Auto Following Motion Security Camera

Henry V. Pham

Introduction

The Auto Following Motion Security Camera is invented with State of The Art design to solve the existing security camera problems. We live in the world with high technology, and the safety and security daily is more concerned, more demand and critical in many cases. We need a security camera that can automatically follow and record a motion target instead of manually login to an app and control the cameras manually while most of us are not physically stay at the property every time, everyday.

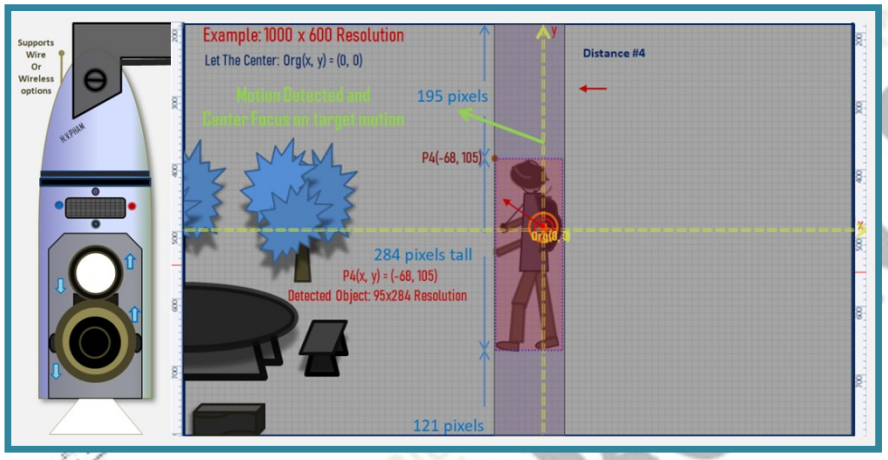

Figure-1: Auto Following Motion Security Camera - Overview

The Auto Following Motion Security Camera in this invention comes with a horizontal moment step motor which can turn the camera left and right directions up to 360° degrees, and a vertical moment step motor which can turn the camera up and down directions with at least 60° degrees. The security camera would comes with light beams which light up when detecting motion either by software scanned image motion detection or physical photo sensors which are built-in with the camera. The security camera would have an option to support prerecorded alert sounds and support custom recording alert sounds or voice for better customized environment security areas. Figure-1 above shows an overview of Auto Following Motion Security Camera. The camera has enough built-in RAM memory to capture and save low video in resolution, in monochrome bmp mode every ¼ of a second for at least 15 seconds with circular buffering techniques. When the camera detects motion object, the Auto Following Motion Security Camera will turn on the light beams and scan the motion and capture in monochrome mode, then compare pixel by pixel with the previous captured mono-mode image. The basic motion scan algorithm which is provided in this invention will help to find the motion in rectangle, and the camera will turn and focus on the motion object to the center of the image as shown in Figure-1 the overview above.

With this invention of the Auto Following Motion Security Camera, we will have better security camera system to protect our property, company, organization or point of interests. Protect property or point of interests is protect our society, protect our society is to make our society safer and more secured. So, this invention of new Auto Following Motion Security Camera is great for our society.

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Hardware Requirements

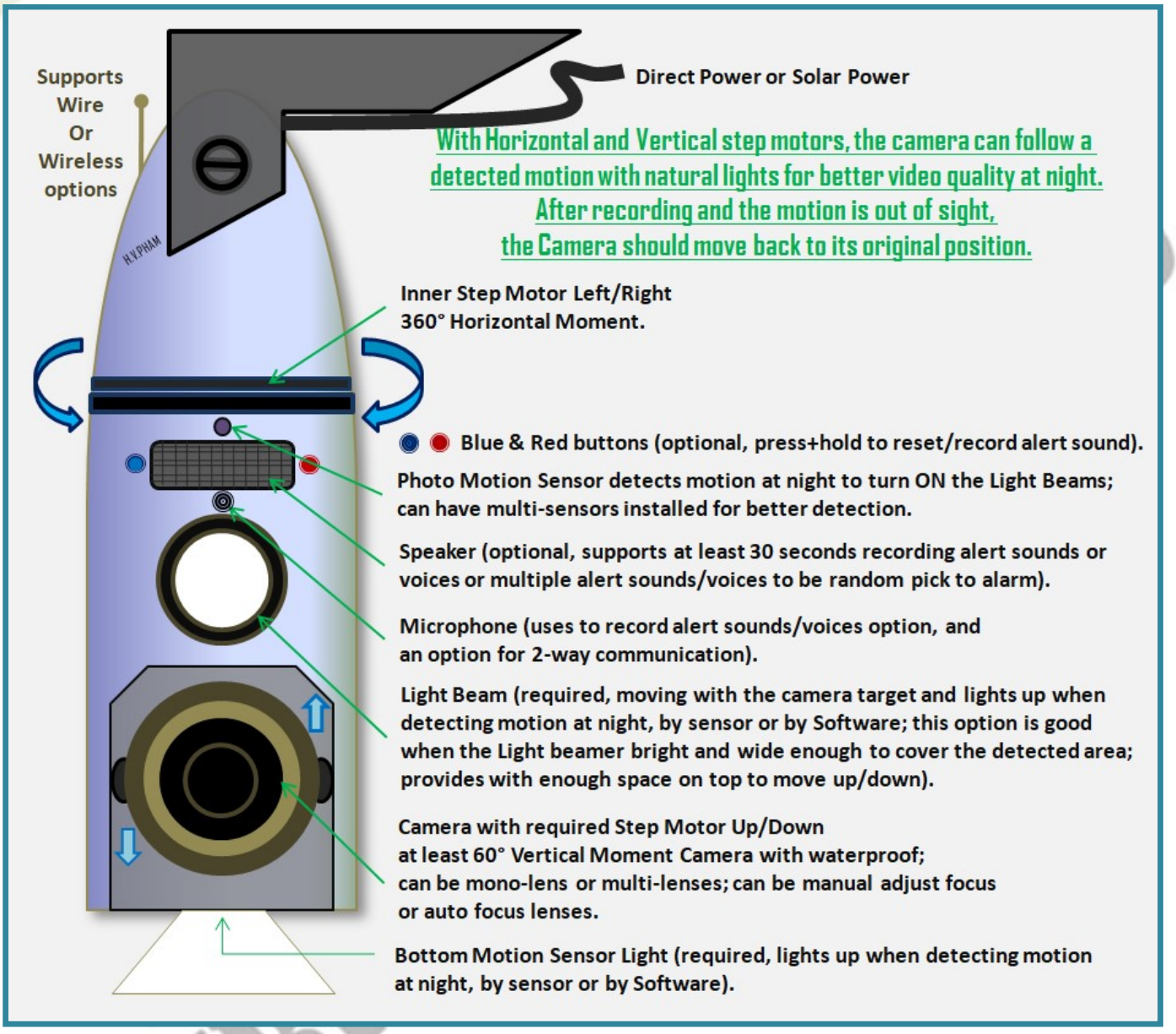

Figure-2: Auto Following Motion Security Camera with fixed Light Beam

The Auto Following Motion Security Camera requires the camera hardware as shown in Figure-2 above supports common features that required for security camera plus custom record alert sounds include speaker, photo sensors, and light beams. This option in Figure-2 shows the target motion light beam in a fixed position, this option is easy to build and good when this light beam bright and wide enough to see the motion object at night. Adding infrared light is not required for this security camera, suggest to have natural light for video recording at night would be better with more true colors than infrared by experiences.

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The inner step motor on the top part of the camera is required to turn the whole camera horizontally in 360° degrees. The camera itself has a holder which tied both sides of the camera to a step motor which can turn the camera up and down direction in at least 60° degrees below the horizontal direction within the minimum average of 2.5 meters mounting high to be enough to view the motion object down below the camera. The camera requires to have at least 2 light beams instead of having infrared lights; one light beam for following the motion object, and another one for lighting up the area right below the camera. These light beams will be triggered on by photo motion sensors, and can be turned on by the camera software when detected the motion out of range of the sensor detectable area; recommend having built-in photo motion sensors to trigger the light beams so the camera can have better detecting and recording video with higher quality while the hardware sensors are sensitive and fast enough. The lights should stay on for at least 15 seconds after there is no more motion detection.

The camera supports microphone and speaker for security camera recording, and custom record and alert sounds features. There are 2 red and blue buttons which are used to reset or record custom alert sounds; the reset to erase the recorded alert sounds function can be “press and hold” these buttons for 20 seconds, the record alert sounds function can be “press and hold” these buttons for 10 seconds, and the blue button to end of each alert sound or voice to record multiple alerts. The camera should random pick the recorded alert sounds to alarm to reduce getting used of hearing the same sounds over again. The microphone is used to record custom alert sounds and for 2-ways communication. The speaker is used to playback the recording sounds right after custom alert sounds are recorded, used for alarm sounds and used for 2-ways communication. There is at least 1 motion sensor which is used to detect the motion at night; more motion sensors can be added for better motion areas of coverage. After there is no more motion detected for at least 15 seconds, the camera should turn back to its original position with the speed of about 6° degrees per second or constant speed that good enough for turning and scanning.

