
WEST VISAYAS STATE UNIVERSITY
1902
ILOILO CITY
COLLEGE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
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WVSU

USER MANUAL

ANOMALOUS DETECTION SYSTEM

USER MANUAL

Contact us at our Email

Adolacion, Jesmar Troy
jesmartroy.adolacion@wvsu.edu.ph

Leagogo, Nezel
nezel.leagogo@wvsu.edu.ph

Millares, Francine Anne
francineanne.millares@wvsu.edu.ph

Soldevilla, Francis Rey
francisrey.soldevilla@wvsu.edu.ph

PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATING THE SYSTEM

RETAIN FOR FUTURE REFERENCE

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Notice

This manual provides installation information for indoor Wired/Wireless CCT camera. To work with this device, any installer or technician must have the following minimum qualifications:

- A basic knowledge of CCTV systems and components
- A basic knowledge of electrical wiring and low-voltage electrical hookups.
- Have read the manual completely

Copyright

What is a CCTV Camera?

- CCTV stands for closed-circuit television and is commonly known as video surveillance. "Closed-circuit" means broadcasts are usually transmitted to a limited (closed) number of monitors, unlike "regular" TV, which is broadcast to the public at large.

How does a CCTV Camera Work?

- CCTV works by the camera or cameras taking a constant sequence of images that are then transmitted by cable or wirelessly (depending on the chosen system type) to the recording device and then on to the display monitor, which enables an individual to see the sequence of images as video footage.

How are CCTV Cameras Different from IP Cameras?

- CCTV systems convert the video signal to a format that can be used by televisions, VCR's, or DVR's. IP cameras convert the video signal into IP packets to be transmitted over the data network or internet to a network storage device such as a server, NAS, or by storing on board the camera. CCTV are reliable, relatively inexpensive, and easy to install.

What Components Will I need for This System?

- For this Anomalous Surveillance System, you'll need a Wired/Wireless CCTV camera, and a Monitor to view the feedback from the installed cameras. Accessories are optional, but since some cameras have built-in microphones and speakers, you can still choose whatever accessories you can add to your surveillance system.

How many cameras do I need?

- This system can only make use of one camera at the moment. For future modification, maybe it can make use of multiple cameras.

Can I use my existing cameras?

- Yes, you can use your existing CCTV cameras. The system will automatically detect the camera that you have plugged.

What is the warranty on a surveillance system?

- Most cameras have a warrant of 2 years

7. TROUBLESHOOTING

If you have problems with the system, there is often a quick and simple solution. Please try the following.

Problem	Solution
No picture from a camera	1. Check all connections to the camera. Make sure the adapter is plugged in correctly. 2. Make sure that the camera is in range of the receiver.
The picture is dropping	1. Move the camera closer to the receiver 2. Try repositioning the camera, receiver or both to improve reception.
Audio Problems	1. Increase the volume when there is no sound. 2. Make sure that there is sound within range of the camera microphone. 3. If the unit emits loud screeching noise (audio feedback), move the camera or receiver farther apart.
Choppy Picture	Lower frame rate is the usual cause for a choppy picture (i.e. 10 frames per second vs 20 frames per second). Try moving the camera closer to the receiver or remove any obstructions that may be causing interference.

8. FAQ (Frequently Asked Questions)

Why do I need an Anomalous Surveillance System?

- Since this system is made to provide real-time surveillance, specifically to detect anomalous behaviors such as falling, violence, monitoring drowsiness, or detecting deadly weapon, it can help reduce risk by responding immediately to accidents.

