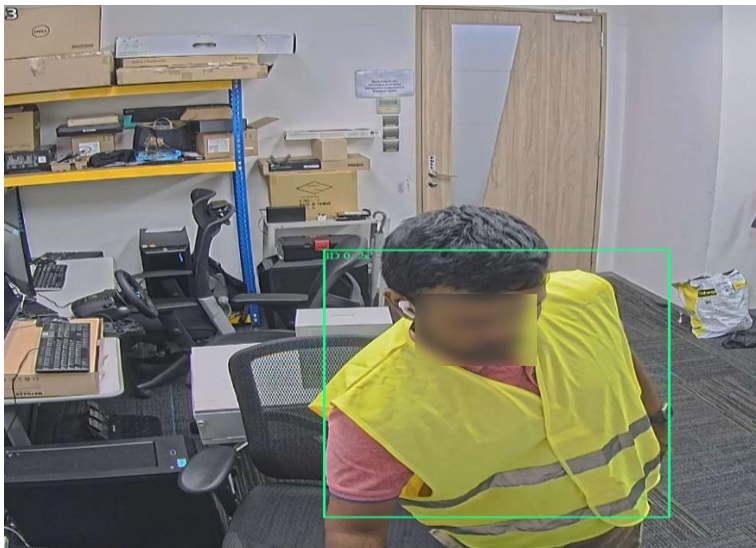
Visualize metadata



Non-Compliant case

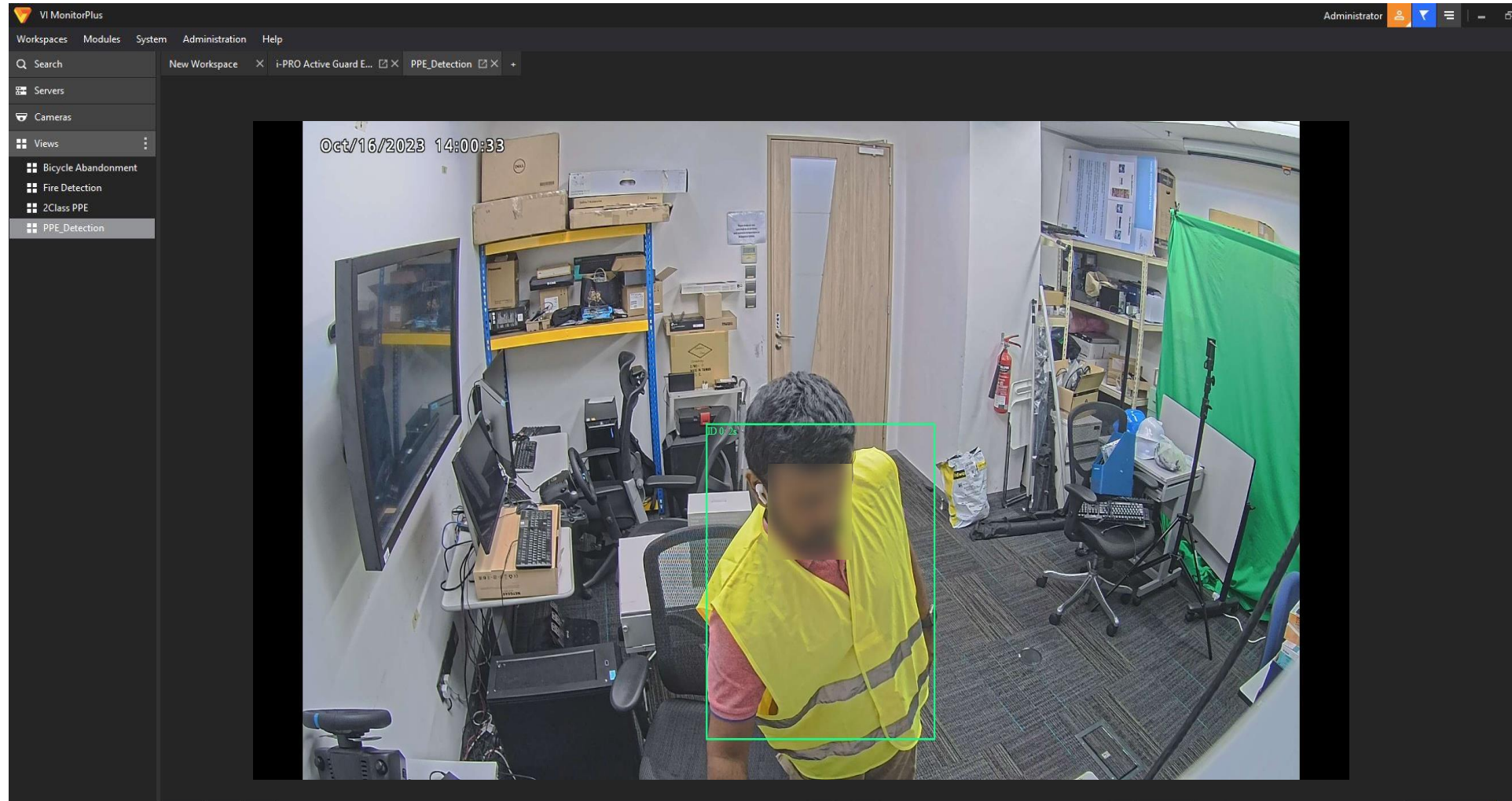


Compliant case



- Accessed via URL
- Easily differentiate people that are
 - Compliant
 - Non-compliant
- Modify settings to suit different needs
 - Detection confidence
 - Which cases to alert (helmet or vest or both)
 - Draw Region-of-Interest (ROI) for detection
- Register license key to activate product

- Web Stream can be accessed on Video Insight



Video Insight (Alert)

Date / Time	Camera	Event	Detected	Registered	Details	Status	Comments	Live
9/15/2023 3:04:02 PM	192.168.1.230 - Model: Panasonic / i-PRO S25700-V2L	Vest_missing		—	Other info: Vest_missing:3s Detected score: N/A	New		
9/15/2023 3:03:11 PM	192.168.1.230 - Model: Panasonic / i-PRO S25700-V2L	Vest_missing		—	Other info: Vest_missing:3s Detected score: N/A	New		
9/15/2023 3:03:06 PM	192.168.1.230 - Model: Panasonic / i-PRO S25700-V2L	Vest_missing		—	Other info: Vest_missing:3s Detected score: N/A	New		
9/15/2023 3:02:49 PM	192.168.1.230 - Model: Panasonic / i-PRO S25700-V2L	Vest_missing		—	Other info: Vest_missing:3s Detected score: N/A	New		
9/15/2023 2:59:18 PM	192.168.1.230 - Model: Panasonic / i-PRO S25700-V2L	Vest_missing		—	Other info: Vest_missing:3s Detected score: N/A	New		
9/15/2023 2:57:42 PM	192.168.1.230 - Model: Panasonic / i-PRO S25700-V2L	Vest_missing		—	Other info: Vest_missing:3s Detected score: N/A	New		
9/15/2023 2:52:57 PM	192.168.1.230 - Model: Panasonic / i-PRO S25700-V2L	Vest_missing		—	Other info: Vest_missing:3s Detected score: N/A	New		
9/15/2023 2:51:02 PM	192.168.1.230 - Model: Panasonic / i-PRO S25700-V2L	Vest_missing		—	Other info: Vest_missing:3s Detected score: N/A	New		

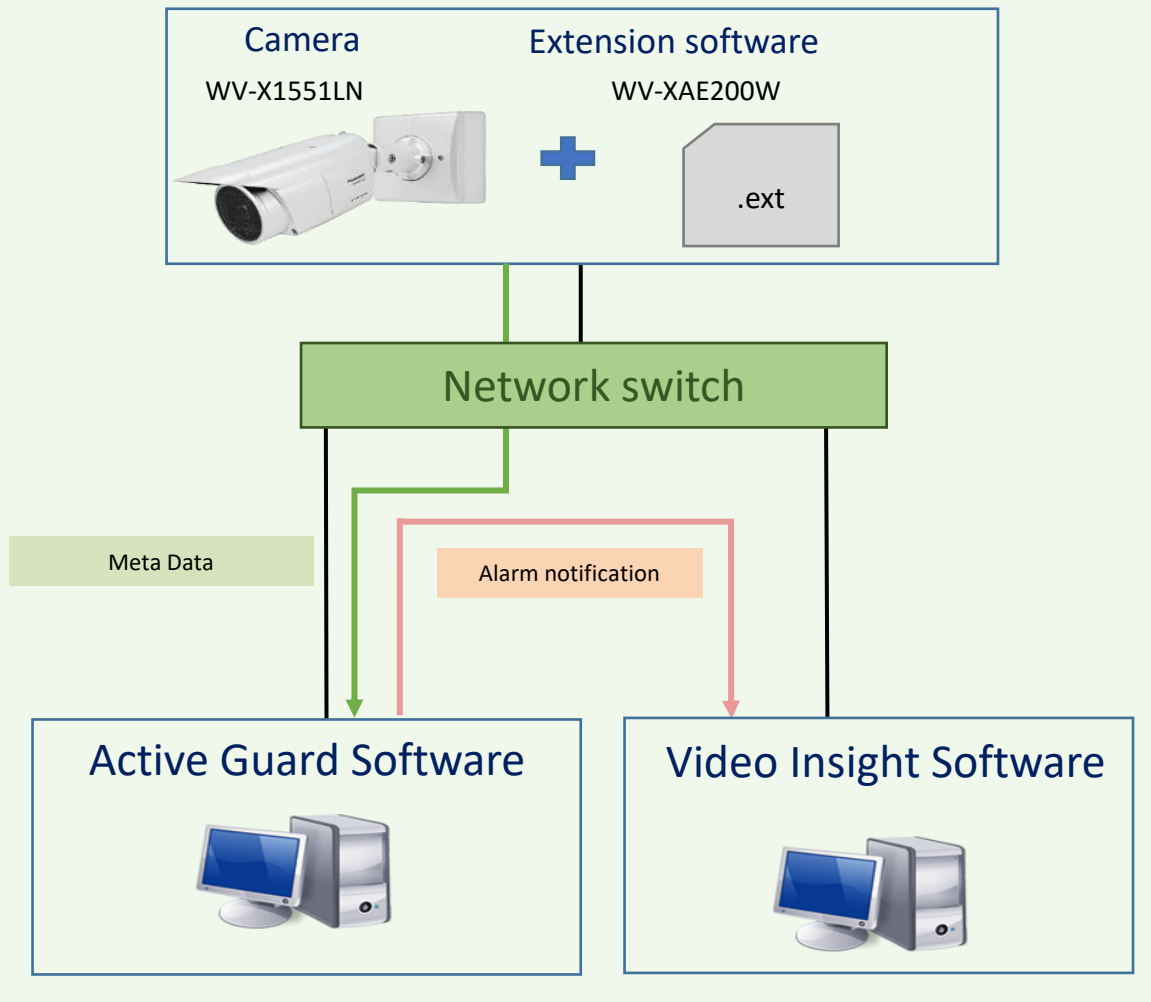
Shows type of events

Click on the thumbnail to show 30 sec (configurable) video of when event occurred