The Auto Following Motion Security camera can support direct electric power connection or with solar power, and can support wire or secured wireless camera connection to Camera Hostspot or other camera viewer devices with the WPS button. The camera lens can be mono-lens or multi-lens and provides with manual preset focus or can be auto focus for more advanced. The camera must be waterproof for outdoor usage.

The camera light beam can have another option which shows in Figure-3 below with auto moment with the camera focus for better brightness while detecting the motion objects at night. The light beam on top lying right on top of the camera lens; and when the camera lens move up and down, the light beam will move with it to keep the light focus right at the motion object.

The Auto Following Motion Security camera should support a switch with 3 different options; one to turn ON/OFF alert completely, another one to alert at night time only, and the default alerts anytime of the day. The Auto Following Motion Security camera should also apply the Gradually Reduce Notification

Rule which can be GRN(1, 3, 5, 10, 15, 30; minutes rule); delays of notification up to 30 minutes when the motion still around constantly until the motion is out of the detectable area.

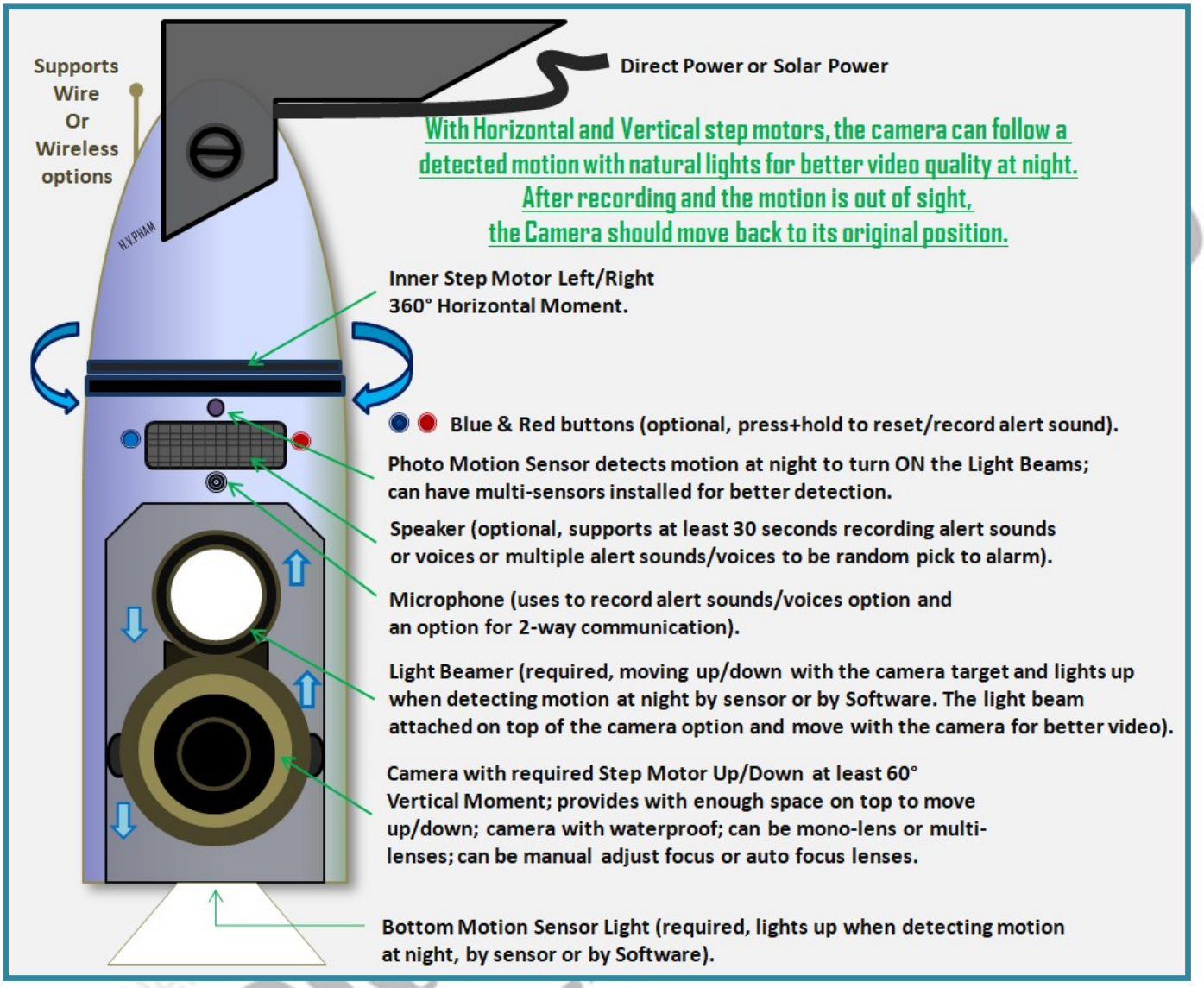

Figure-3: Auto Following Motion Security Camera with moment Light Beam

The camera requires 2 step motors, one on top which can turn entire bottom part of the camera in 360° degrees for the horizontal direction, and the other one holding the camera lens to turn the camera focus up and down direction with at least 60° degrees moment in focus. Figure-4 below shows inside 3-D front view of the top horizontal direction motor, and the inside 3-D side view of the camera lens vertical direction motor. The step motor is common device and already available in the market; this invention will not cover the topic how the step motor works since we well know the step motor can turn forward and backward depends on the current and voltage values and polarity apply to the step motor. The voltage value can be set to the hardware registers based on the values of the horizontal and vertical direction in

pixels which can be converted to voltage values to set into the hardware registers to control the step motor direction.