TABLE OF CONTENTS

Overview of Components

Wired CCTV Camera (Optional)

Wireless CCTV Camera (Optional)

LCD Monitor Display

Operating Temperature	-20°C ~ +60°C	
	Wired Camera	Wireless Camera
Dimensions (W*H*D)	95mm x 140mm	80mm x 100mm
Weight	327g	297g

Environmental	Operating Temperature	0°C ~+ 50°C
	Operating Humidity	10%~90%
	Atmosphere Pressure	86kpa ~ 106jps
	Dimensions	183mm x 136mm x 30mm
	Weight	470g

Camera

	Item	**Parameter**
System	Image Sensor Type	1/4” color CMOS image sensor
	Effective Pixel	1280 x 720
	Lens	f=3.6mm
	IR LED	24pcs, Ø5mm
	AGC	Auto
	Electronic Shutter	1/60 ~ 1/15,000 sec
	White Balance	Auto
	TX Power	17dbm @ room temperature
Environmental	Environmental Rating	IP65
	Power Supply	DC5V/1A
	Power Consumption	3W max

SAFETY INSTRUCTION

The devices have been manufactured by their designated manufacturers in accordance with international safety standards. Please read enclosed safety information and installation guide fully before proceeding and retain for future use.

1. Unpack all components carefully and check box contents. If any item is missing, please return the product in its original packaging to your retailer.
2. Install in accordance to manufacturer’s instructions.
3. Use only attachments and accessories specified by the manufacturer.
4. Do not install next to a water source, any heat source, in direct sunlight and do not block any ventilation openings. As this is a wireless device communicating over Wi Fi network, please avoid installing near fridges, microwaves and cookers, as electrical interference may occur.
5. Ensure products are fixed to a suitable, stable surface to prevent accidental falls and damage to the products.
6. Products are fitted with ventilation openings to the rear, which should not be covered at any time. This product should not be fitted in a built in installation unless proper ventilation is provided (min. 10 cm).
7. Safeguard the power cord by observing the following information:
   - Do not modify or manipulate the power cable or plug.
   - Do not allow anything to rest on the power cord and do not position where there is a risk of the cable being stepped on.
   - Ensure the mains cable is positioned away from any heating equipment, damp or moisture.
8. Only operate this device using the appropriate power source as detailed on the back of the product. If you are unsure, please contact your electrician. Disconnect the device from the power supply before carrying out maintenance or installation.
9. Never open the housing or power supply unit. Do not insert any object into the product, as this could lead to an electric shock.
10. If any of the following occur, unplug this product from the wall and contact manufacturer:
    - Power cord or plug is damaged.
    - Liquid has been spilled into the product.
    - Product does not operate normally, when the operating instructions have been followed.
    - Product has been dropped or damaged.
11. Unplug the product from the wall before cleaning. Carefully clean surface with a soft, damp cloth, taking care not to scratch the surface finish. Do not use any liquid or aerosol cleaners.

Explanation of Symbols

	The triangular high voltage symbol is used to warn of the risk of injury or health hazards (e.g. caused by electric shock).
	The triangular warning symbol indicates important notes in these operating instructions which must be observed.
	This symbol indicates special tips and notes on the operation of the unit.

Important Information

	All guarantee claims are invalid in the event of damage caused by non-compliance with this user guide. Manufacturers cannot be held liable for resulting damages.
	In the event of material or personal damage caused by improper operation or non-compliance with the safety information, manufacturers cannot be held liable. All guarantee claims are void in such cases.

CAUTIONS

KEEP IN WELL VENTILATED PLACE

Ventilation holes are provided on the cabinet to prevent the temperature from rising. Do not cover the unit or place anything on the top of the unit.

AVOID HEAT

Avoid placing the unit in direct sunshine or near a heating appliance.

TO ELIMATE EYE FATIGUE

Do not use the unit against a bright background and where the sunlight or other light sources will shine directly on the monitor.

BE CAREFUL ON HEAVY OBJECTS

Neither the monitor itself nor any other heavy object should rest on the power cord. Damage to a power cord can cause fire or electrical shock.