Note
If multiple non-compliant cases are detected – Video Insight will take 5s to display alert for each person

4. Preparation

System Configuration (Example)



Note

- The Active Guard Server and Video Insight can be within the same hardware, does not need to be separate like in this diagram

1. Upgrading Camera Firmware – to the latest firmware

- a. Refer to https://i-pro.com/products_and_solutions/en/surveillance/documentation-database
- b. If i-PRO Configuration tool is available
 - i. Login > Professional mode > Update Firmware

2. Installing Extension

- a. Enter the camera IP on your web browser (e.g. 192.168.0.185)
- b. Navigate to the extension software page (Refer to next slide)
- c. Install the extension (Refer to next slide)

i. AI Camera (2)

Note that navigation will differ depending on camera firmware version.

- 1. Enter camera IP on your web browser
- 2. Initial set up (username and password) if not done so
- 3. Click on (1) Set up (setting icon) > (2) Detailed setting > (3) Extension Software logo

The screenshot displays the web interface for a Panasonic Network Camera (Model WV-S22500-F6L). The top navigation bar includes a settings gear icon labeled (1). Below the main video feed, a 'Detailed setting' button is highlighted with a red box and labeled (2). At the bottom, the 'Ext. software' tab is active, and a specific software icon is highlighted with a red box and labeled (3). The interface also shows various other settings tabs like 'Stream', 'Image quality', 'Zoom', 'Audio', and 'Alarm', along with a 'Screen setting' section for 'Color' and 'Operation panel layout'.

1. Click on Choose File > Select the .ext file to install > Execute
2. After accepting terms and conditions, the application will take a while to install – refresh the page after 45 seconds if the application does not show up

The screenshot shows the web interface for a Panasonic Network Camera (WV-S22500-F6L). The interface is divided into a left sidebar and a main content area. The sidebar includes sections for 'Live', 'Setup', '-Ext. software', '-Easy Setup', and various configuration options like '+Basic', '+Image/Audio', '+Multi-screen', '+Alarm', '+User mng.', '+Network', '+Schedule', '+Maintenance', and '+Support'. The main content area is titled 'Software mng.' and contains a table of system information and a file selection dialog.

Unique information	
MPR ID	AE00-0106-C51E-6A5A
Remaining ROM	103600 kbytes
Remaining RAM	246000 kbytes
SDK version	1.70
Firmware version	2.36

PPE_Detection_App	Uninstall
Software version	V6.2/SDK1.70
Status	Operable
Setup menu	Setup >>

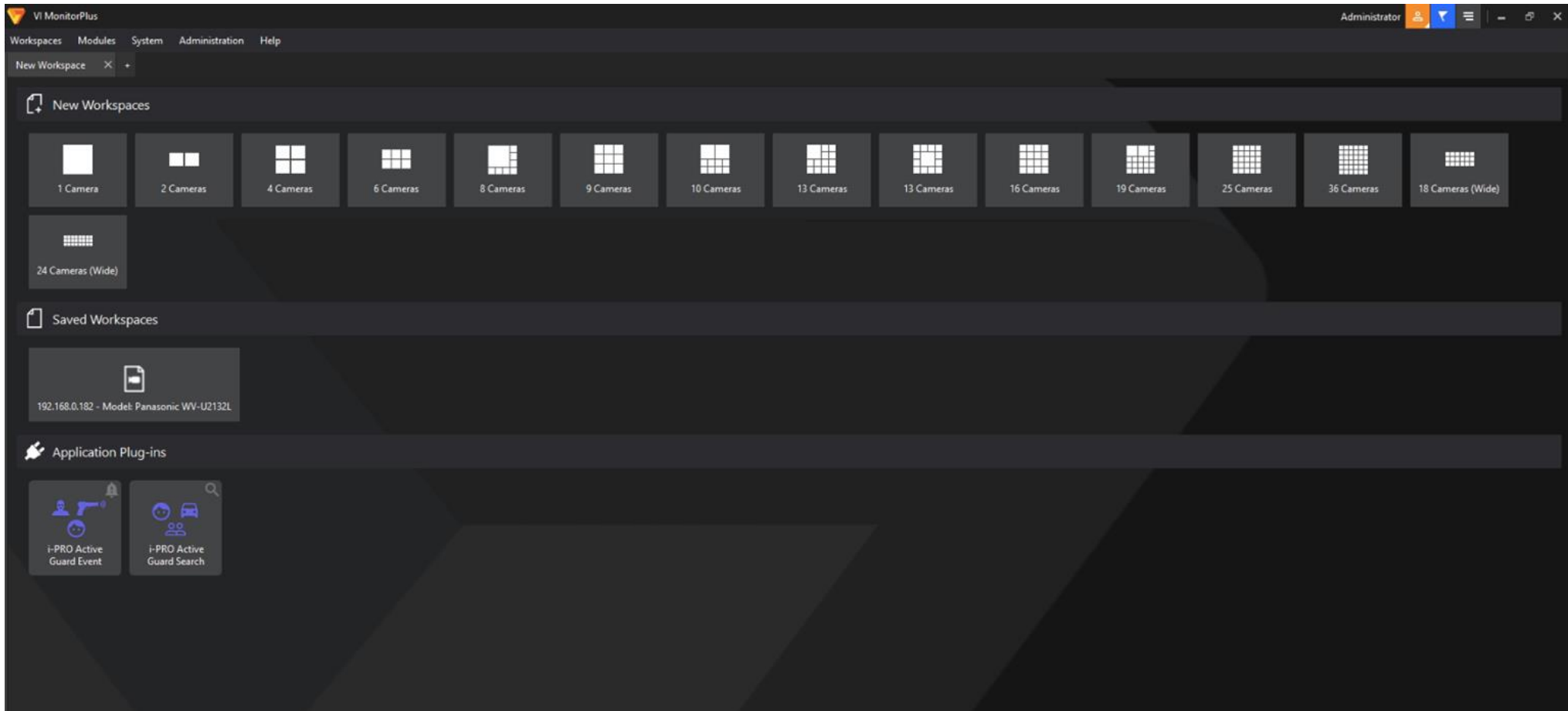
The file selection dialog shows a 'Choose file' button (highlighted with a red box) and a list of options: 'Install new Ext. software' (selected) and 'PPE_Detection_App....Upgrade'. An 'Execute' button (also highlighted with a red box) is visible next to the selected option. Below the dialog, there is a warning: 'Please wait and do not operate the browser during install.'

AI Processor Activation Key	
Register the Registration Key	Registered

ii. Video Insight

1. Installing the latest version of Video Insight

- a. Refer to <http://downloadvi.com/downloads/IPServer/v7.9/V79CompGuide.pdf> (the latest version might be different)



iii. Active Guard (1)

1. Installing and setting up ActiveGuard

- a. Refer to https://i-pro.com/products_and_solutions/en/surveillance/products/multi-ai-system-for-video-insight?defaultTab=documentation

2. Configuring ActiveGuard

- a. After installing ActiveGuard
- b. Go to C:\MultiAI\Backup
- c. Edit 3rdpartyApp
 - i. Add application name
 - ii. Add event name

Note

Remove “;” in front of:

- application_name_1
- event_name_1, 2 & 3

```

3rdpartyApp.config X
C:\MultiAI\Backup> 3rdpartyApp.config
1 # Up to 10 types of 3rd party application can be used in a system.
2 # To enable each line, remove the ";" at the beginning of the line.
3
4 #-----
5 # Application name (mandatory)
6 #-----
7 # It is necessary to match "EXTAPP1"or"EXTAPP2"or ... in the response of "/cgi-bin/getinfo?FILE=1" from camera.
8 # Up to 256 characters using alpha-numeral, hyphen, under score and period as camera's SDK specification.
9
10 application_name_1 = "PPE_detection_App"
11 ;application_name_2 =
12 ;application_name_3 =
13 ;application_name_4 =
14 ;application_name_5 =
15 ;application_name_6 =
16 ;application_name_7 =
17 ;application_name_8 =
18 ;application_name_9 =
19 ;application_name_10 =
20
21 #-----
22 # Event name (mandatory)
23 #-----
24 # It is necessary to match the event name included in the notification from camera.
25
26 event_name_1 = "Vest_missing"
27 event_name_2 = "Helmet_missing"
28 event_name_3 = "Helmet_and_Vest_missing"
29 ;event_name_4 =
30 ;event_name_5 =
31 ;event_name_6 =
32 ;event_name_7 =
33 ;event_name_8 =
34 ;event_name_9 = |
35 ;event_name_10 =
36

```

iii. Active Guard (2)

- 3. Login to Active Guard via localhost:8092 or IP_ADDRESS:8092 (IP_ADDRESS is the IP of the machine hosting active guard server)
 - a. With **Administrator** username and password
- 4. Add VMS Server
- 5. Add Camera to Active Guard
 - a. Click on tick for camera > ensure **third-party icons** are there > enter username and password > click check > click register

(4) Add VMS server

(5) Add camera

The screenshot shows the 'i-PRO Active Guard configuration' interface. On the left, there are navigation icons. The main area is titled 'Enabled camera' and contains a table of registered cameras. A 'Camera Registration' dialog box is open in the foreground, showing a table of cameras to be registered and a 'Camera connection' form.