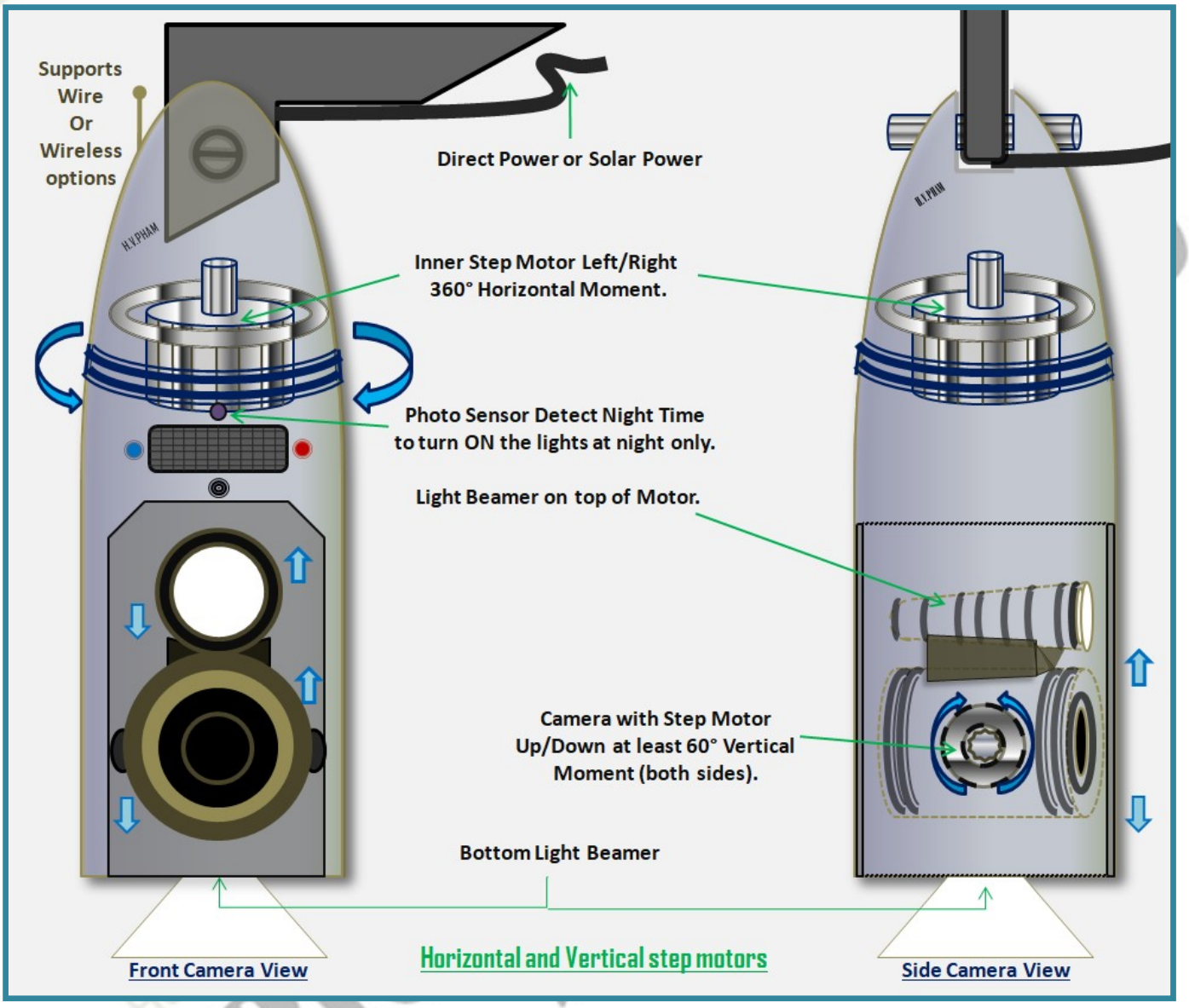

Figure-4: Auto Following Motion Security Camera with motors views

Auto Following Motion Security Camera
Firmware/Software Requirements

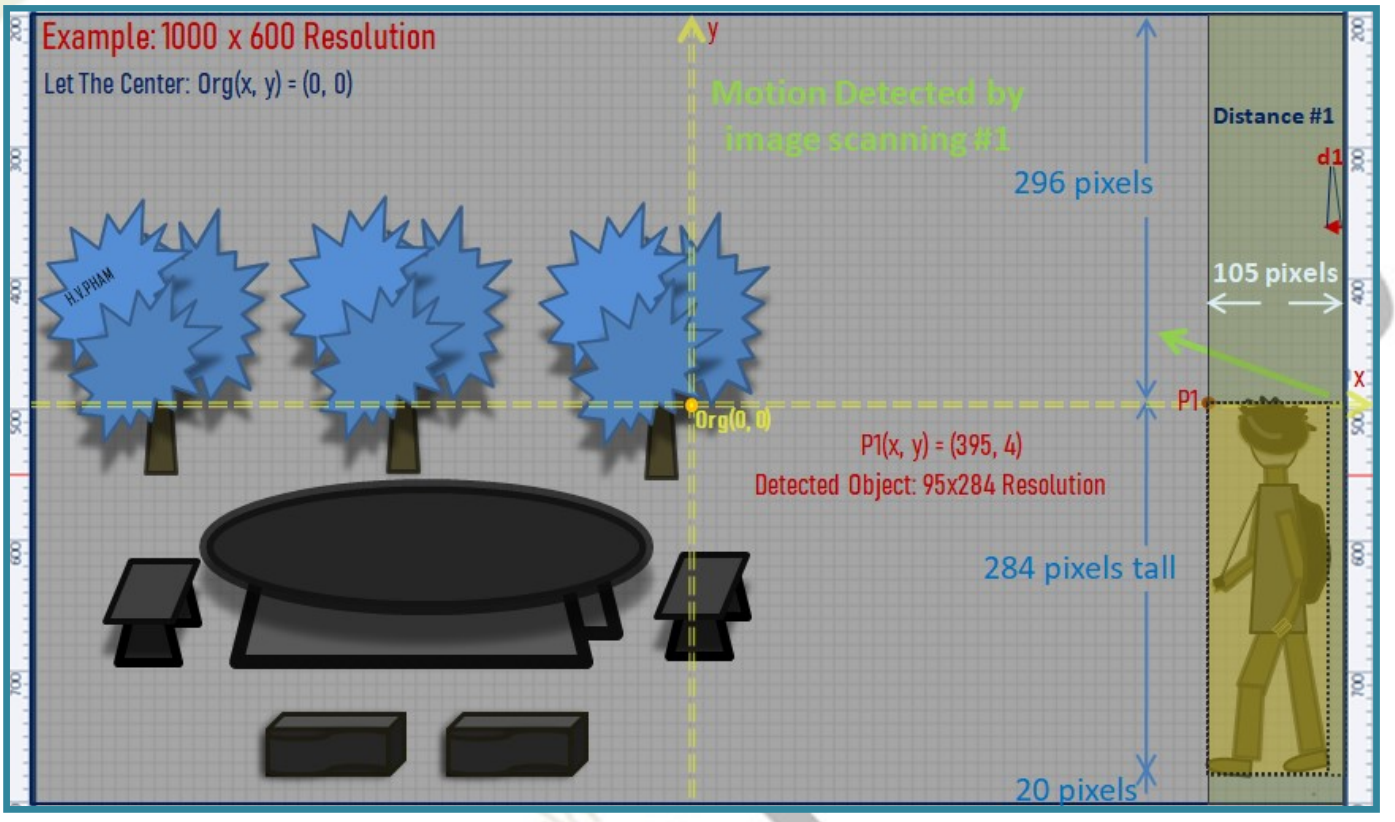

Figure-5: Auto Following Motion Security Camera Capture Motion at Position P1

The Auto Following Motion Security camera firmware/software should able to capture and scan for motion object and find the motion object rectangle to turn the camera and focus on the motion object correctly. Figure-5 above shows a sample captured image of a detected motion object at position P1(395, 4) in x and y coordinates within the rectangle of 95 pixels width and 284 pixels high. The center of the camera focus shows at the origin Org(0, 0) in x and y coordinates. The camera resolution with 1000 pixels width and 600 pixels high showing in this invention is used for the basic algorithm to calculate the position of the motion object to move the camera focus center to the motion object correctly. Position P1 is considered as the first detected motion image with the detected rectangle above the current frame bottom baseline of 20 pixels, 296 pixels below the current frame top baseline, and (105 - 95) = 10 pixels from the current right frame baseline.

Figure-6 below shows a next captured image of the detected motion object at position P2(337, 49) in x and y coordinates within the motion rectangle of 95 pixels width and 284 pixels high. The position P2 is now considered as the 2nd detected motion image without moving the focus yet. This position is now (337 – 395) = –58 pixels in the x-axis direction and (49 – 4) = 45 pixels in the y-axis direction compare to the 1st position P1.

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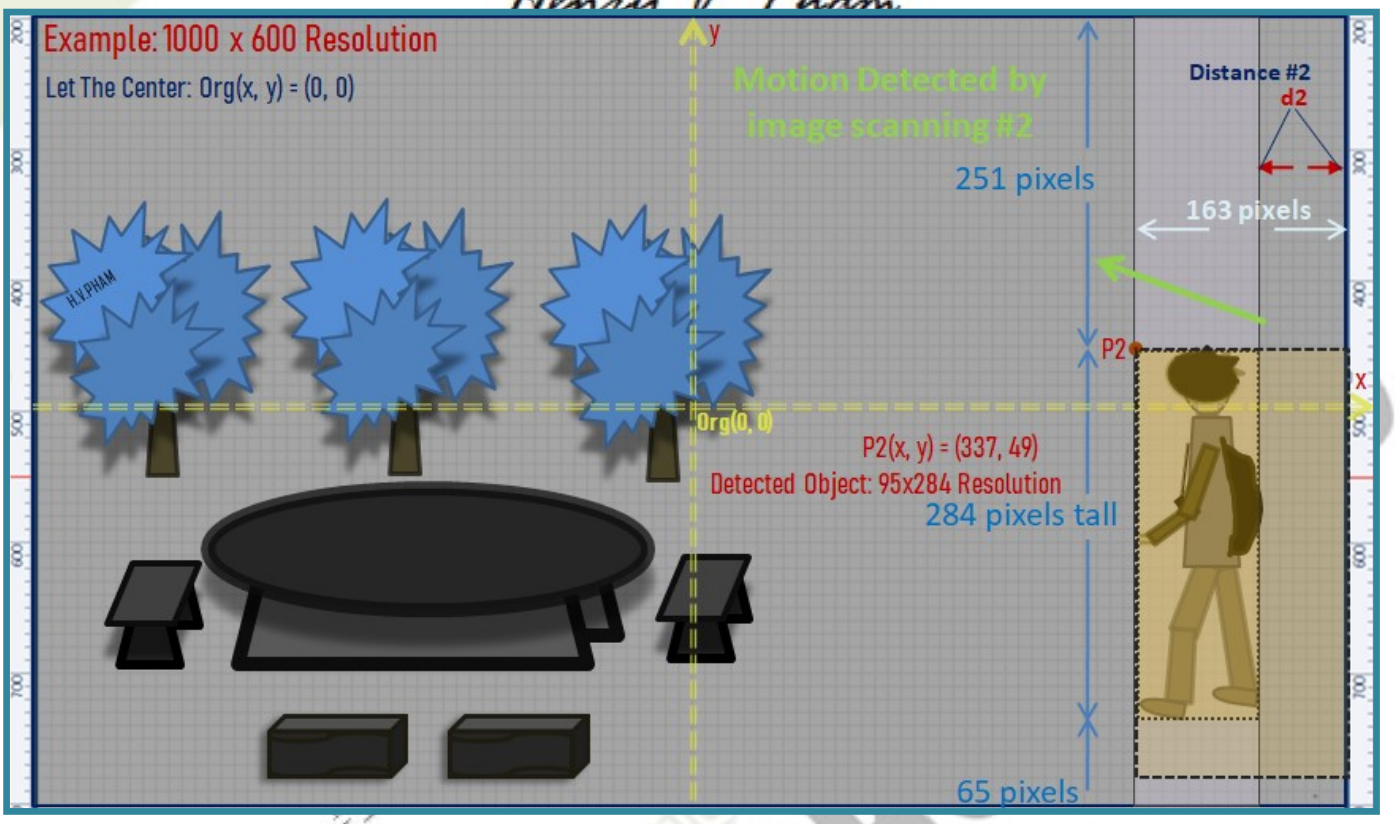

Figure-6: Auto Following Motion Security Camera Capture Motion at Position P2

Figure-7 below shows another next captured image at a moment later of the detected motion object at position P3(289, 119) in x and y coordinates within the motion rectangle of 95 pixels width and 284 pixels high. The position P3 is now considered as the 3rd detected motion image without moving the focus yet. This position is now (289 – 337) = –48 pixels in the x-axis direction and (119 – 49) = 70 pixels in the y-axis direction compare to the 2nd position P2. And this position is now (289 – 395) = –106 pixels in the x-axis direction and (119 – 4) = 115 pixels in the y-axis direction compare to the 1st position P1. We have the detected motion rectangle at this position now with 135 pixels above the current bottom frame baseline, 181 pixels below the current top frame baseline, and 116 pixels away from the current right frame baseline. From these positions details, we can use to calculate the motion object position when the camera detecting the motion and suggest that the setting for the focus center from the x and y coordinates on the motion object to 1/2 of the high of the motion rectangle and 1/3 of the motion rectangle from the top. The camera bases on these values to turn the focus and tracking the motion object right at the center of the camera screen.