5.3 Specifications

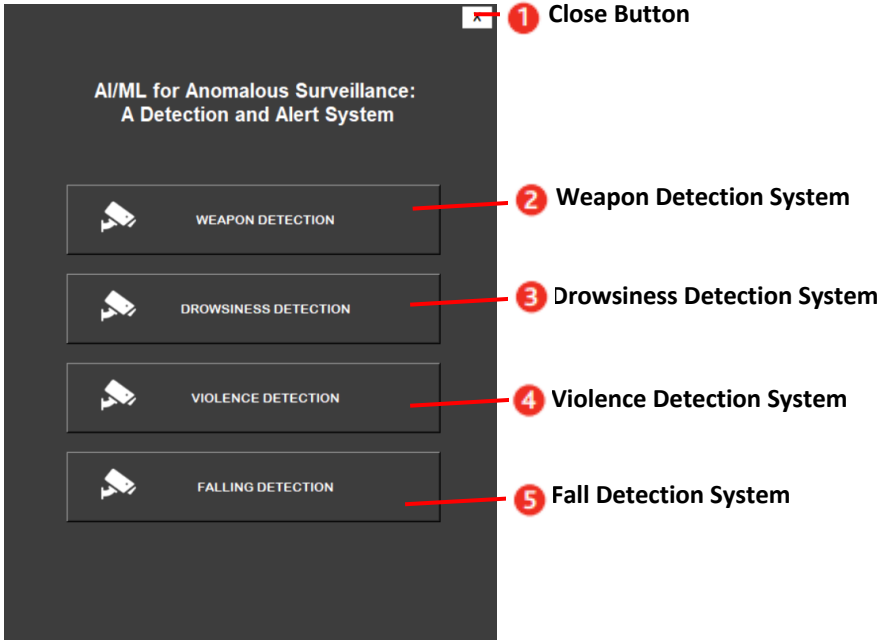
Monitor and Device (PC/Laptop)

Item		**Parameter**
System	Windows Version	Windows 10
	Display Screen	7”TFT LCD (16:9)
	Resolution	800(H) X RGB X 480(V)
	Video Standard	PAL / NTSC
Wireless Video & Audio Input	Frequency Range	2.400GHz ~ 2.483GHz
	Receiving Range	Up to 200m line of sight
	Receiving Sensitivity	-89dBm 4M mode Dev=1MHz
AV Output	Video Output	1ch CVBS 1.0Vp-p, impendance 75Ω
	Audio Output	No
Framerate	Local	Real time encoder typically at VGA 30FPS @64MHz, HD 20FPS @96MHz
	PC Playback	30FPS @ VGA, 30FPS @ HD 720p
Connector	Mini USB	Used for software update (for manufacturer use only)
	Power Supply	64GB max.
	Power Consumption	DC12V/1.25A

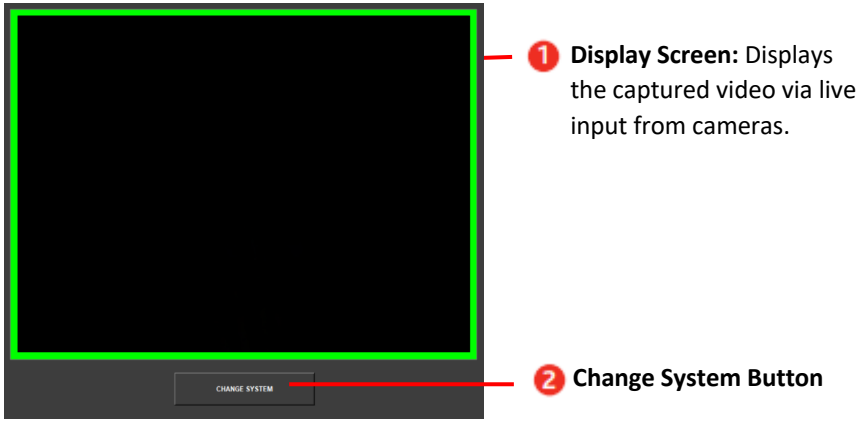
Usage and System Interface

The system will automatically connect with the available cameras installed in a room where it has been installed. The following is the components of the system.

5.1 Home Screen Interface



5.2 Detection Screen Interface



1. INTRODUCTION

Thank you for using our Anomalous Detection System. Your new wired/wireless security system has been designed for ease of installation and incorporation of range features to monitor your elderlies at home in events such as falling accidents, violence, sight of dangerous weapons, and drowsiness.