	IP address	Camera model	Camera name	Check result
<input type="checkbox"/>	192.168.0.30	WV-X1571LN	192.168.0.30 - Model...	
<input type="checkbox"/>	192.168.0.181	WV-X2571LN	192.168.0.181 - Mode...	
<input checked="" type="checkbox"/>	192.168.0.185	WV-X1571LN	192.168.0.185 - Mode...	

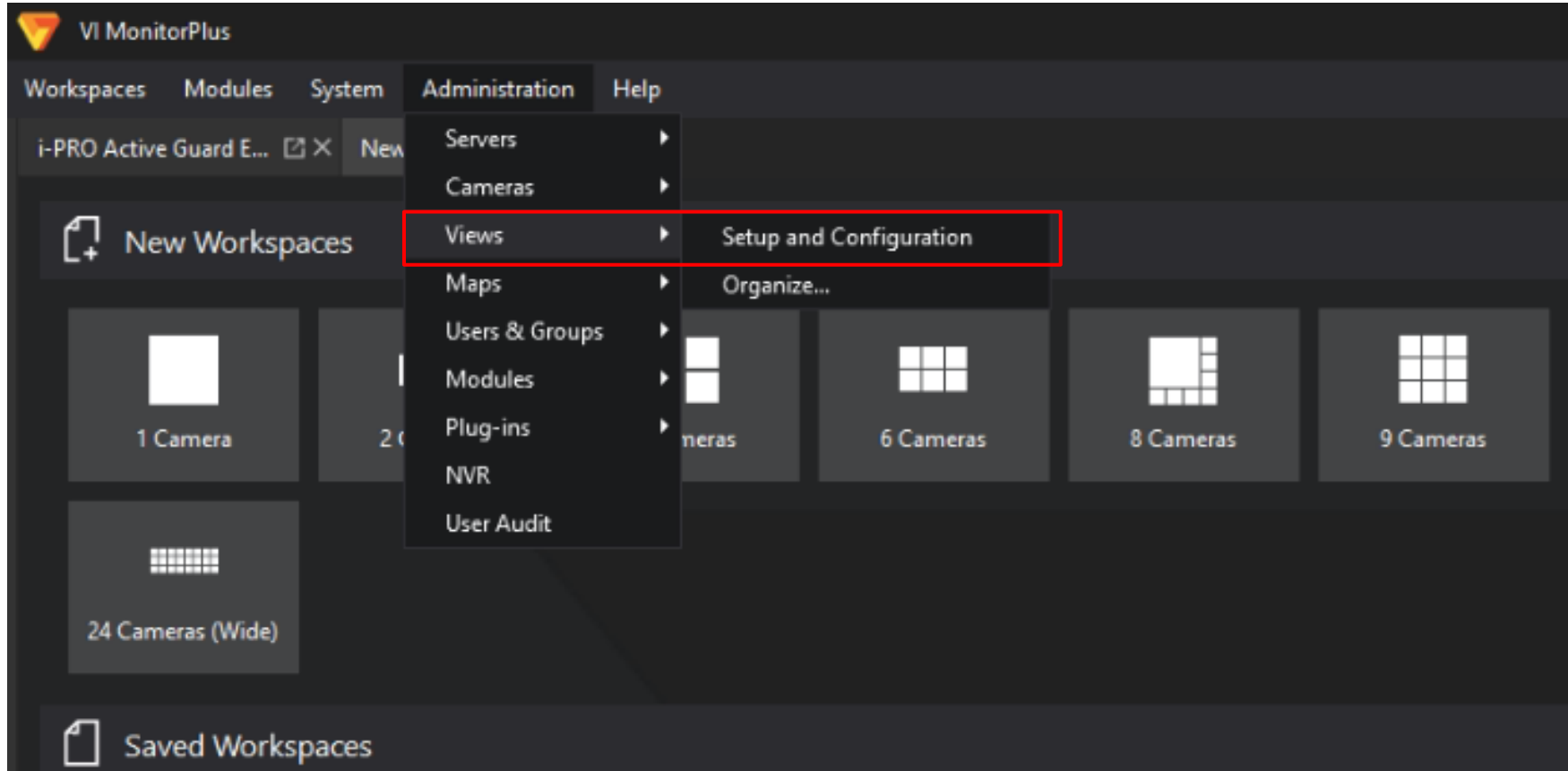
The 'Camera connection' form includes radio buttons for 'HTTP' (selected) and 'HTTPS', input fields for port numbers (80 and 443), and fields for 'User Name' and 'Password'. There are 'Check' and 'Register' buttons at the bottom.

If icons do not appear

1. Please check if previous step was done correctly
2. If extension software is installed in the camera

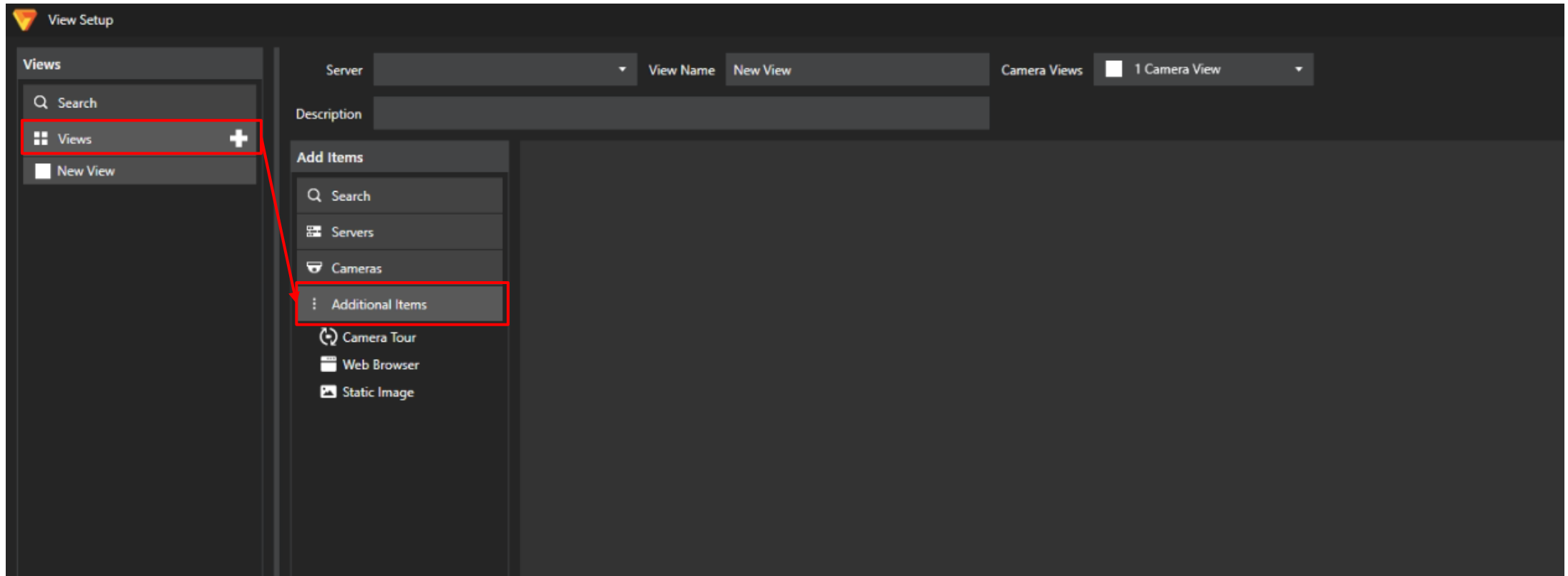
* Icon for third-party extension might be different

1. On VI Monitor Plus
 - a. Click Administration > Views > Setup and Configuration



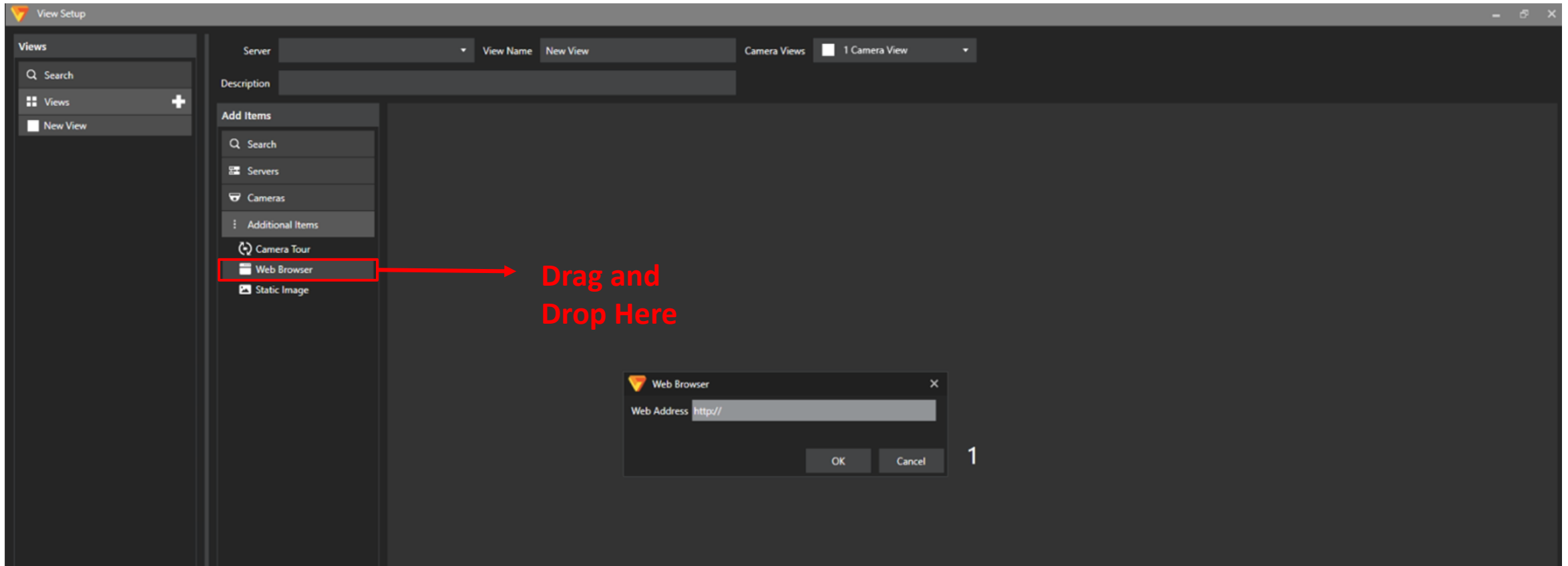
2. On VI Monitor Plus (View Setup)