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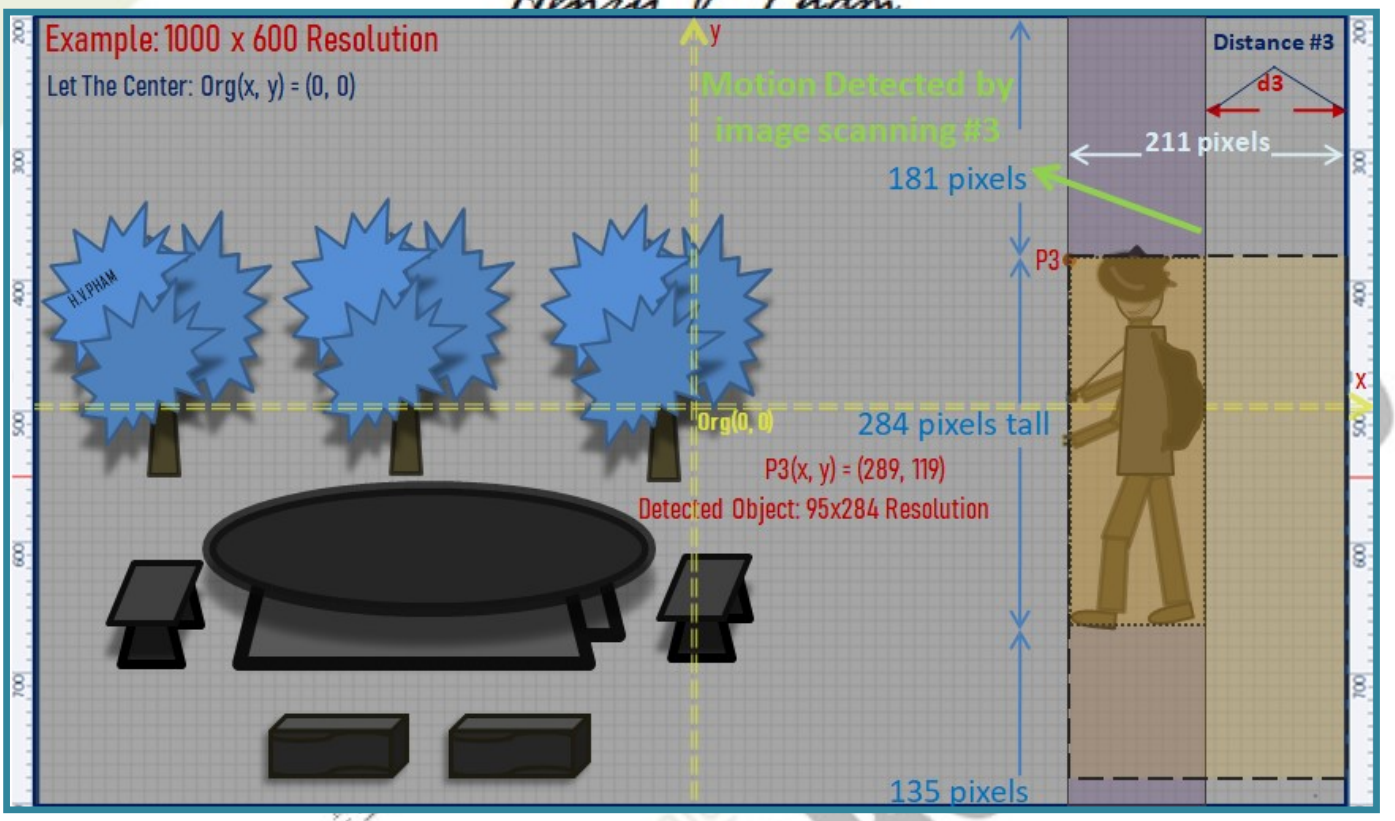

Figure-7: Auto Following Motion Security Camera Capture Motion at Position P3

Below is the basic guideline to scan horizontal and vertical direction pixel to pixel comparison from the previous capture motion image to a current moment of motion object. The basic function 'funcScanHzn(..)' provide the basic scan algorithm to scan horizontally from left to right to find the motion object showing the changes within the pixels changed lines in horizontal x-axis direction. The basic function 'funcScanVrt(..)' provides the basic scan algorithm to scan vertically from top to bottom to find the motion object showing the changes within the pixels changed lines in vertical y-axis direction. And the basic steps to find the rectangle of the motion object based on the crossed horizontal and vertical rows/columns pixels scanned method. First, check and connect the motion width horizontally; second, check and connect the motion height vertically; third, check and connect the motion shape if found. Then finally, validate the scanned motion shapes and choose the largest shape to focus on. To find the target position to set the motor to move to the motion object right on the center of the screen, with these details found, we can set the camera turn to the target on the center point, suggest to use 1/2 of the width and 1/3 of the height of the detected motion rectangle from the top for object in real life of a human in motion.

// Basic Guideline Function Scan Horizontally: Start scanning horizontal direction from left to right for //resolution 1000w x 600h.

```
funcScanHzn(600PixelsLine, 10PixelesStep)
{
   For each pixel line with 600 pixels; step by 10 pixels
   {
      If (previous image Line Pixel != current image Line Pixel)
      {
          (H1) Mark line changed for this pixel number changed flag for lookup later;
          (H2) Save start pixel number if (equals -1) not save yet for first scan of this line (initial value = -1);
          (H3) Save end pixel number of this line to mark the last pixel changed;
          (H4) Record number of pixels changed for this line (initial value = 0);
      }
      Else and if already found changed pixel lines, make sure this is the last line
      {
          Scan forward every 1 pixel line to find the actual last pixel line for better motion shape and set
         (H1, H3, and H4 lines).
      }
   }
}
```

// Basic Guideline Function Scan Vertically: Start scanning vertical direction from top to bottom for //resolution 1000w x 600h.

```
funcScanVrt(1000PixelsLine, 10PixelsStep)
{
   For each pixel line with 1000 pixels; step by 10 pixels
   {
       If (previous image Line Pixel != current image Line Pixel)
       {
          (V1) Mark line changed for this pixel number changed flag for lookup later;
          (V2) Save start pixel number if (equals -1) not save yet for first scan of this line (initial value = -1);

          (V3) Save end pixel number of this line to mark the last pixel changed;
          (V4) Record number of pixels changed for this line (initial value = 0);
      }
      Else and if already found changed pixel lines, make sure this is the last line
      {
          Scan forward every 1 pixel line to find the actual last pixel line for better motion shape and set
         (V1, V3, and V4 lines).
      }
   }
}
```

// Guideline: Check for any motion shapes found for resolution 1000w x 600h.
// 1st, check and connect the motion width horizontally

For each pixel line with 600 pixels; step by 10 pixels or Start to Last Changed Pixel Line
{
    if(current image Line Pixels in step (H4) > 0)
    {
        (a) Save start motion line number if (equals -1) not saved yet (initial value = -1);
        (b) Save end motion line number as the next or last line;
    }
}

// 2nd, check and connect the motion height vertically

For each pixel line with 1000 pixels; step by 10 pixels or Start to Last Changed Pixel Line
{
    if(current image Line Pixels in step (V4) > 0)
    {
        (a) Save start motion line number if (equals -1) not saved yet (initial value = -1);
        (b) Check if this line has pixels changed within the scan in steps (H2, H3, V2, V3);
        (c) Save end motion line number as the next or last line;
    }
}

// 3rd, check and connect the motion shape if found

Check and validate motion shapes

1) Find the width of the motion shape in pixels = Last Changed Line(H3) – First Changed Line(H2);

2) Find the height of the motion shape in pixels = Last change Line(V3) – First Changed Line(V2);

3) For this application, we only need to find the rectangle of motion shape, so we can use the last and first lines of the motion shapes; and no need to identify and redraw the actual motion.