1.1 System Requirements

System Requirements

Components	Required
Operating System	Windows 10
Virtual Machine	Anomaly Detection can run in a virtual environment, provided that the CPU and memory resources for your instance are reserved.
Integrated Development Environment (IDE)	Visual Studio Code version 1.66.1, or later or latest versions
CPU and Memory	4 Core or 8 Core and a 64 GB memory server.
Available disk space	16 GB
Prerequisites	Visual Studio version 2019 or 2022

1.2 Features of Required Components

LCD MONITOR

- MPEG4 compression, support VGA and HD with two kinds of resolution
- Support SDHC up to 64GB
- Multiple recording modes
- Up to 200m wireless transmission range
- Supports 4 channel auto switching
- Supports 2 split/ 4 quad image view
- Interference free, secure and private signal camera
- VGA resolution: 640x480, HD resolution: 1280x720
- Network

CAMERA

- 1.3 Mega pixels
- IR LED for night vision
- With automatic IR cut
- Built-in microphone

2. COMPONENTS CONTENT

Wireless CCTV Camera (Optional)

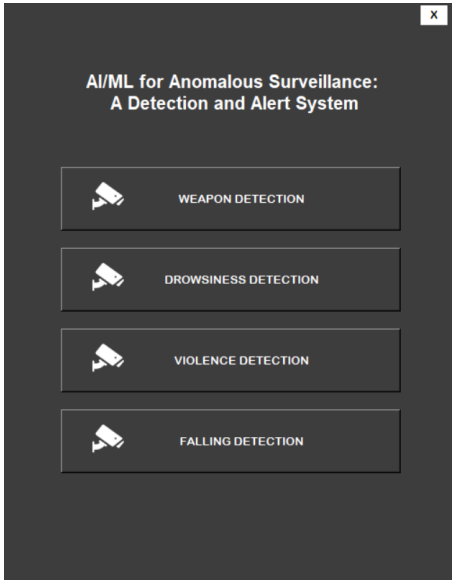
Wired CCV Camera (Optional)