- a. Click on plus icon (+) to create a new view
- b. Click on Additional Items

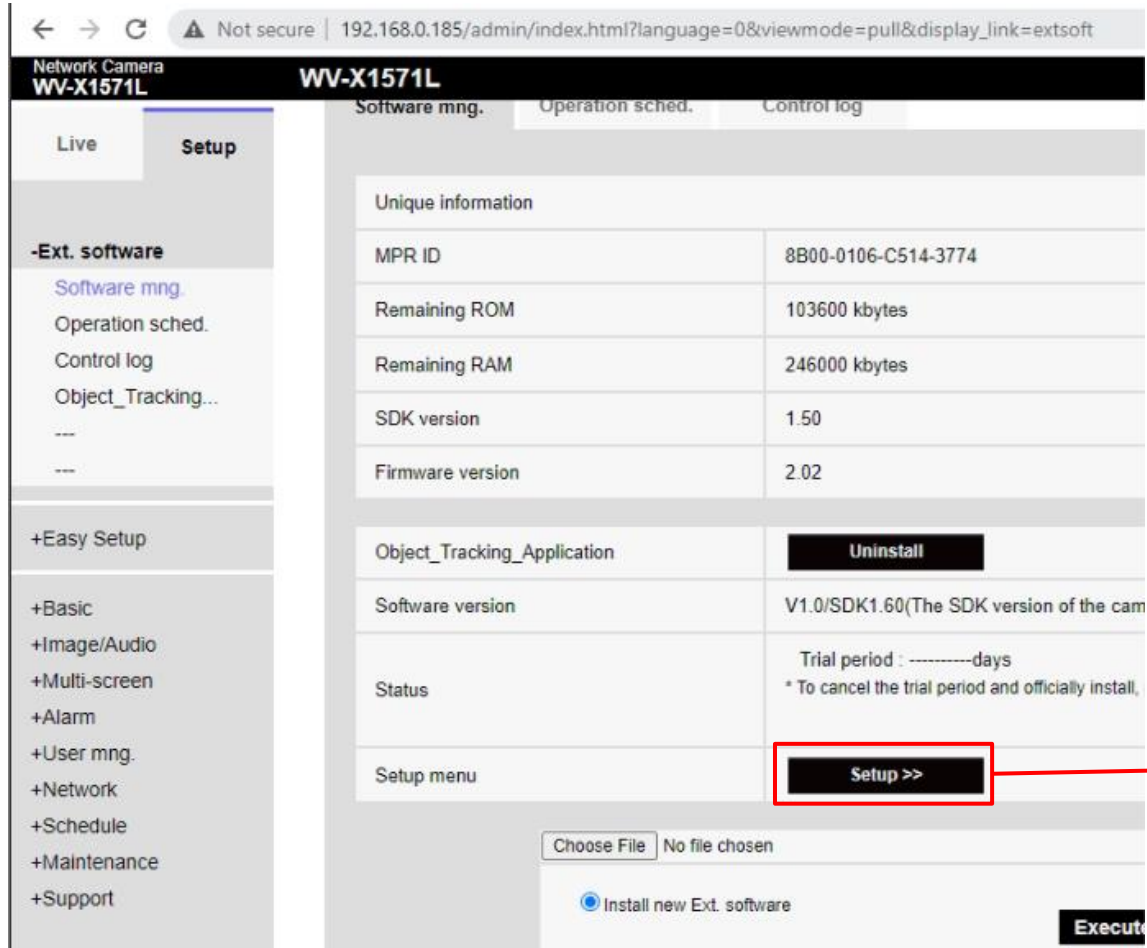


3. On VI Monitor Plus (View Setup)

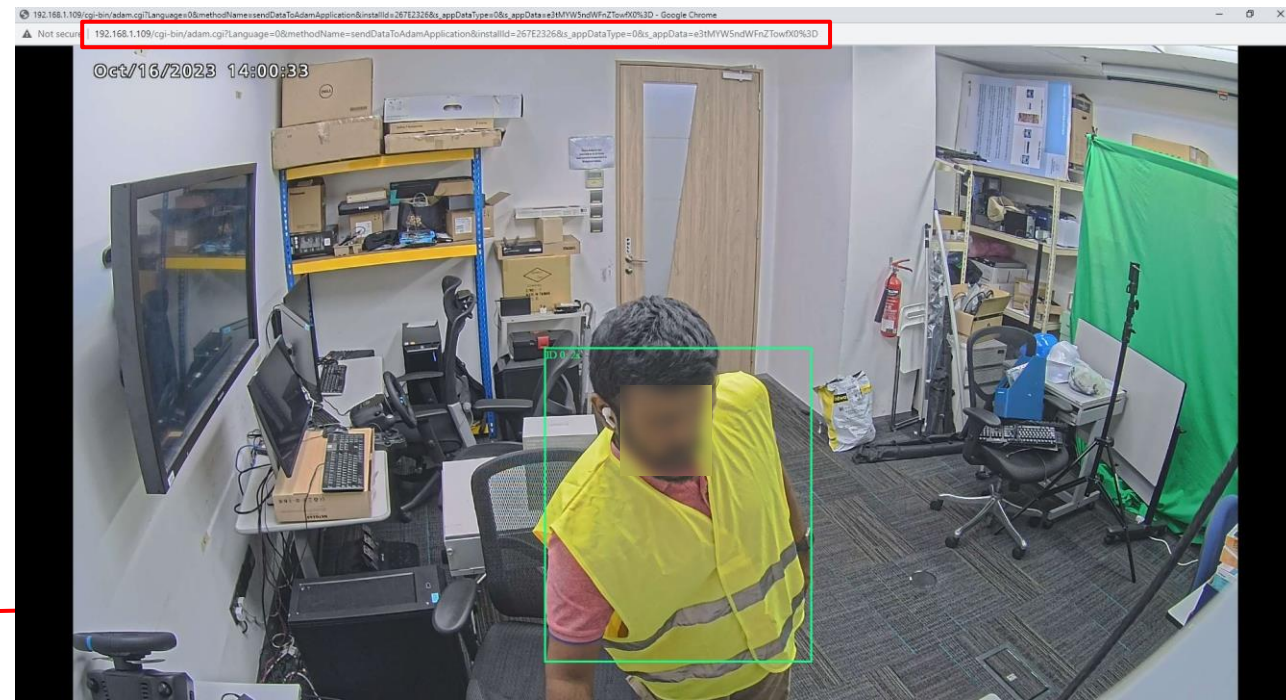
- a. Drag the Web Browser to the View
- b. Enter Web Address – Refer to next slide on attaining web address



- 4. On IPro Camera (Navigate to the extension software page)
 - a. Click on set up (This will pop up the web stream)
 - b. Copy the link of the web stream



Copy link and Close web stream



Note only **one web stream** may be open at a time

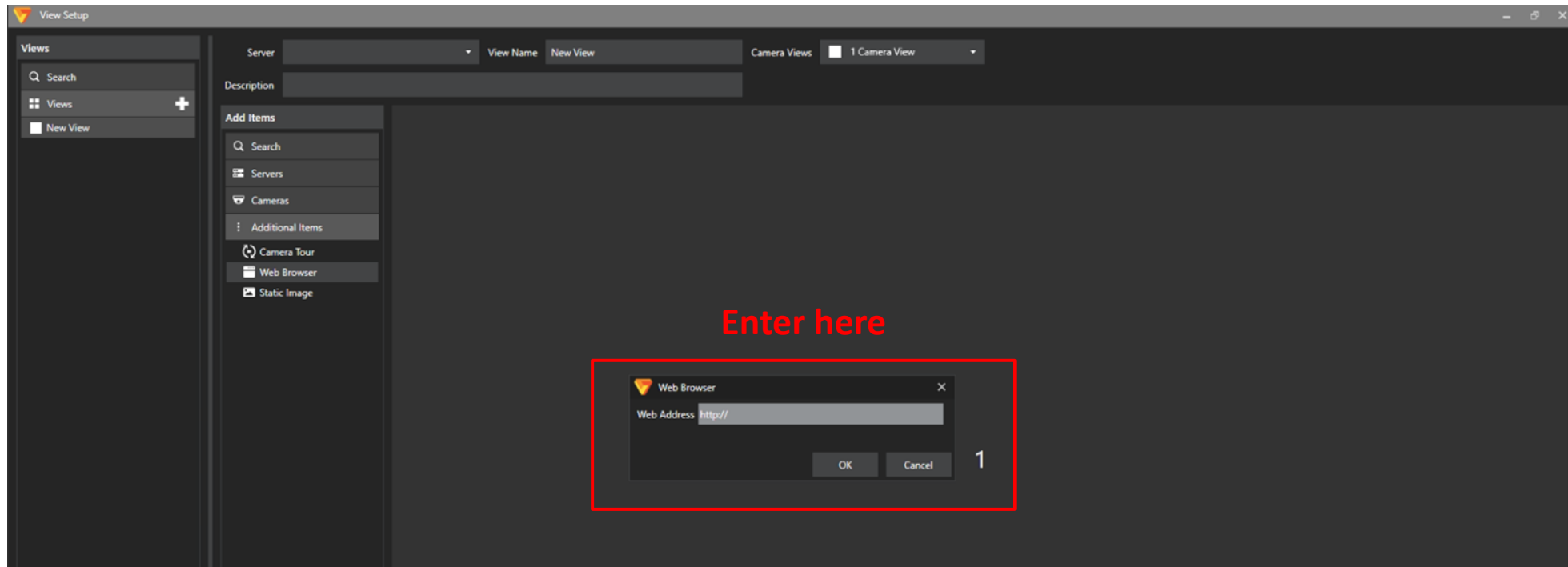
- E.g., if it is open on browser, you may not view it on VideoInsight. Please close all other browsers