4) The Camera manufacture can adjust and tune this algorithm from 10 pixels to 5 pixels or lower pixels step if needed.

5) To detect slow moving object better, suggest to keep capturing image every 5 seconds and scan for the different pixels changed within every 5 seconds for slow motion object.

6) And keep track and ignore tree leaves moving when it's windy by checking the motion noise moving back and forth, not the entire shape moving.

7) If more than 1 shape is found, then use the largest shape. This is the motion object shape within the rectangle.

   Finally, to find the target position to set the motor to move to the motion target right on the center of the screen, suggest to the camera software to use 1/2 of the width and 1/3 of the high of the detected motion rectangle.

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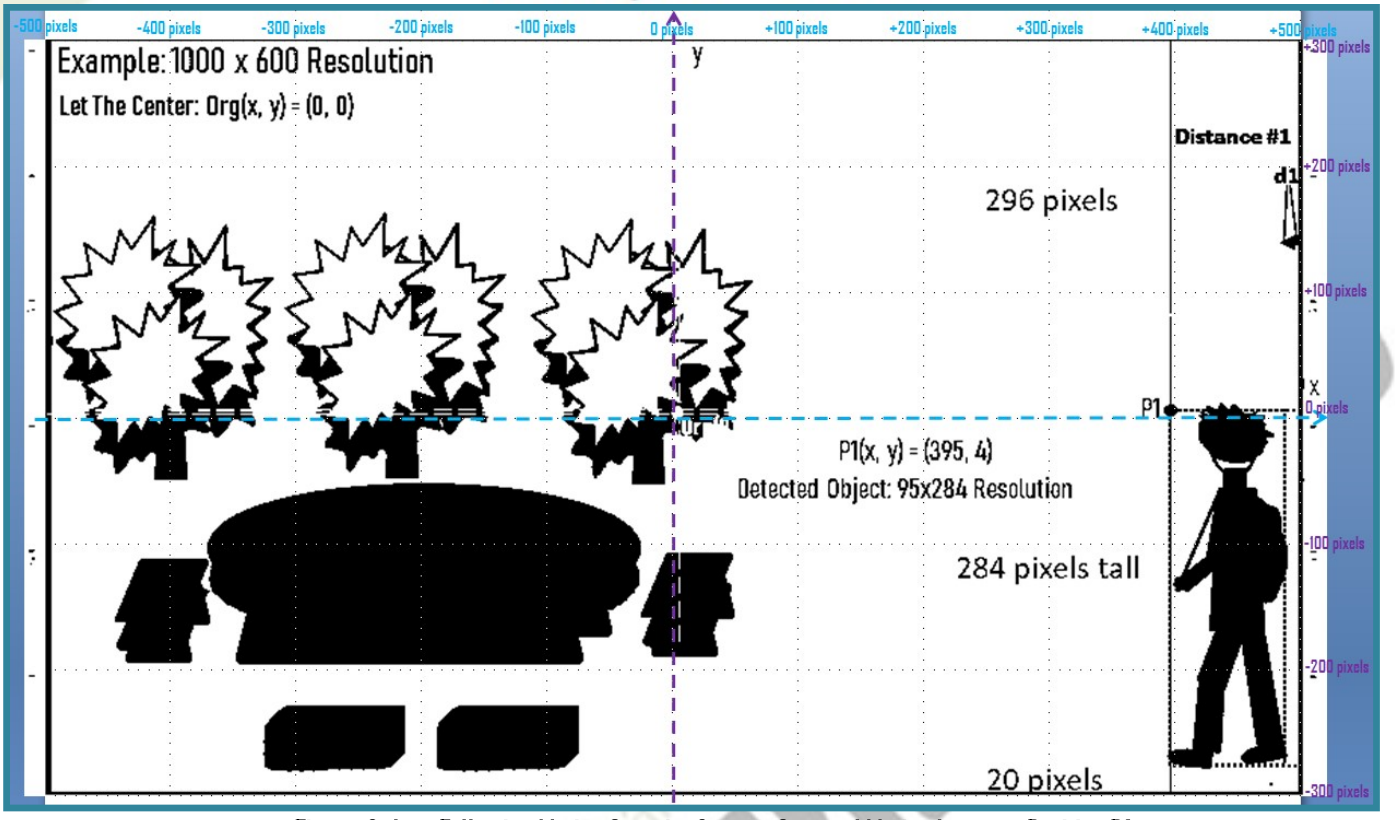

Figure-8: Auto Following Motion Security Camera Scanned Motion Image at Position P1

The technique to scan the image for the difference quickly is to save the image in monochrome or in raw bmp file mode, then scan and compare pixel by pixel of the 2 images. Figure-8 is the monochrome mode of the Figure-5 above with the pixel scales showing in the x and y coordinates with the center origin point Org(0, 0). Below are the steps from capturing a mono-mode image every 0.25 second in circular buffers and put the capture images in order of timestamp to compare and scan for the detected motion rectangle.

1. Capture and save image in monochrome mode (bmp) or raw mono mode every 0.25 second.
2. Follow the basic algorithm provided above to scan for the motion shape. Then use the center position as the offsets to calculate position $\mathbf{P_n}(x, y)$ for x and y pixel coordinates to use the formula below.
3. From the above method applied for this figure, we have the motion in the rectangle 284 pixels height and 95 pixels width at the position P1(395, 4) from the origin at the center; and the rectangle above the baseline 20 pixels. The position P1 is the first detected position.
4. Let the motion rectangle shape be $R_m(w, h) = R_m(95, 284)$; where w is the width and h is the high of the motion rectangle. The suggestion motion Center Target Position $P_c(x_c, y_c)$ formula for this position is,

$$\mathbf{P_c(x_c, y_c) = P_n(x_n, y_n) + R_m(w/2, -h/3) = P_n(x_n + w/2, Y_n - h/3);}$$

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This formula should work for the motion comes from any direction. This case the motion is coming from the right direction; comes from the left direction also works with this formula. Note that the center position is right at the center of the capture image which is used in x and y coordinates. Then from the figure above, we have $P_c(395 + 95/2, 4 – 284/3) = P_c(442.5, –90.7) = P_c(443, –91)$;

Where x = +443 pixels in x-axis, and y = –91 pixels in y-axis from the center origin of the capture image. We need to set the hardware registers for horizontal motion motor move to the right in positive direction of +443 pixels distance, while setting the hardware registers for vertical motion motor move downward (negative) direction of –91 pixels distance; suggest both motors moving with the same percentage moment. This is the best suggestion position to follow the motion target for Auto following Security Camera. The camera firmware should record this position and use to track for the next motion or use to move back to the origin center position later. The camera should support reset position back to the original center position after completely detecting the motion for at least 15 seconds after the motion object is gone; this case the firmware no needs to keep track every motion positions. While recording and tracking the motion target object, the camera should alert with prerecorded sounds or voices if the camera is supported and enabled.