LCD Monitor

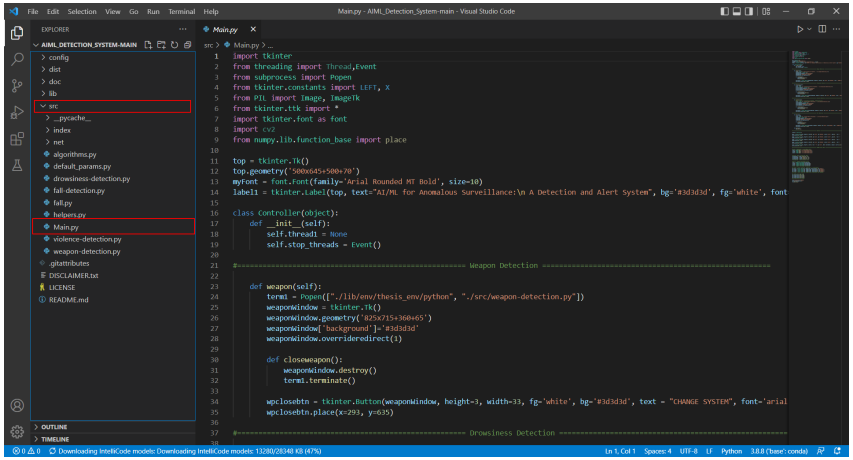
3. GETTING TO KNOW YOUR DEVICE

3.1 Camera Overview

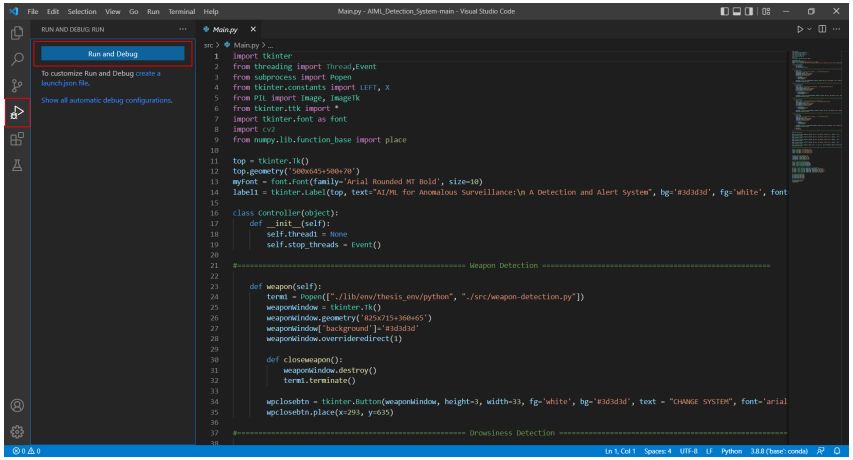
After running, a screen will pop up on your screen (see reference below) and this will be the main GUI of our system. From here, you can choose whatever anomaly detection system you want to use, from **Weapon Detection**, **Drowsiness Detection**, **Violence Detection**, and **Falling Detection**.



After opening the folder, a menu will pop up on the left side of your IDE, navigate to the **src** folder and select the **Main.py** in the selection, the IDE will automatically show the contents of that python file on the terminal on the right.

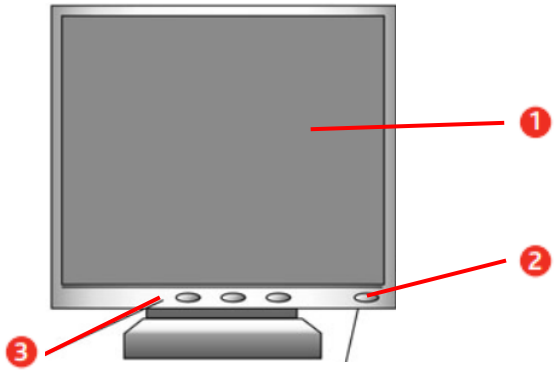


To run the system, navigate to the button displayed on the left side corner of the screen (see reference below), and click **Run and Debug** to run the system. In any cases the IDE will prompt you to select a **Debug Configuration**, if this happens, just simply select the **Python File** option.



1. Camera Antenna: Sends and receives signal from receiver.
2. Lens
3. IR LEDS: Light up the filmed area.
4. Bracket: To mount camera on to a wall or other surface.
5. Pairing Button
6. Microphone: Transmit voice into digital signal.
7. DC Connection

3.2 LCD Monitor Overview



1. LCD Screen: Displays captured images from cameras.
2. Power Button
3. Tweak Buttons: Menu buttons that allows tweaks on the monitor's display.

4. SETTING UP YOUR DEVICE

4.1 Introduction

Careful consideration should be taken when deciding the best place to install the cameras and recording devices. Please read safety instructions on page 1 before proceeding with installation, the below tips may also offer some guidance.

4.2 Camera Positioning

Please take the following factors into consideration when installing cameras.

Distance from the camera to the Monitor

Ensure that the wireless camera is within the wireless range, or the wire is long enough to connect with the LCD monitor

Lighting Conditions

Ensure that cameras have adequate lighting to record the target area. For the best results do not point the camera towards a light source. It is recommended to clean the camera lens periodically to ensure picture quality is consistent