5. On VI Monitor Plus (View Setup)

a. **Paste** the link in the Web Address

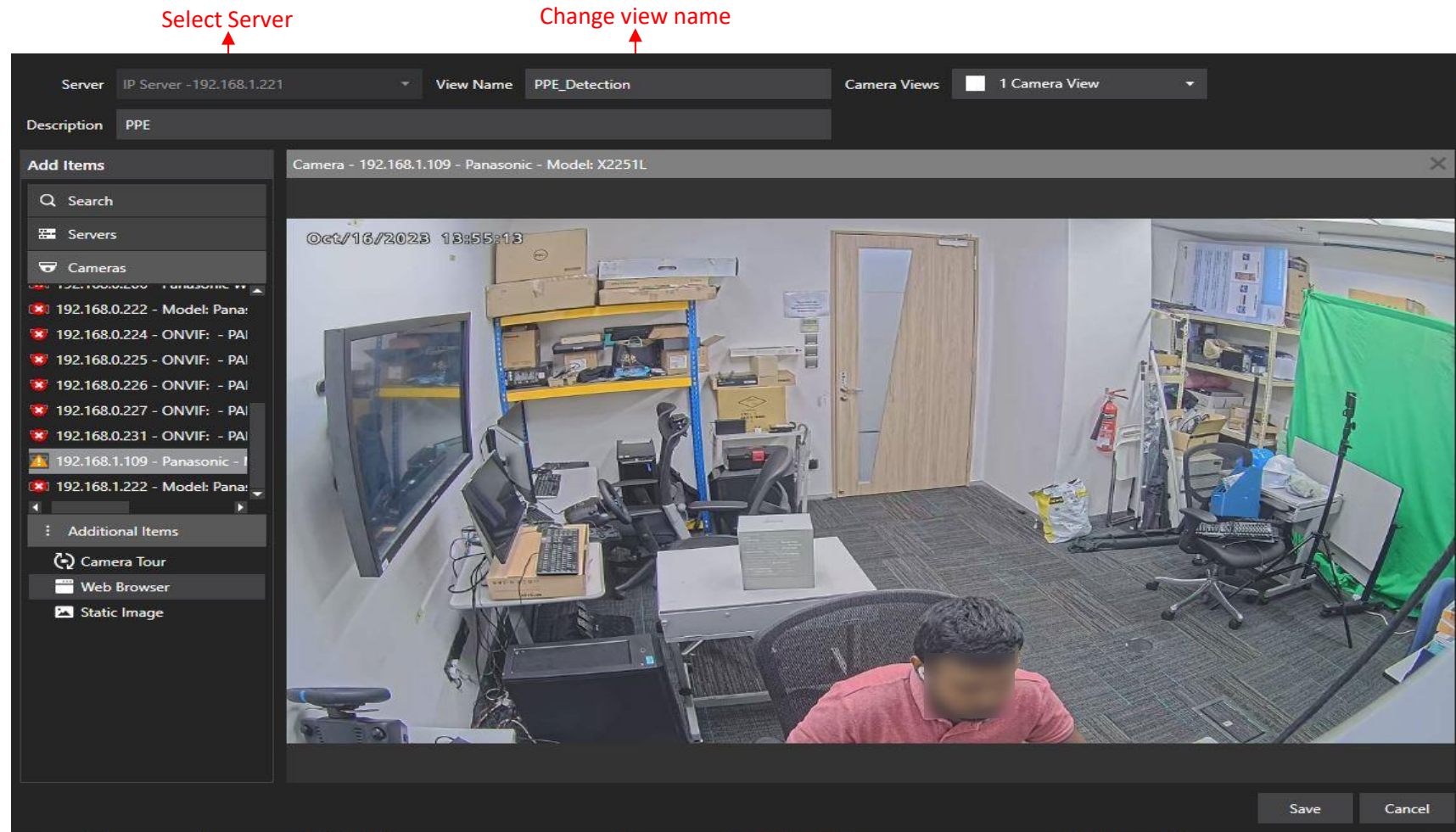
b. Add **username and password** in the link

- http://username:password@192.168.0.185/cgi-bin/adam.cgi?Language=0&methodName=sendDataToAdamApplication&installId=1B6880B1&s_appDataaType=0&s_appData=e3tMYW5ndWFnZTowfX0%3D



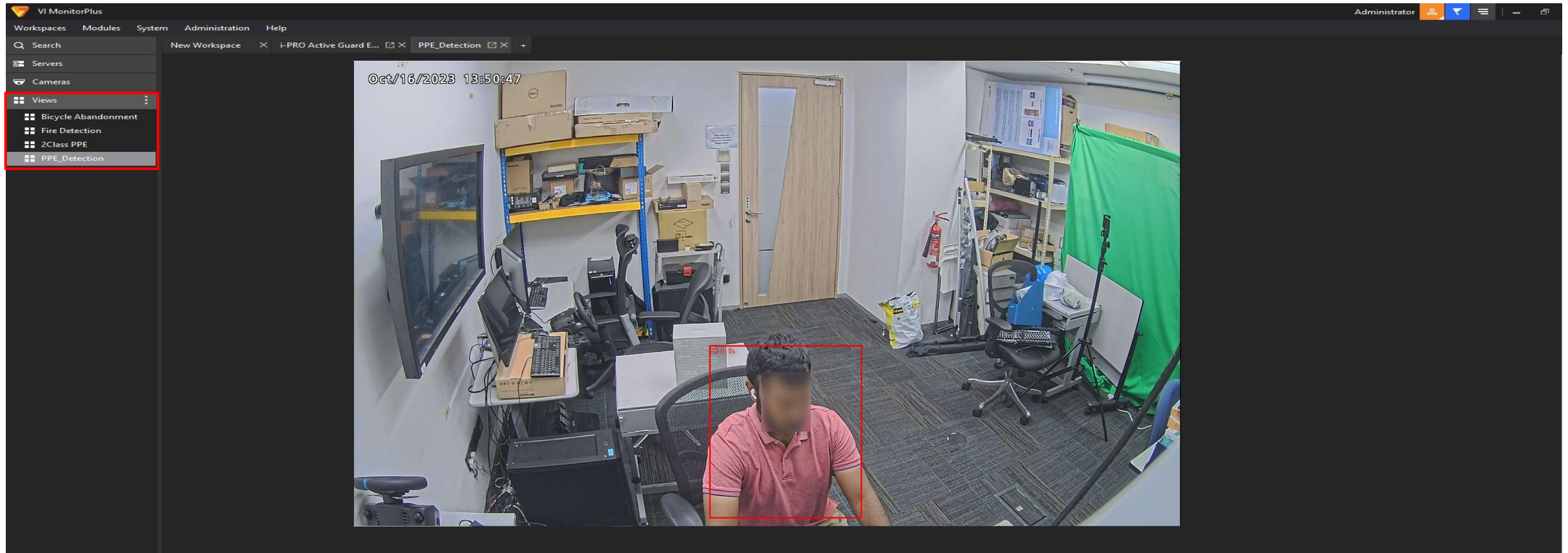
6. On VI Monitor Plus (View Setup)

- a. Select Server
- b. Change View name
- c. Save
- d. Close View Setup



7. On VI Monitor Plus

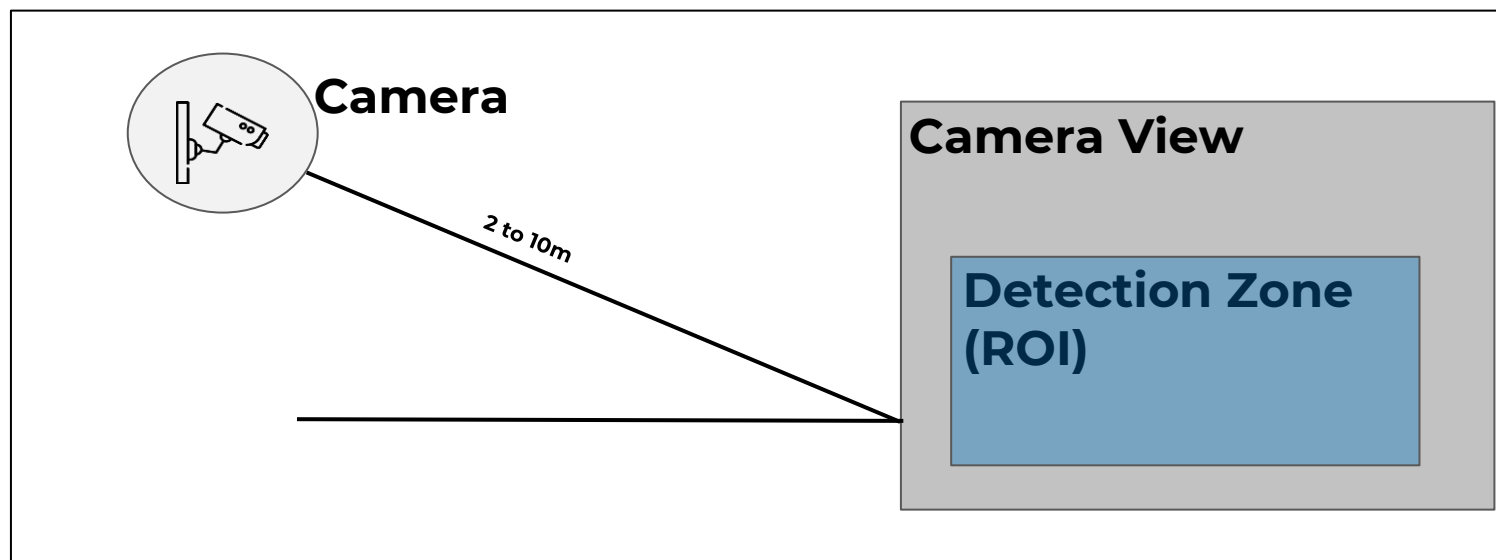
- a. Click Views > Any view (e.g., PPE_Detection)



5. Camera Installation

Optimal angle:

- The optimal distance for camera placement is 5 - 10m from the detection area.
 - Optimal view looks at the person from the front
 - Side/angled view of humans reduces accuracy of detection
 - **The use of ROI is recommended** to avoid false alert at the edge of the frame



Optimal view



Subpar view
Reduce accuracy

6. Application Configuration

Access Application Web Page

- Click on setup button in the application to activate the app and modify the settings

The screenshot displays the web interface for a Panasonic Network Camera (WV-X2571L). The browser address bar shows the URL: `192.168.1.109/admin/index.ntml?language=uc&viewmode=puil`. The page title is "Network Camera WV-X2571L".

