How it works? Car Location using AI and Geo Location.

Q. How the original model works?

A. It works like this:

**World**

- We have our world, like our surroundings and stuff

- In that we need to locate a position of a car.

- Now for that we need only two co-ordinates (X,Y)

- Visualize it yourself. An object is 23 m from X axis and 14m from Y axis. (23,14).

- We just only need these two co-ordinates to locate anything. Even in your own room.

So how exactly our system works?  
  
Well, as obvious, we need CCTV camera. Let’s fix it somewhere. So in this setup we have a CCTV Camera fixed on a pole. This camera sees everything that we see.

Now it captures images frame by frame (That’s how video recording works. Record frame by frame.)  
We just need 1 frame (Or layman terms, 1 Image) for locating a car.

Let’s assume it captures a frame/image which has the car we need to locate. Let’s call this image ‘Image\_of\_Car.jpeg’.

Here comes our AI Model YOLO, from python we give that Image\_of\_Car.jpeg image. YOLO will identify car from that image and calculate some mathematical things. You do not need a PhD in what YOLO will calculate and give us. Just remember that it will give us some mathematical results.

We take those results and do some mathematical computing shit. End result is – We get the ACTUAL Coordinates of the car.

GeoPy will be fed the coordinates – It basically connects to online and finds the “Name” of the place or any recognizable place on map which can be usefull for locating. For Example: For some coordinates GeoPy gives 120 m west of Main Gate Shopping Mall.   
  
Folium is just a module to point/put a marker/locate to THAT point on map. So if we give it CALCULATED CORDINATES. IT WILL Drop/put a marker TO THE Position of the car on map.   
  
That means using those coordinates, Folium can actually (AND graphically) locate the position of car on that map! Folium will use either Google Maps API OR OpenStreets Api to show the location on map. For example: It will use a Google Map of Bhopal, and give us an image of the map where you have location of car.   
  
So this is how it flows:  
  
CCTV captures image of car 🡪 Sends to YOLO 🡪 YOLO detects car in image 🡪 Calculates some maths 🡪 Python does further computation 🡪 we get coordinates 🡪 Folium get’s coordinates 🡪 Folium puts marker/points to marker on map 🡪 Car Located!

MORE BELOW!

Q. Why we are using Unity 3D?  
  
A. Simple answer is – Aukaat. We are too broke to afford a CCTV Camera. So this is how we will Demonstrate.

UNITY 3D 🡪 Yeh hamare world ka kaam Karega. I will create a 3D world including cars and other stuff in it.

Camera 🡪 Unity mein bhi Camera hota hai. It sees the 3D world. Kind of like how a real life CCTV Sees the world. Simple terms, FPS Games.

Now similar to what we did earlier. Camera in Unity gets an image by capturing images, let’s say it gets an image with car in it.  
  
Same process EXCEPT WE WILL NOT USE GeoPy. No need.  
  
So yes Folium will again detect a car even if IT’s a Game model. Don’t ask how, this is how AI works. And again some computational shit. We get co-ordinates. And we give them to Folium  
  
Now comes the thing. Folium uses Google Maps/OpenStreet Maps. AND OUR UNITY 3D world is FICTIONAL! It DOES NOT EXIST IN REAL LIFE. How we will accurately locate the car? Because those coordinates are meaningless. Because our 3D world doesn’t exist in real life!  
  
Well here is solution:  
  
Folium SUPPORTS Custom Maps. So if we just go back to our Unity 3D world, Take a screenshot of top down view of entire world, IT BECOMES OUR OWN MAP of our world!!!  
  
We just sync the coordinates of Custom Map and our Unity 3D world. We upload both coordinates AND the Custom Map to folium. Folium will put marker/locate the car EXACTLY on that spot of map as the car is in our 3D world.  
  
**Try to picture it, in our Real Life model, it’s same implementation.**  
  
Unity 3D – Our World

Game Camera – CCTV

Custom Maps – Real Life Map.

YOLO – Car Detection

Python – for Mathematical Calculation

Folium – For Visualization of Location on Map.  
  
The detection and location process in both Real Life AND Unity 3D demonstration is SIMILAR!!!!

I hope this helps.