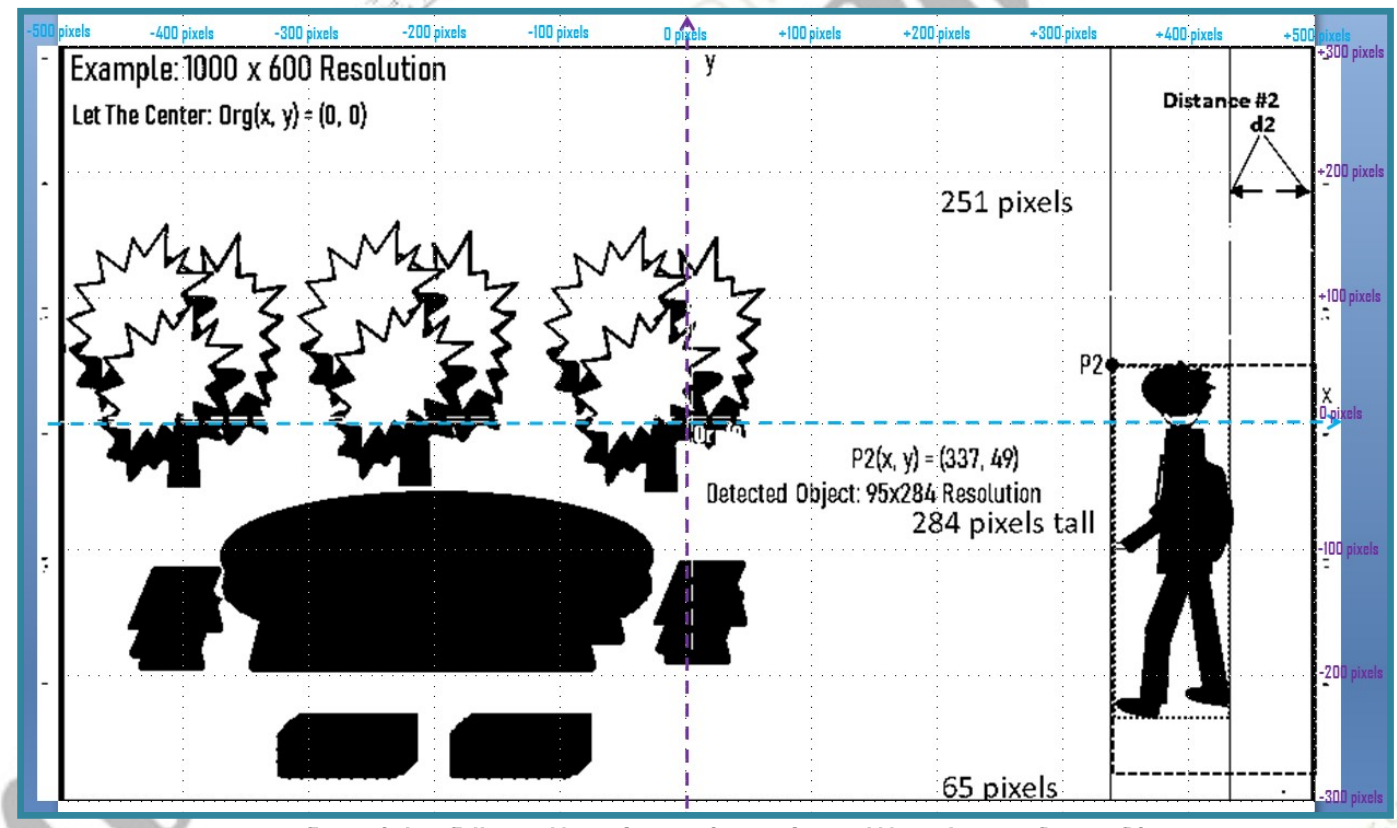

Figure-9: Auto Following Motion Security Camera Scanned Motion Image at Position P2

The same method scanning above, we can scan the capture mono-mode image in Figure-9 which was saved from original image in Figure-6 for position P2. Below are the steps from capturing a mono-mode

image every 0.25 second in circular buffers and put the capture images in order of timestamp to compare to scan for the detected motion rectangle.

1. Capture and save image in monochrome mode (bmp) or raw mono mode every 0.25 second.
2. Follow the basic algorithm provided above to scan for the motion shape. The method of scanning should work for the motion object detect at the first place or at the later position by comparing pixels to pixels of line by line from the previous capture to the newer capture image.
3. From the above method applied for this figure, we have the motion in the rectangle 284 pixels height and 95 pixels width at the position P2(337, 49) from the origin at the center; and the rectangle above the baseline 65 pixels. The position P2(337, 49) is about 58 pixels (X-axis) and 45 pixels (Y-axis) in closer distance to the center from position P1(395, 4).
4. Assume that the camera has not yet moved or followed the target after the first capture image. Let the motion rectangle shape be $R_m(w, h) = R_m(95, 284)$; where w is the width and h is the high of the motion rectangle. The suggestion motion Center Target Position **$P_c(x_c, y_c)$** formula was defined and repeat again,

   $P_c(x_c, y_c) = P_n(x_n, y_n) + R_m(w/2, -h/3) = P_n(x_n + w/2, Y_n - h/3)$;

   Then from the figure above, we have $P_c(337 + 95/2, 49 – 284/3) = P_c(384.5, –45.7) = P_c(385, –46)$;

   Where x = +385 pixels in x-axis, and y = –46 pixels in y-axis from the center origin of the capture image. We need to set the hardware registers for horizontal motion motor move to the right in positive direction of +385 pixels distance, while setting the hardware registers for vertical motion motor move downward (negative) direction of –46 pixels distance; suggest both motors moving with the same percentage moment. This is the best suggestion position to follow the motion target for Auto following Security Camera. Again, while recording and tracking the motion target object, the camera should alert with prerecorded sounds or voices if the camera is supported and enabled.

The same method scanning above, we can scan the capture mono-mode image in Figure-10 which was saved from original image in Figure-7 for position P3. Below are the steps from capturing a mono-mode image every 0.25 second in circular buffers and put the capture images in order of timestamp to compare and scan for the detected motion rectangle.

1. Capture and save image in monochrome mode (bmp) or raw mono mode every 0.25 second.
2. Follow the basic algorithm provided above to scan for the motion shape. The method of scanning should work for the motion object detecting at the first place or at the later position by comparing pixels to pixels of line by line from the previous capture to the newer capture image.

Auto Following Motion Security Camera

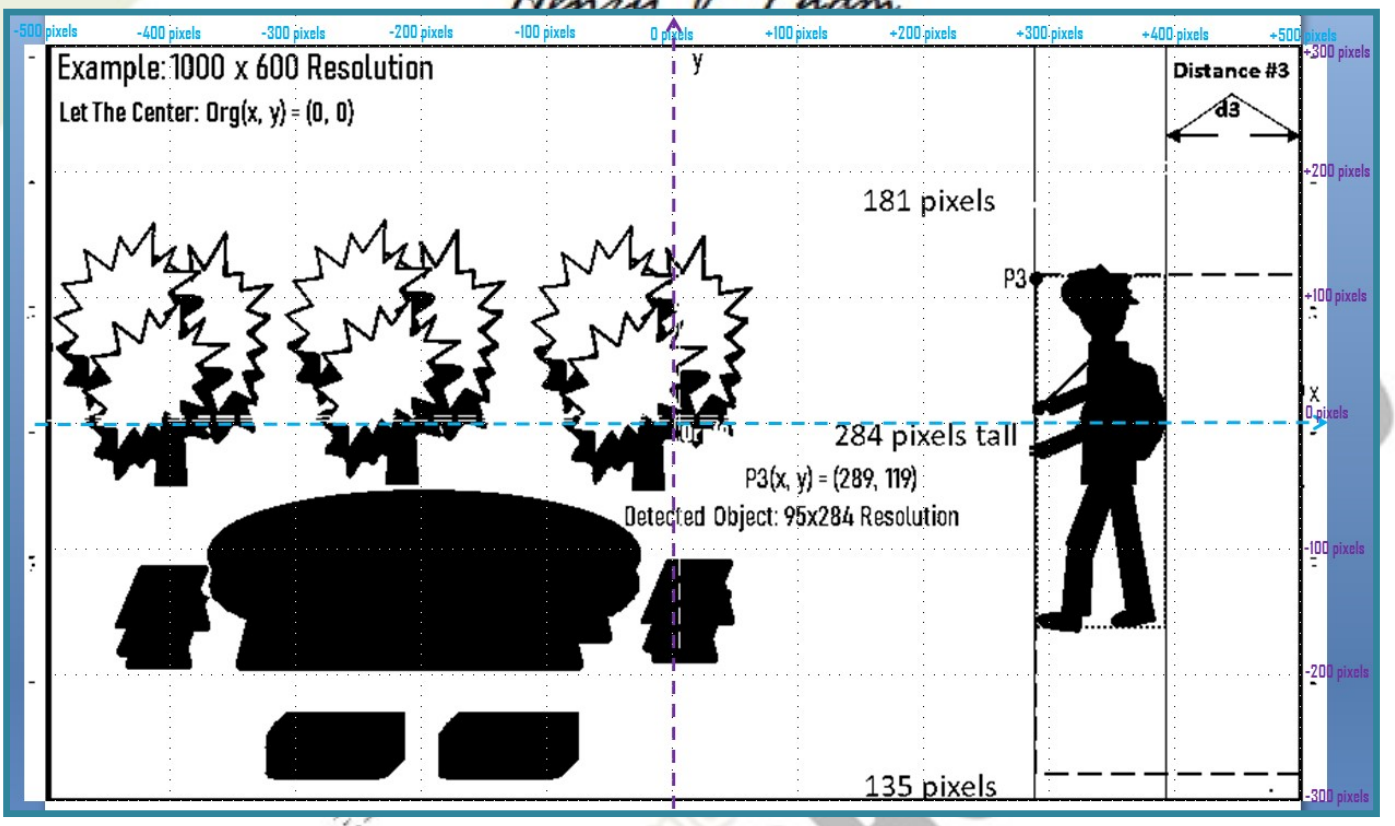

Figure-10: Auto Following Motion Security Camera Scanned Motion Image at Position P3

3. From the above method applied for this figure, we have the motion in the rectangle 284 pixels height and 95 pixels width at the position P3(289, 119) from the origin at the center; and the rectangle above the baseline 135 pixels.
4. Assume that the camera has not yet moved or followed the target after the first capture image. Let the motion rectangle shape be $R_m(w, h) = R_m(95, 284)$; where w is the width and h is the high of the motion rectangle. The suggestion motion Center Target Position **$P_c(x_c, y_c)$** formula was defined and repeat again,

   $P_c(x_c, y_c) = P_n(x_n, y_n) + R_m(w/2, -h/3) = P_n(x_n + w/2, Y_n - h/3)$;

   Then from the figure above, we have $P_c(289 + 95/2, 119 – 284/3) = P_c(336.5, 24.3) = P_c(337, 24)$;

   Where x = +337 pixels in x-axis, and y = +24 pixels in y-axis from the center origin of the capture image. We need to set the hardware registers for horizontal motion motor move to the right in positive direction of +337 pixels distance, while setting the hardware registers for vertical motion motor move upward (positive) direction of +24 pixels distance; suggest both motors moving with the same percentage moment. This is the best suggestion position to follow the motion target for Auto following Security Camera. Again, while recording and tracking the motion target object, the camera should alert with prerecorded sounds or voices if the camera is supported and enabled.