The interface is divided into a left sidebar and a main content area. The sidebar contains several menu items, including "Live", "Setup", and "Ext. software". The "Setup" menu item is highlighted, and a red box is drawn around the "PPE_Detection_A..." application name in the sidebar. A blue arrow points from a text box to this red box.

The main content area shows the "Software mng." tab selected. It displays a table of unique information for the "PPE_Detection_App". The table includes the following data:

Unique information	
MPR ID	E900-0106-C510-CA43
Remaining ROM	103600 kbytes
Remaining RAM	246000 kbytes
SDK version	1.50
Firmware version	2.02

Below the table, there are several sections for the "PPE_Detection_App":

- A "Uninstall" button.
- Software version: V8.5/SDK1.70(The SDK version of the camera is out of date.)
- Status: Trial period : 78days. * To cancel the trial period and officially install, register the Registration Key of "AI Processor Activation Key".
- A "Setup >>" button, which is highlighted with a red box. A blue arrow points from a text box to this button.

At the bottom of the page, there is a section for "AI Processor Activation Key" with a "Set" button.

Two text boxes with blue borders and arrows provide instructions:

- A box on the left says "click on the Application name to open the UI page", with an arrow pointing to the "PPE_Detection_A..." application name in the sidebar.
- A box on the right says "Access application web page", with an arrow pointing to the "Setup >>" button.

- For first time setup, user will be auto-directed to License Registration page
- A valid license key is required. Please contact PRDCSG at the following email to obtain the license: **Inquiry-AI@sg.panasonic.com**
- Once activated, click on **Back** button to return to the main page
- License page can be accessed from the main page using the **About** button

License Registration

Invalid license key or product has expired, please try again.
Your camera's MAC address is **08:00:03:10:2A:40**
Contact us at **Inquiry-AI@sg.panasonic.com** along with camera's MAC address to receive

Enter your license key here

Verify

Back

Enter valid license key followed by **Verify** button to activate the app

License Registration

Product activated.

Enter your license key here

Verify

Back

Return to main page

Main App UI

Click to modify the settings

Settings

License information

About



Main Display/ UI output

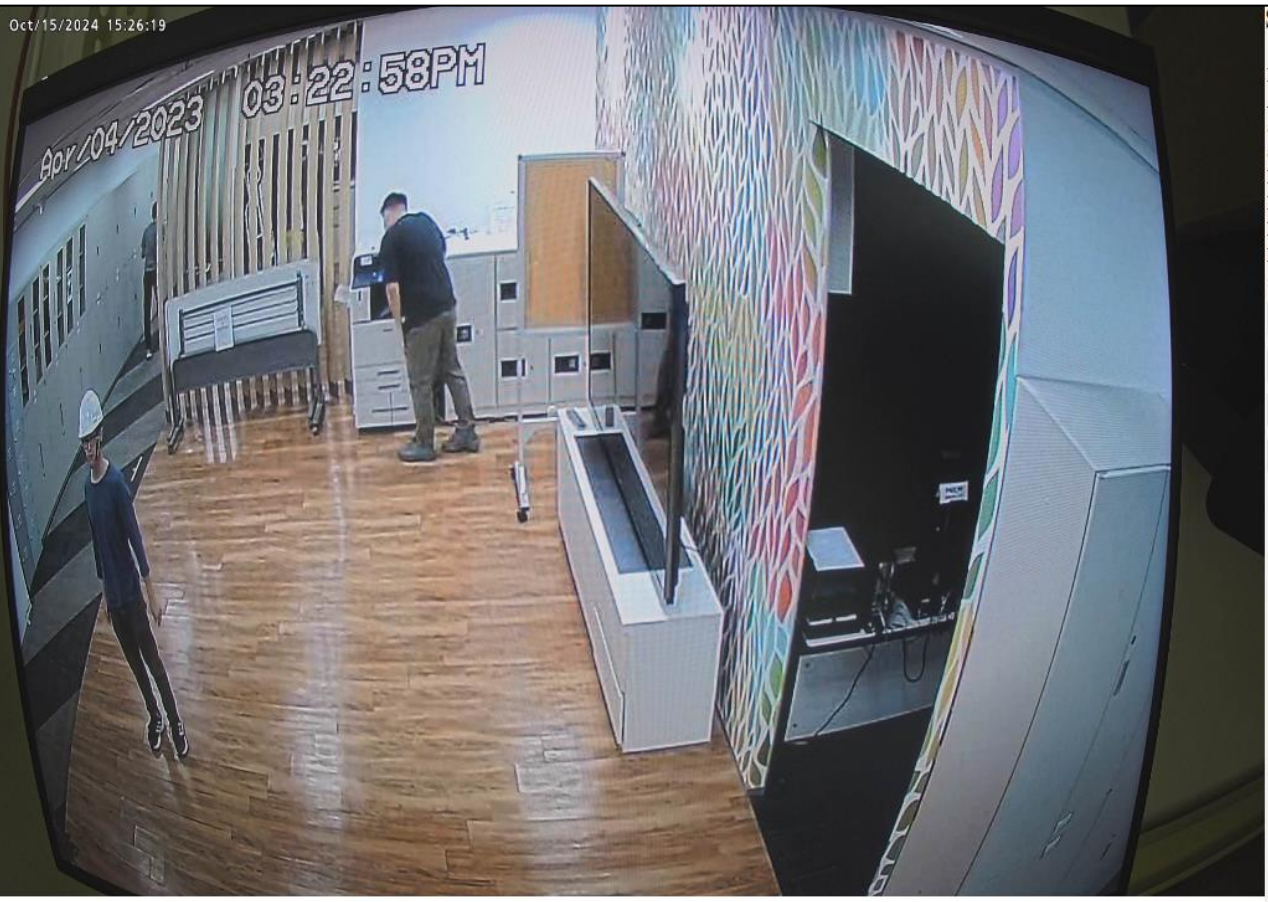
In settings page, you can modify the following parameters

(1) Application parameters like confidence threshold, time before sending alerts

(2) Alert selection Helmet/ Safety Vest

(3) Setup MASK region for enabling detection

After every change press "Apply Edit"



Parameter	Value
Detection Confidence	30
Alert Time Delay (s)	3
alert_vest	<input checked="" type="checkbox"/>
alert_helmet	<input checked="" type="checkbox"/>
ROI XMin	0
ROI XMax	1920
ROI YMin	0
ROI YMax	1080
set_mask_area	<input type="checkbox"/>

Clear Mask

Apply Edit

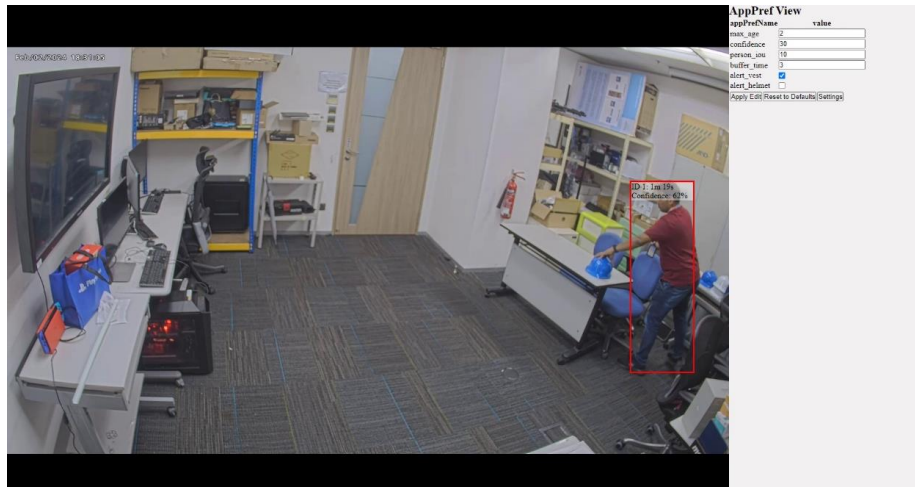
Reset to Defaults

Back

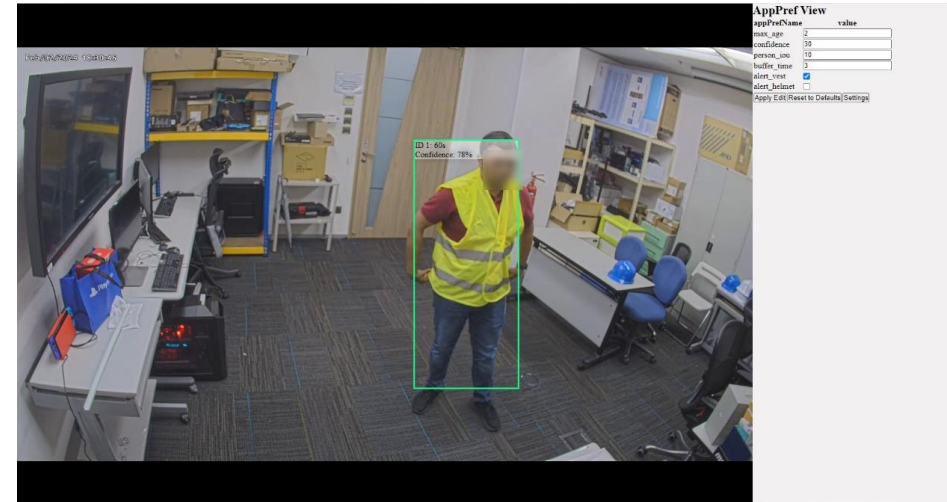
Settings Page

Parameter	Value
Detection Confidence	<input type="text" value="30"/>
Alert Time Delay (s)	<input type="text" value="3"/>
alert_vest	<input checked="" type="checkbox"/>
alert_helmet	<input checked="" type="checkbox"/>
ROI XMin	<input type="text" value="0"/>
ROI XMax	<input type="text" value="1920"/>
ROI YMin	<input type="text" value="0"/>
ROI YMax	<input type="text" value="1080"/>
set_mask_area	<input type="checkbox"/>

