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DISTANCE DETECTOR FOR COVID-19

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Abstract: ***The COVID virus is a pandemic disease where it is getting spread through direct contact with the victim person like handshake, cough and sneeze. The only way to prevent the spread of COVID-19 is just by maintaining Social Distancing .Being far from one another keeping distance from each other is the ultimate way to prevent the spread of this disease (at least until a vaccine is found)also keeps us safe. Hence by this implementation in the society makes to find the people who are moving close together finds them make sure they are not in social distance.***

Keywords: *Neural network, deep learning, machine learning, social distance, COVID,SOTA(state of the art), object detection, instance segmentation, keypoint detection, panoptic segmentation.*

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I INTRODUCTION

Social Distancing – the term that has taken the world by storm and is transforming the way we live. Social distancing has become a mantra around the world, transcending languages and cultures.

This way of living has been forced upon us by the fastest growing pandemic the world has ever seen – COVID-19. As per the World Health Organization (WHO), COVID-19 has so far infected almost 4 million people and claimed over 230K lives globally. Around 213 countries have been affected so far by the deadly virus.

The biggest cause of concern is that COVID-19 spreads from person to person through contact or if you're within close proximity of an infected person. Given how densely populated some areas are, this has been quite a challenge.

So this got me thinking – I want to build a tool that can potentially detect where each person is in real-time, and return a bounding box that turns red if the distance between two people is dangerously close. This can be used by governments to analyze the movement of people and alert them if the situation turns serious.

II DEEP LEARNING

It's a pertinent question. There is no shortage of machine learning algorithms so why should a data scientist gravitate towards deep learning algorithms? What do neural networks offer that traditional machine learning algorithms don't?

Another common question I see floating around – neural networks require a ton of computing power, so is it really worth using them? While that question is laced with nuance, here's the short answer – yes!

The different types of neural networks in deep learning, such as convolutionneural networks (CNN), recurrent neural networks (RNN), artificial neural networks (ANN), etc. are changing the way we interact with the world. These different types of neural networks are at the core of the deep learning revolution, powering applications like unmanned aerial vehicles, self- driving cars, speech recognition, etc.

Convolution Neural Networks, or CNN as they're popularly called, are the go-to deep learning architecture for computer vision tasks, such as object detection, image segmentation, facial recognition, among others. CNNs have even been extended to the field of video analysis!

If you are picking one deep learning architecture to learn and are not sure where to start, you should go for convolution neural networks. Deep learning enthusiasts and experts with CNN knowledge are being widely sourced in the industry.

Overview of Object Detection and Tracking

I can vividly recall my initial days learning computer vision. I often got confused between these two terms – Image Classification and Object Detection. I used both of these terms interchangeably assuming the idea behind them was similar. And, as a result, I kept getting confused between deep learning projects. Not ideal!

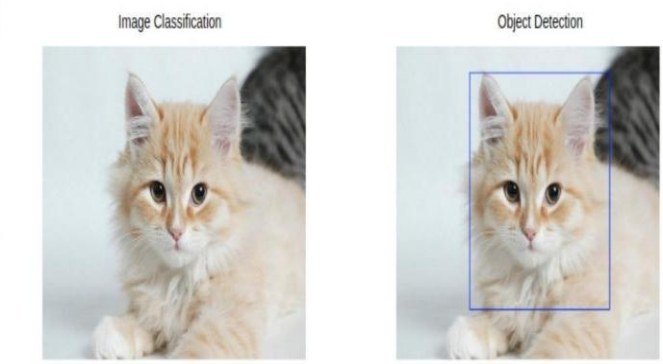
So, I will kick start the article by answering this perplexing question – are image classification and object detection one and the same?

Think about it – objects are everywhere! That's why Object Detection and Image Classification are very popular tasks in computer vision. They have a wide range of applications in defence, healthcare, sports, and the space industry.

The fundamental difference between these two tasks is that image classification identifies an object in an image whereas object detection identifies the object as well as its location in an image. Here's a classic example to understand this difference:

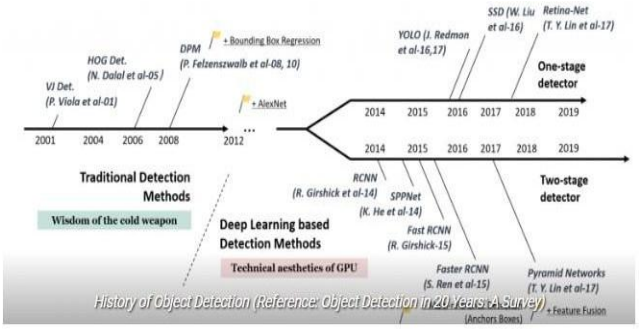
Well, then how is Object Tracking different from Object Detection?

Object Tracking and Object Detection are similar in terms of functionality. These two tasks involve identifying the object and its location. But, the only difference between them is the type of data that you are using. Object Detection deals with images whereas Object Tracking deals with videos.