Auto Following Motion Security Camera

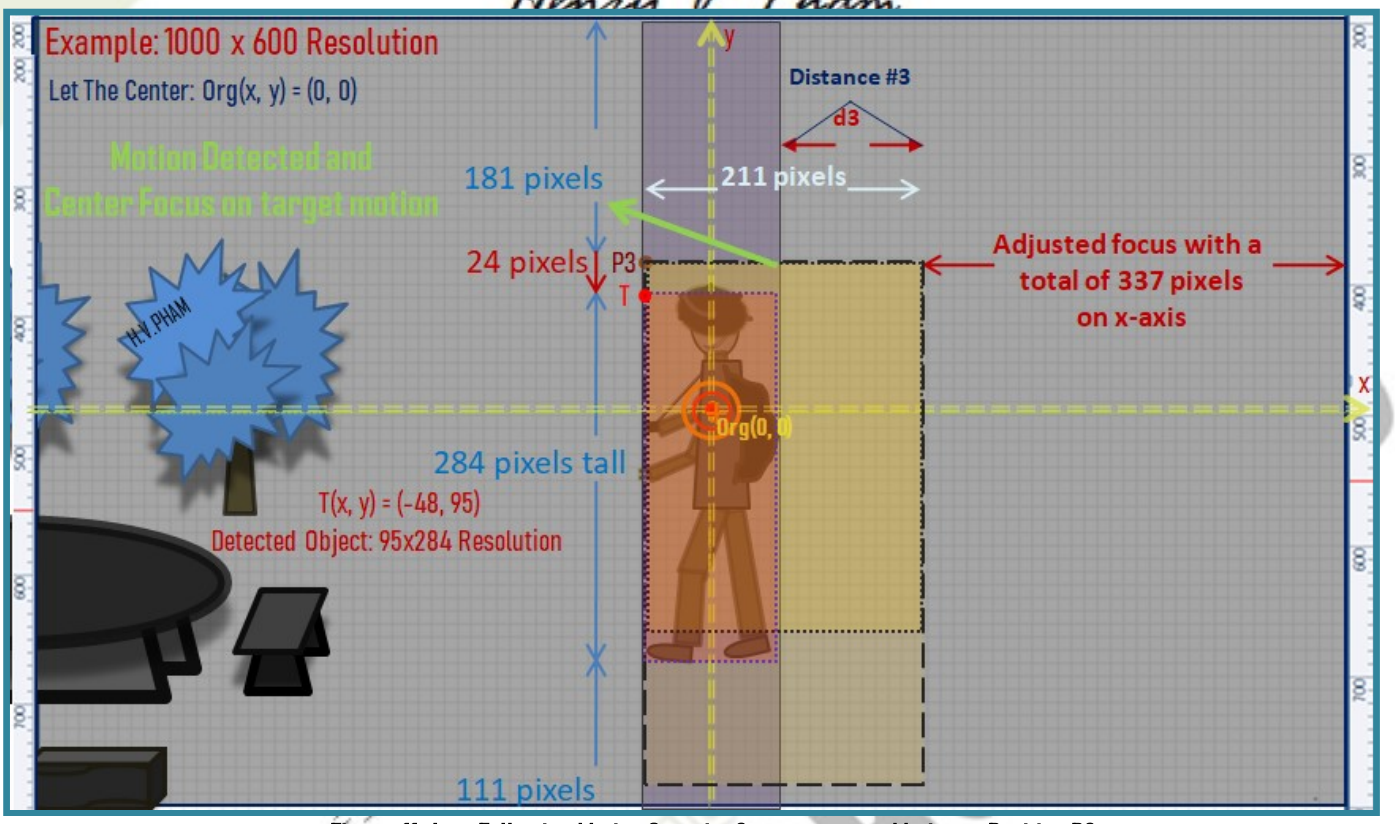

Figure-11: Auto Following Motion Security Camera targets Motion at Position P3

Finally, the Auto Following Motion Security camera is expected to move and focus on the motion target at position P_c(337, 24) in x-axis horizontal direction of 337 pixels and in y-axis vertical direction of 24 pixels from the original position before detecting at position P1. Now, the motion target is set right at the center of the screen as shown in Figure-11 above after the camera software set motor controllers to move with the correct values which have been calculated in the above procedures with assumption that the camera has not moved yet before detecting at position P1.

After the motion target is located at the target center of the camera, suggest the firmware to use this position by scanning left, right, top, and bottom start from the centered detected position to recalculate and reshape the rectangle for the new motion position for faster scan and following the target. For more security purposes, while detecting and following the motion target with this optimization method, the camera firmware should rescan entire capture image at least every 10 seconds to ensure if there are more other motion objects approaching. If there is more other motion objects detected, the camera should use the algorithm above to detect the rectangle of the larger motion object then follow the new larger target for more security purposes. Again, while recording and tracking the motion target object, the camera should alert with prerecorded sounds or voices if the camera is supported and enabled.

Now the motion target is right at the center of the screen, and the next capture image shows in Figure-12 below with the motion object keeps moving forward in the same direction. From this center positioning location of the moving object, we can apply optimization scanning for faster detecting the

motion target to follow and keep at center. Below are the steps for fast scanning and following the motion target.

1. Continue from position P3, now the camera moves and targets on the motion, and the motion rectangle is now right at the center and position of the target position T(-48, 95). Then the motion continually moving to position P4(-68, 105).
2. Follow the basic algorithm provided above to scan for the motion shape, or this can be used the Centered Detected Following method by scanning left, right, top, and bottom start from the centered detected position to recalculate and reshape the rectangle for the new motion position for faster scan and following the target.

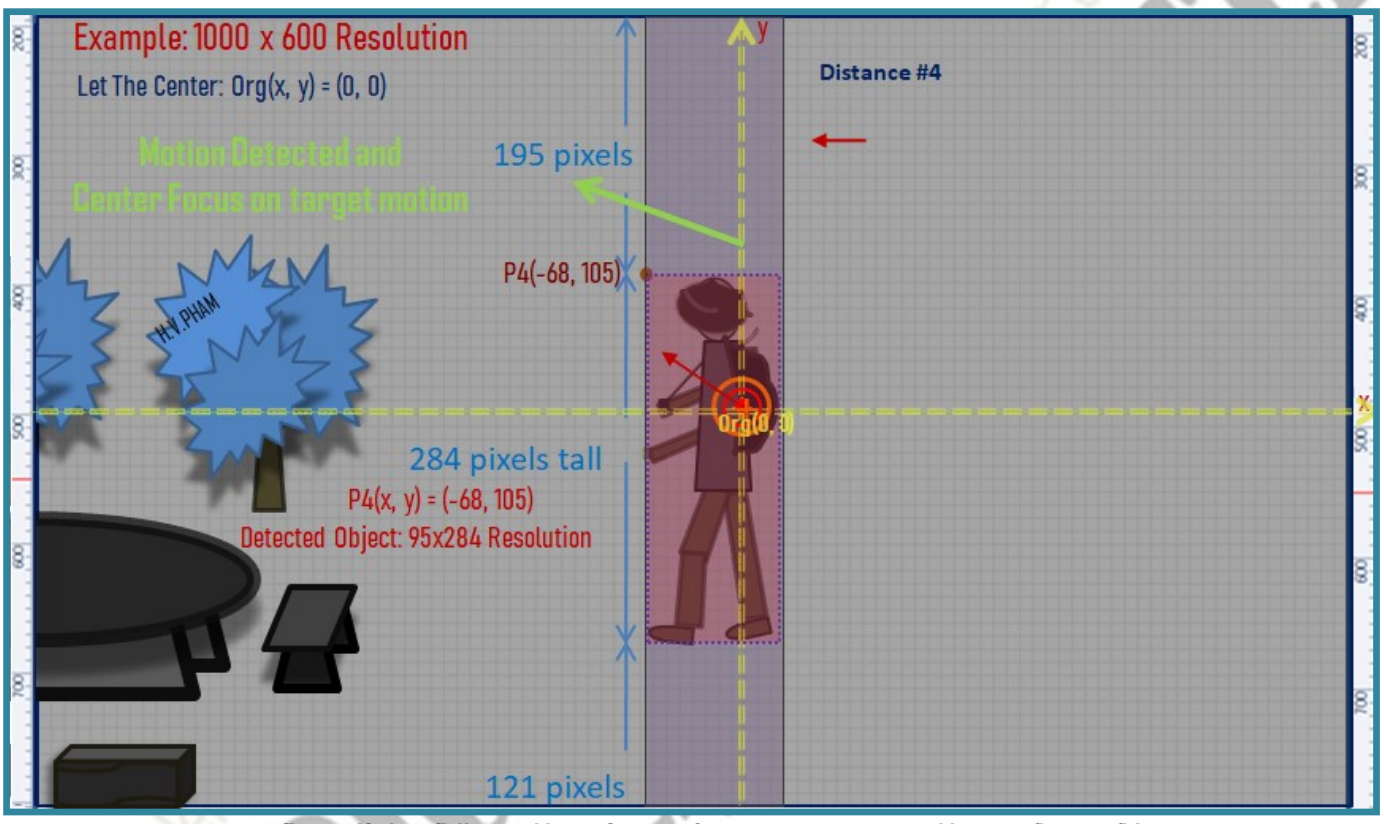

Figure-12: Auto Following Motion Security Camera continue targets Motion at Position P4