- Select the type of Alert from checkbox
- Click “Apply Edit” to save the changes
- User can select any of the following options for Alerts, based on combination of checkboxes
 1. Only Vest
 2. Only Helmet
 3. Both Vest & Helmet
 4. None



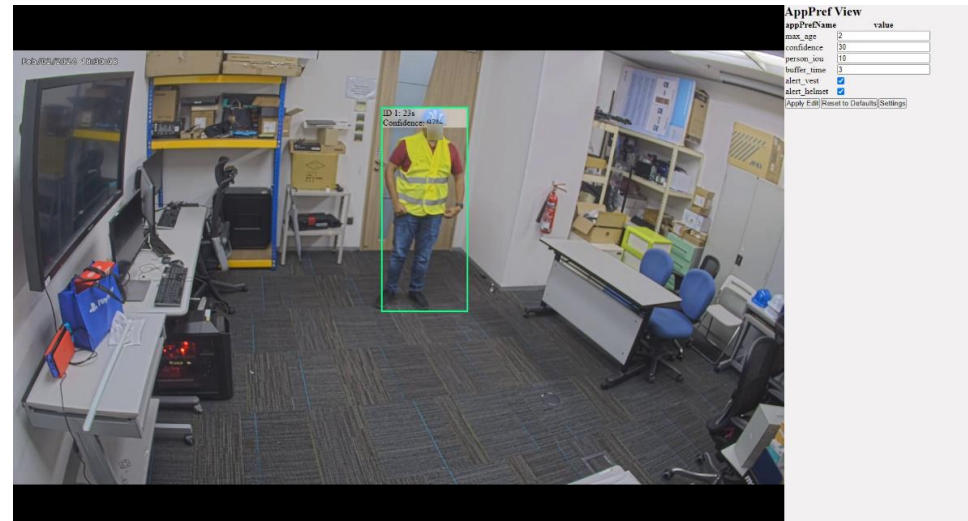
No Vest detected (Alert)



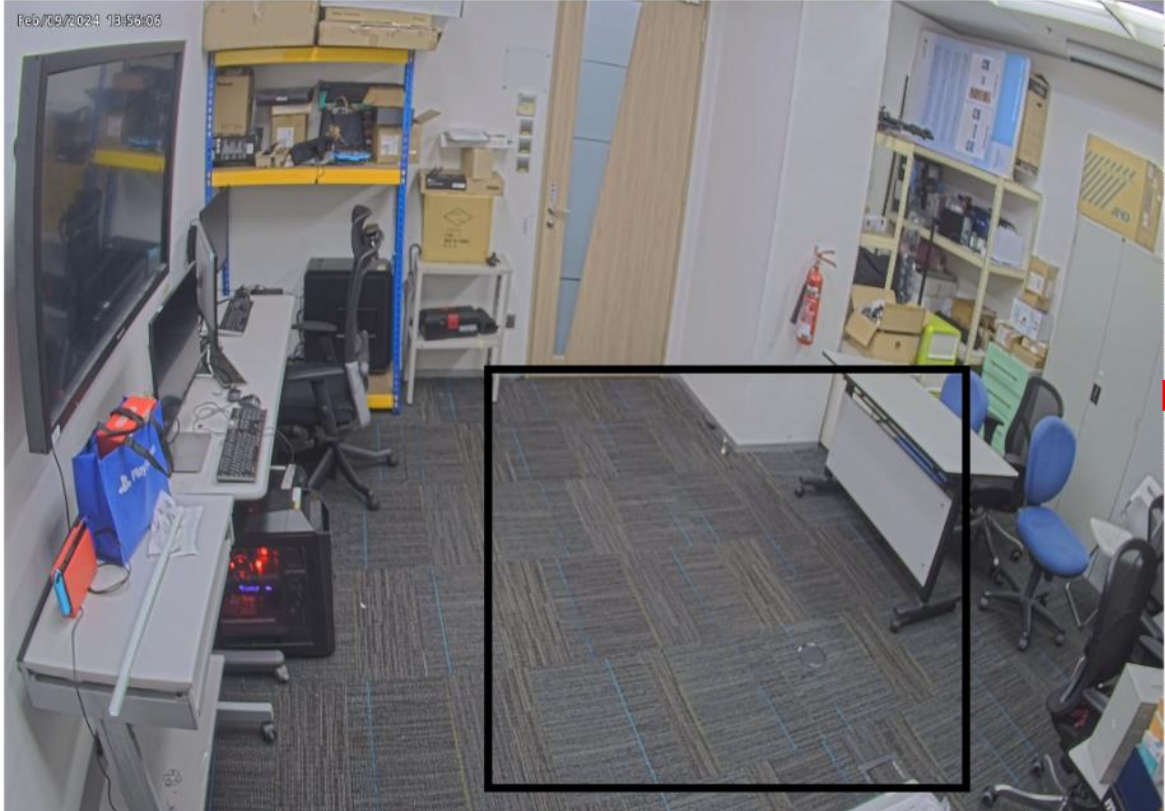
Only detect Safety Vest

Notes:

- Please set the suitable alert types (vest and/or helmet) accordingly to avoid excessive alerts being sent, which might result in the app crashing



Both Safety Vest and helmet



Feb/09/2024 18:55:03

AppPref View

appPrefName	value
max_age	2
confidence	30
person_iou	10
buffer_time	3
alert_vest	<input type="checkbox"/>
alert_helmet	<input type="checkbox"/>
ROI XMin	0
ROI XMax	1920
ROI YMin	0
ROI YMax	1080
set_mask_area	<input checked="" type="checkbox"/>

Clear Mask
Apply Edit
Reset to Defaults
Back

User can set ROI mask to detect only within the ROI

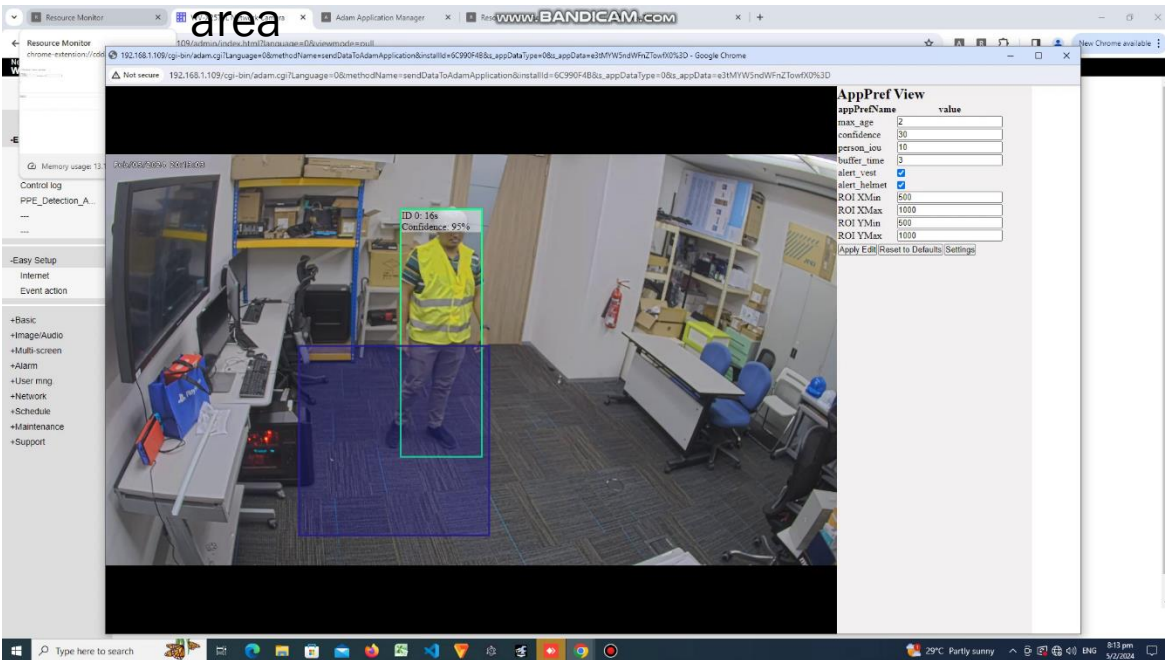
1. Check on set_mask_area
2. Draw the desired ROI, value of ROI coordinate will change accordingly
3. Click apply edit, the following message will show