Environmental Conditions

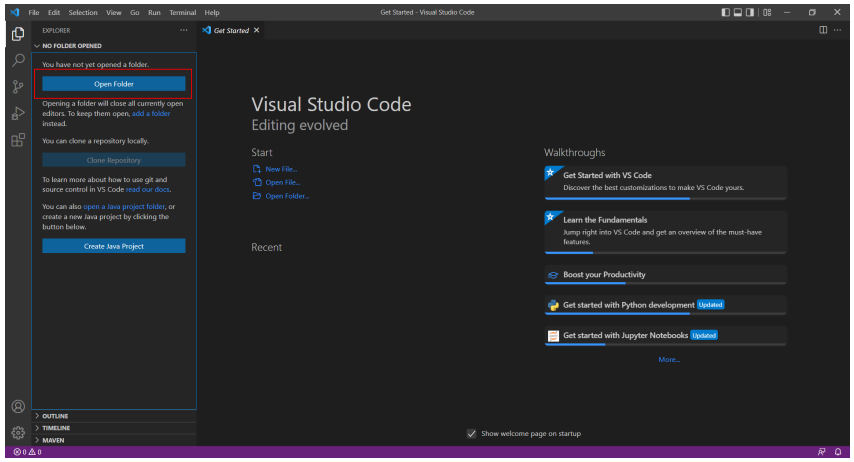
Ensure the cameras aren't subject to any excessive heat

Target Area

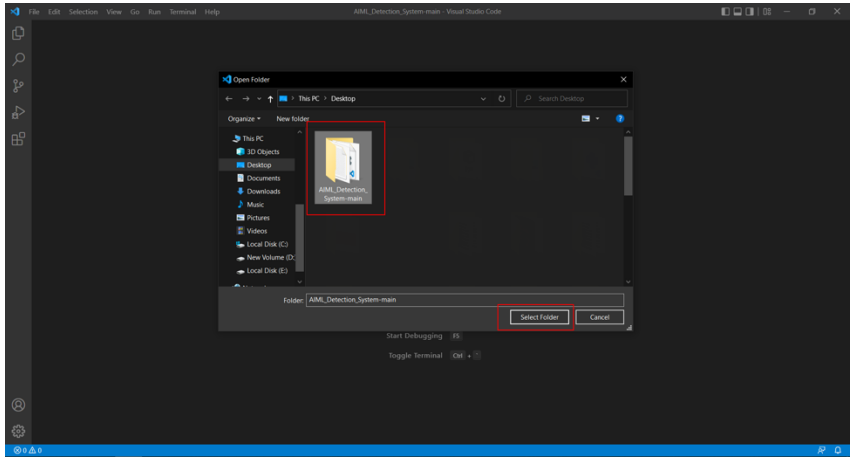
Ensure cameras are positioned to prove ample coverage. Consider blind spots and mounting the camera in an elevated position for a high vantage point and to keep out of the reach for external forces that may cause changes in the position of the cameras.

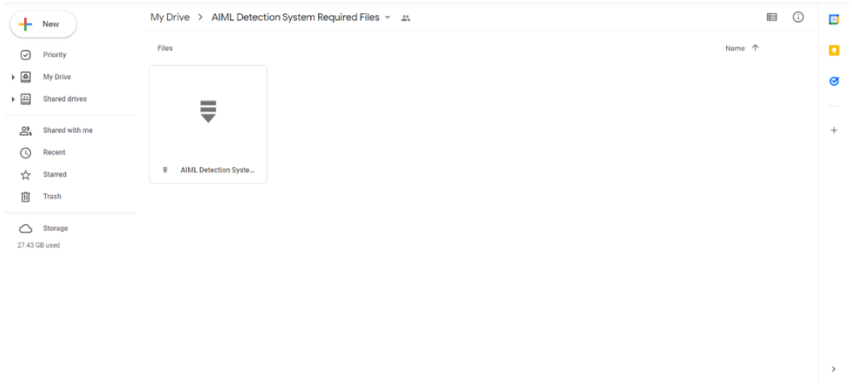
Running the System using Visual Studio Code

After downloading your Visual Studio Code IDE and downloading the file from GitHub and successfully performing the steps above, open your Visual Studio Code IDE and click the **Open Folder** option on the left side menu of your screen. See picture below for reference:



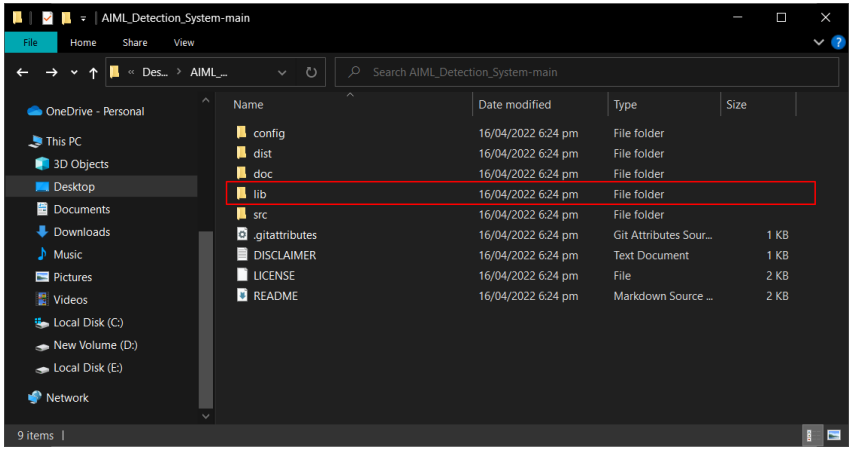
After selecting the menu, navigate to where you have extracted the folder of the **AIML Detection System.** Select the folder and click **Select Folder**.



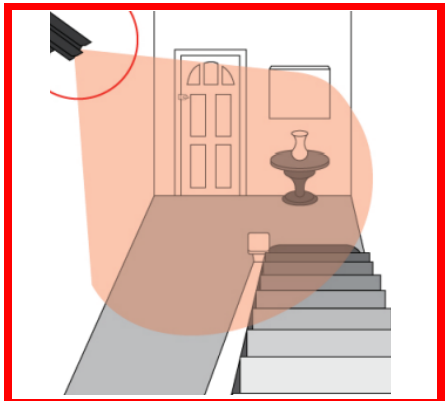


Download the zip file inside the GDrive folder and extract the content to a directory you want to put it in first. Note that the zipped file size is **2.5GB** and is around **6.5GB** when extracted.

After extracting the folder inside the zip file, extract the contents of the folder (**datalist, env, haar-cascade-files,** and **yolov3-files**) inside the **lib** folder in your project directory (for reference see picture below).

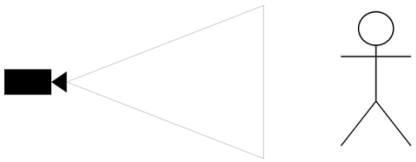


After performing this steps, you can now proceed to running the project using the Visual Studio IDE.



Inside Room

Ideally a camera placed inside a room where the elderly is located should be on a vantage point with a wider angled view of the room.



Detection Area

The camera should be placed in an angle where the whole body of the subject can be seen. This is to ensure that the subject will be monitored correctly in such cases such as the Falling Detection System, which detects the impact of the subject with the ground. This camera positioning also applies to our other systems.

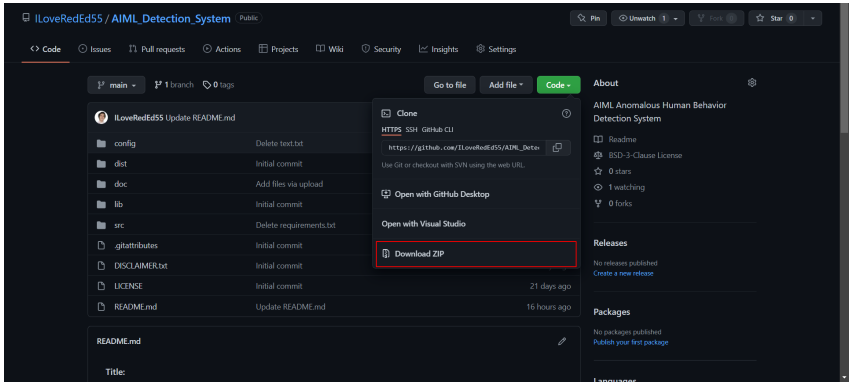
4.3 Cables

Please refer to the safety guidelines for information on the cables and power. It is important that any power cables are managed safely and protected from damage.