3. From the above method applied for this figure, we have the motion in the rectangle 284 pixels high and 95 pixels width approximately at the position P4(-68, 105) from the origin at the center; and the rectangle above the baseline 121 pixels.
4. By applying the optimization method above after the motion object has been focus on target, from Figure-12 above, the suggestion motion Center Target Position $\mathbf{P_c(x_c, y_c)}$ formula was defined and repeat again,

   $P_c(x_c, y_c) = P_n(x_n, y_n) + R_m(w/2, -h/3) = P_n(x_n + w/2, Y_n - h/3)$;

   Then from the figure above, we have $P_c(-68 + 95/2, 105 - 284/3) = P_c(-20.5, 10.3) = P_c(-21, 10)$;

Where x = –21 pixels in x-axis, and y = +10 pixels in y-axis from the center origin of the capture image. We need to set the hardware registers for horizontal motion motor move to the right in negative direction of –21 pixels distance, while setting the hardware registers for vertical motion motor move upward positive direction of +10 pixels distance; suggest both motors moving with the same percentage moment. This is the best suggestion position to follow the motion target for Auto following Security Camera. Again, while recording and tracking the motion target object, the camera should alert with prerecorded sounds or voices if the camera is supported and enabled.

Auto Following Motion Security Cameras System

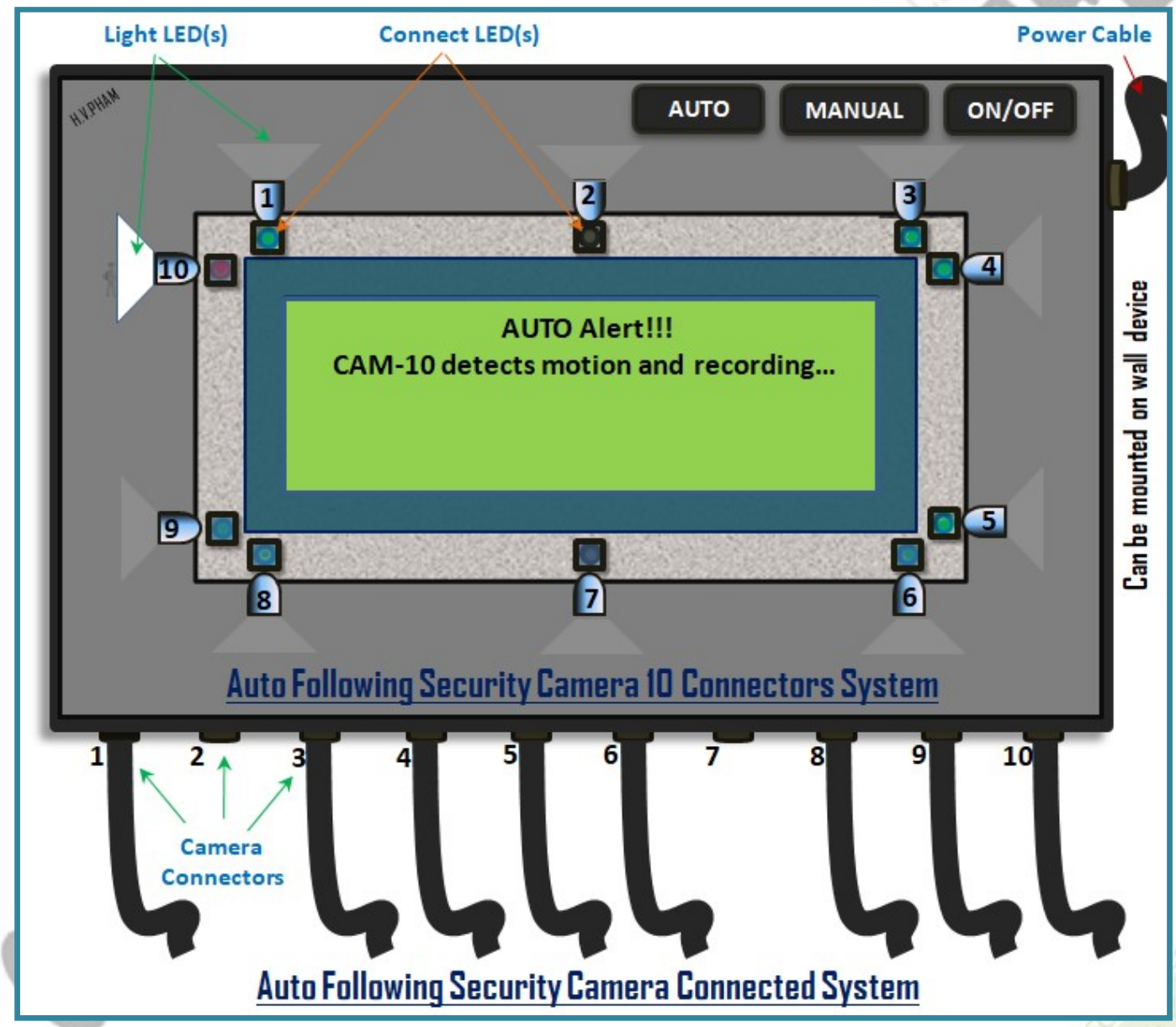

Figure-13: Auto Following Motion Security Camera Connected System Device

Auto Following Motion Security Camera

The Auto Following Security Camera can be connected together into a system with a physical layout or a software app showing the physical layout of a building to help the security team monitor the entire building better with the layout of cameras in sequence order. However, this security camera connected device is optional and it is recommended for security camera system that needs security team to monitor and control the cameras to secure the building. Figure-13 above shows the camera security system with 10 camera connections. The more camera connections of the device is, the more cameras to connect to have a better area of coverage. The owners can choose the best layout to have better control for their security camera system. The Connected LEDs indicate the camera status, the LED with black or no-light button is not connected; the LED with green button is connected; the LED with red button is detecting and recording the motion. The Light LED shows white color to indicate the camera is active and recording. This camera security device can be programmed to set automatic or manual mode.

This Auto Following Security Camera Connection device when it is set to manual, the users or security team can have full control of a camera and manually navigate the camera to explore for any suspect moving objects within that camera explore-able area. A camera can be selected for manual mode by pressing camera button and the Manual button to operate. During this manual mode, the selected camera may not need to perform automatic alert when detecting any motion objects; the security team will have full control and monitor with this camera.

The Auto Following Security Camera Connection device when it is set to default automatic mode, the camera will automatically monitor and alert for any motions. This Security Camera Connection device can perform scanning, and tracking the motion objects more accurately that would depend on the Security Cameras Layout. If the security team have more cameras installed and cover overlap area of coverage from one camera to another with great layout, then the Auto Following Motion Security Camera system will work better and automatically track and record the motion target more accurately. *A hint to have a even better security camera coverage is to have a 2nd level security camera outside border or around the fence of the building watching inward direction of the building while the main security camera level watching outward direction of the building to cover the inner blind spots that the inner security cameras level cannot able to view*.

To support this option for the Auto Following Motion Security Camera System, the requirement for the Auto Following Motion Security camera needs to support manual control either wire or secured wireless to help the users or security team control the cameras manual.

Conclusion

The Auto Following Motion Security Camera is invented with State of The Art design to solve the existing security camera problems with high technology for more safety and security concerned to prevent dangerous situations in many cases. We need a security camera can automatically follow and

record a motion target instead of manually login to an app and control the cameras manually while most of us are not physically stay at the property every time, everyday. With this invention of the Auto Following Motion Security Camera, we will have better security camera system to protect our property, company, organization or point of interests. Protect property or point of interests is protect our society, protect our society is to make our society safer and more secured. So, this invention of new Auto Following Motion Security Camera system is great for our society.

References

1. For a great Security Camera System prevent online deleting video recording files and Cloud OS ready, please refer to my other invention "Wall Security Camera System" which was invented the same time with this invention. For more detail and about my other inventions, please visit my website, www.TheCloudOSCenter.com ; below is on the figures from the invention which shows how the security camera system looks like.

Figure-R1: Reference setup view of Wall Security Camera System Viewer

2. There are more security issues to concern in real life. I have the website www.ThePatrolCircle.com which lists the concept of Drone in patrol circle to secure the building or point of interest by drone flying around in circle watching and alert for any motion within the area circle using my invention "**THE LPS – Local Positioning System**" with **U.S. Patent Number PCT/US21/72562** and International **Patent Number PCT/IB2021/000949** which was submitted on 2021/11/23. This invention is also listed on my main business website www.TheCloudOSCenter.com.