192.168.1.109 says

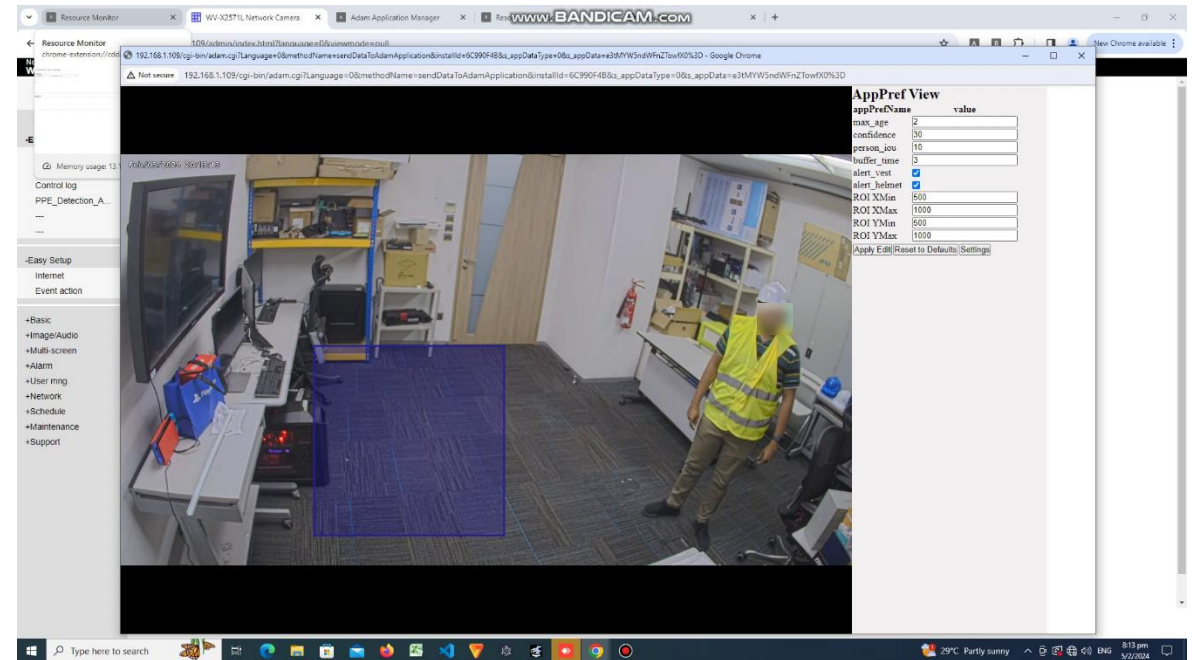
Settings & Parameters are updated Successfully!

OK

1) Detection **ACTIVE** within MASK

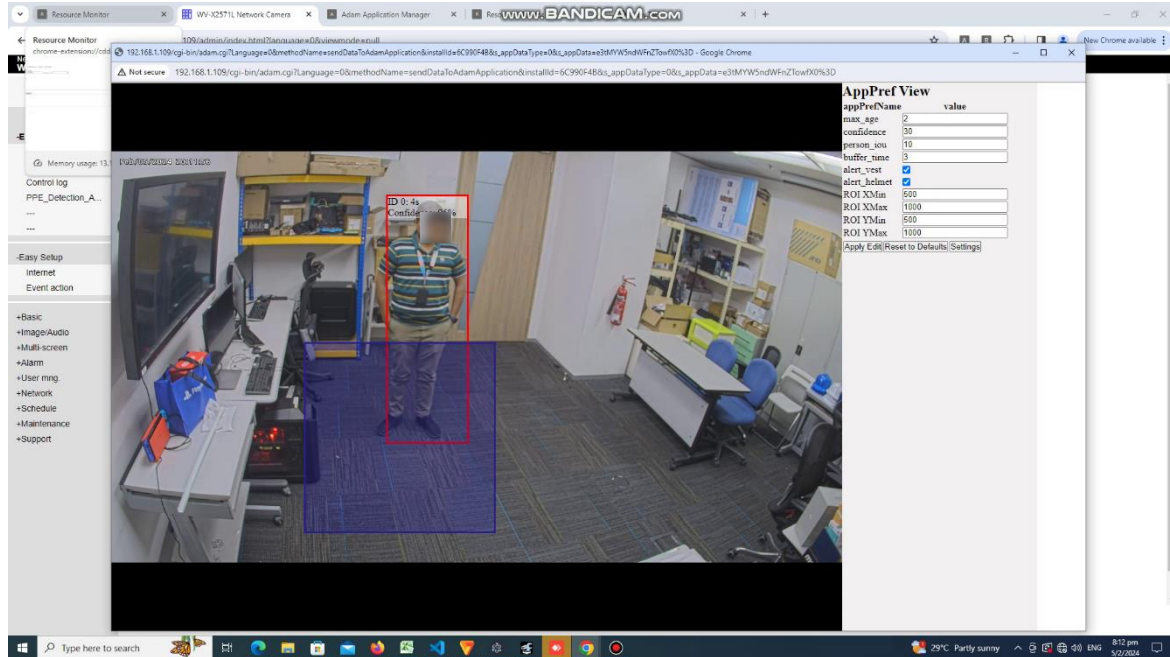


2) NO Detection outside MASK area

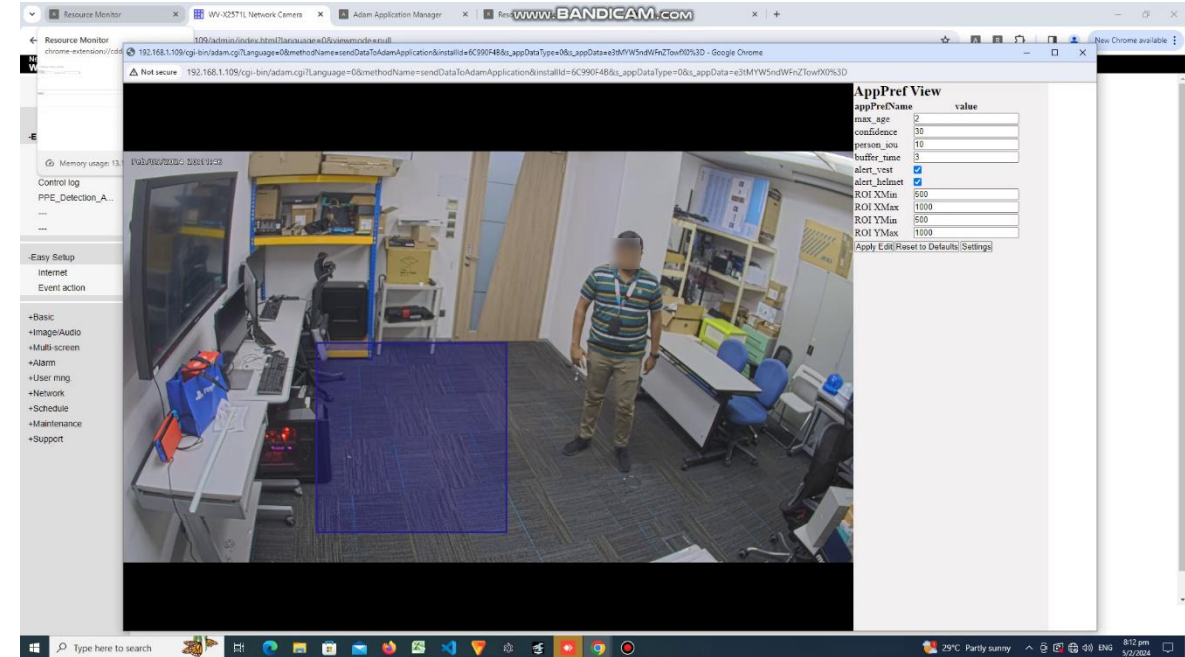


- MASK region is selected manually from earlier
- It is indicated by a “blue” color mask on the GUI

1) Detection within MASK area



2) NO Detection outside MASK area



- MASK region is selected manually
- It is indicated by a “blue” color mask on the GUI

Reset to default

40

192.168.1.109/cgi-bin/adam.cgi?Language=0&methodName=sendDataToAdamApplication&installId=51D88C8F&s_appDataType=0&s_appData=e3tMYW5ndWFnZTowfX0%3D - Google Chrome

Not secure 192.168.1.109/cgi-bin/adam.cgi?Language=0&methodName=sendDataToAdamApplication&installId=51D88C8F&s_appDataType=0&s_appData=e3tMYW5ndWFnZTowfX0%3D

Feb/09/2024 13:47:33

192.168.1.109 says
Values are RESET to default!

OK

AppPref View

appPrefName	value
max_age	2
confidence	30
person_iou	10
buffer_time	3
alert_vest	<input checked="" type="checkbox"/>
alert_helmet	<input checked="" type="checkbox"/>
ROI XMin	0
ROI XMax	1920
ROI YMin	0
ROI YMax	1080
set_mask_area	<input type="checkbox"/>

Clear Mask

Apply Edit

Reset to Defaults

Back

Click **Reset to defaults** button will reset all settings

7. Points of attention

Factors that affect accuracy

The environmental factors below can affect the detection accuracy.

Lighting conditions

- The difference in brightness between the background and the moving object is small
- Luminance level of image is too low (During nighttime, etc.)
- The luminance level of the shooting area is subject to change (outdoors, by the window, etc.)
- Outside light such as sunlight and headlight enters the shooting area.
- Fluorescent light is flickering
- Reflected light from a puddle or glass come into the shooting area

Environmental conditions

- The camera is shaking
- The weather is extremely bad
- The dome of the camera is sweating or has dirt on it
- Flags or vinyl and so forth are fluttering in the wind

Subject conditions

- The object is moving too fast or too slow
- The object is too small or too large
- The object is moving straight toward the camera
- There are too many moving objects in the shooting area
- Shadows interfere in the detection area.

Appendix

Version History

Version History

No	Update contents	Page No.	Version	Update
-				
1	1 st Version		1.0	16.Oct.2023
2	2 nd version with updated URLs		1.1	17.Oct.2023
3	3 rd version with updated UI and configuration page		1.3	09.Feb.2023
4	New software version with updated AI model. Reliable detection results with stable app performance		2.1	07.Oct.2024
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