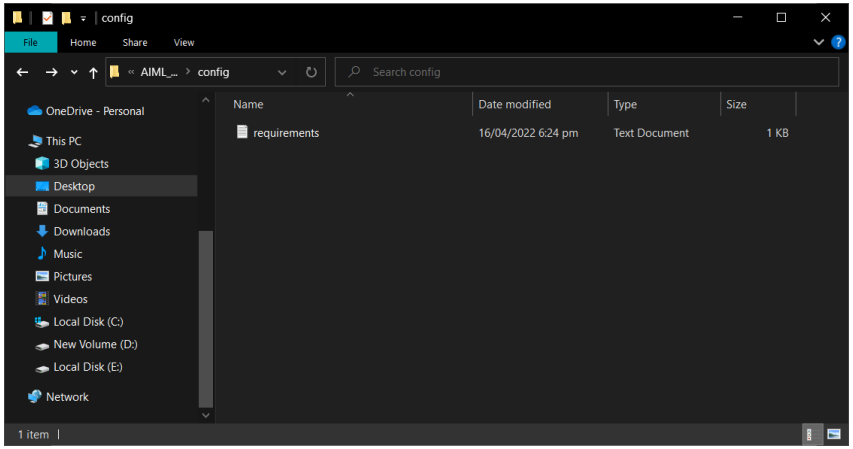
4.4 Setting up and Running the System using Visual Studio Code

Installing Required Files and Dependencies

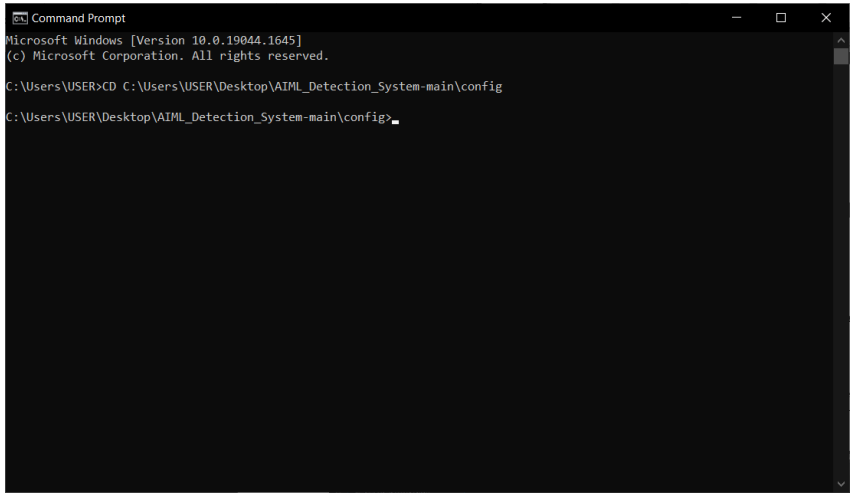
Before running the system in Visual Studio Code, you have to download first the required files and dependencies that is not included. To do this, you can visit the GitHub Repository of this project (for link, *https://github.com/ILoveRedEd55/AIML_Detection_System*). Then, download the project and extract it to wherever directory you want to put it in.



After extracting the project, you have to download the dependencies for this project. To do this, navigate to the **config** inside the directory, there you can see a text file named **requirements.txt**.



From here, open you **cmd** terminal, and type in the location for the directory of this **requirements.txt** file by using the command **CD**. (eg. **CD *C:/Desktop/AIML_Detection_System/config/***). For reference, see picture below.



After navigating to the **config** folder inside the project folder, you have to install the **requirements.txt** file to download all necessary dependencies to run the project. To do this you have to type the following line of command in the **cmd** console as shown below. This will download all required dependencies to your current base environment.

```
pip install -r requirements.txt
```

After downloading the dependencies, you now have to download the required files that was not included in the project folder. To do this, go back to the GitHub repository of this project (for link, *https://github.com/ILoveRedEd55/AIML_Detection_System*). There you can scroll down to a section of the page where it says **Steps To Run The System Using VS Code**. From there you can see the link for the GDrive folder for the Required Files as shown in the picture.

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