Evolution of State-of-the-Art (SOTA) for Object Detection

Object Detection is one of the most challenging problems in computer vision. Having said that, there has been an immense improvement over the past 20 years in this field. We can broadly divide this into two generations – before and after deep learning



Sliding Window for Object Detection

The simplest approach to build an Object Detection model is through a Sliding Window approach. As the name suggests, an image is divided into regions of a particular size and then every region is classified into the respective classes.

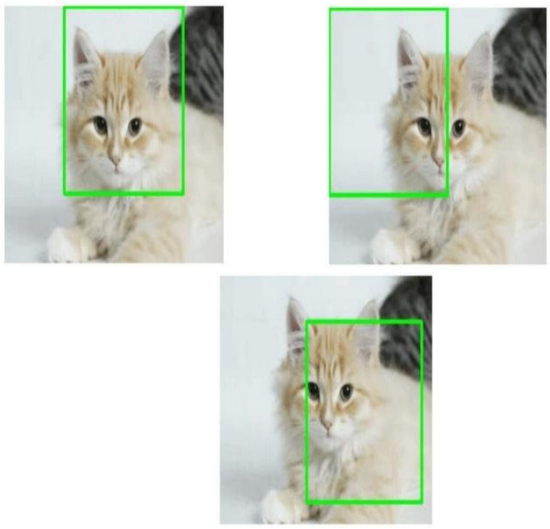
Bird's-eye shot

Overhead view is fairly synonymous with bird's-eye view but tends to imply a less lofty vantage point than the latter term. For example, in computer and video games, an "overhead view" of a character or situation often places the vantage point only a few feet (a meter or two) above human height. See top-down perspective.

Recent technological and networking developments have made **satellite images** more accessible. Microsoft Bing Maps offers direct overhead satellite photos of the entire planet but also offers a feature named **Bird's eye view** in some locations. The *Bird's Eye* photos are angled at 40 degrees rather than being straight down. Satellite imaging programs and photos have been described as offering a viewer the opportunity to "fly over" and observe the world from this specific angle.

a **bird's-eye shot** refers to a shot looking directly down on the subject. The perspective is very foreshortened, making the subject appear short and squat. This shot can be used to give an overall **establishing shot** of a scene, or to emphasize the smallness insignificance of the subjects. These shots are normally used for battle scenes or establishing where the character is. It is shot by lifting the camera up by hands or by hanging it off something strong enough to support it. When a scene needs a large area shot

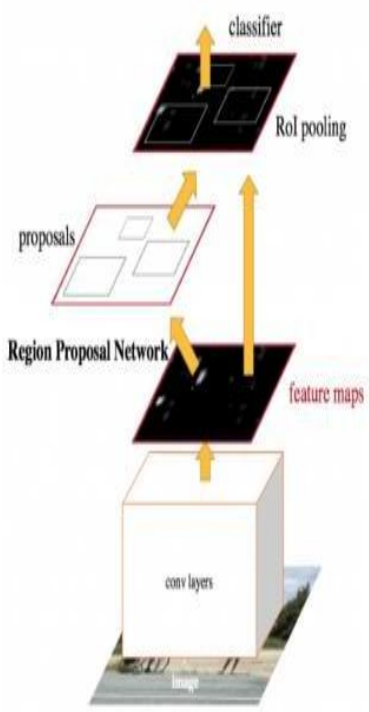
Bird's-eye shot



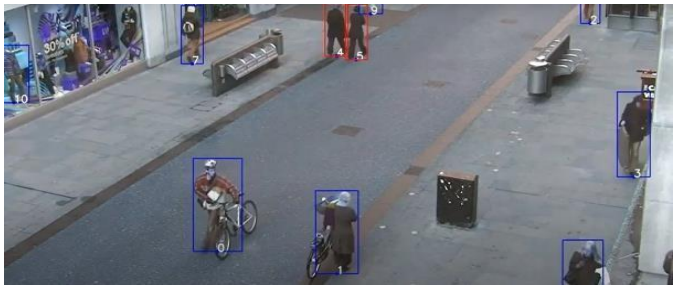
Faster R-CNN for Object Detection

Faster R-CNN replaces the exterior region proposal algorithm with a Region Proposal Network (RPN). RPN learns to propose the region of interests which in turn saves a lot of time and computation as compared to a Fast R-CNN

F a s t e



III OUT COME



This how the above figure show final out come the project

IV CONCLUSION

Stay SAFE (Stay Away From Everyone) to prevent the spread of the COVID-19 pandemic. In this paper, we represent the idea of how to detect the social distance. This is the one way the check the "how people maintaining social distance. Social distance is the best way to prevent the covid-19. Stay SAFE (Stay Away From Everyone) to prevent the spread of the COVID-19 pandemic be maintained social distance not emotional distance. Sota -cov-19 represent the idea of how to detect social distance, the best way to prevent the covid is by maintaining the social distance. We argue these with low cost tools. this enable the distance maintaining towards the people.

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