Procrastination Preventor using YOLO

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Abstract. According to research, procrastination is a frequent and damaging type of self-regulation failure. With so many deadlines and pressure to complete their work, students struggle with academic procrastination. As a result, even feeling unwell can delay coursework and affect academic progress. Not even Students do procrastinate as if they have to do something, employees and other people do the same. This delay affects many things. It affects our mental health and leads to stressful lives. To reduce this procrastination, a software model is developed called "Procrastination Preventer using YOLO" that helpsto avoid procrastination, reduce stress and help complete a specific task on time. This model also has a pomodoro timer which will also help in managing time efficiently. The intriguing thing about it is that, it has integrated text-to-speech technology. It means that in addition to notifying the user by displaying the text, the timer will also verbally announce it at the same time. This model is built using Python, Jupyter Notebook, OpenCV, Pomodoro timer, Text to Speech converter.

Keywords: Object Detection, YOLOv5, Pomodoro timer, Winsound, Text to Speech.

1. INTRODUCTION

Rekha et al.[1] proposed procrastination as a complex and persistent behavior that occurs in a variety of contexts, from the academic procrastination of students to the procrastination of employees at work, to the procrastination of people before going to bed, to the administrative behavior, and even to the delayed leadership decision-making in crises in international governance. In terms of academic study, procrastination has become increasingly popular and is the subject of in-depth investigation. Yan et al. [2] focused current study is primarily driven by two factors. On the one hand, the enormous frequency of procrastination and its visible impacts underline the necessity for in-depth research into this complicated issue. In particular, Chronic procrastination has been made worse by the exponential rise in accessibility of information and communications technologies, which includes problematic social media use, habit of mobile checking (ICTs) and smartphone addictions. On the other hand, a growing body of fundamental and landmark studies are being published in large quantities, creating the foundation for procrastination research to be conducted in the future by latecomers.

Social media and cell phones are two examples of technologies that could make people procrastinate more. It is concerning if using online technologies leads people to put off tasks longer, especially young adults and students. The time spend by young people online has been increased over the past ten years; in 2018, 16- to 24-year-olds in the UK spent an average of 27 hours per week online (OFCOM 2018). According to research, students spend up to 40% of their class time online on social media, which raises the possibility that this activity among students may overlap with offline responsibilities and activities. The demand for students to balance their use of social networking sites (SNS) (Abdulaziz Alblwi) with their academic studies has been recognized as a novel variation of the well-known self-control dilemma, which is the

conflictbetween an immediate low-priority impulse and a distal high- priority aim. It has been asserted that one particular form of procrastination is the use of social media in place of goal-related work. Procrastination linked to SNS may exhibit certain characteristics. For instance, it has been discovered that procrastination that is aided by Facebook is associated with higher stress upon the procrastinator's end.

This procrastination model can assist user in preventing these things from happening. It can identify the smartphone and other distracting objects in online classes for students and employees by using object detection technology. Any object that is detected will ring a buzzer to let the user know. To find a specific object, the model uses YOLOv5 with OpenCV. It also has other feature of a pomodoro timer which is used fortime management which in turn will reduce stressand anxiety in peoples.

Real-time object detection is a difficult task. Deep learning outperforms conventional target detection in object detection. Deep learning techniques include object detection algorithms that create region suggestion networks before classifying the objects. SPPnet, region-based convolutional neural networks, FastRCNN, Faster-RCNN, and others are examples of these. Region proposal networks are generated and classified simultaneously using regression object detection algorithms like SSD and YOLO. With YOLO, everything is simple. This technique first reduces the size of the input image to 448x448,then uses just one neural network toprocess the image, and finally, thresholds the detected objects based on the model's confidence.

Pomodoro technology is used in the procrastination- detecting model as well. A timer facility is constructed into this model. The timer will deliver directions such as "Now is the time for a break," as well ashow long the user must work for and when a break is permitted. It's intriguing since it includes text-to-speech technology. It means that, in addition to displaying the text, the timer will also announce it verbally at thesame time.

2. LITERATURE REVIEW

Rekha et al.[1] For computer vision, object detection is crucial. Object recognition is significantly impacted by issues with pictures such as noise, blurring, rotational jitter, etc. in the actual world. YOLO (You Only Look Once), a convolutional neural network-based system, can identify the objects in real time. The many YOLO network adjustments that have been made to increase object detection's effectiveness are discussed in this study.The YOLO architecture, YOLO network model for object detection, pedestrian detection, obstacle detection, and solder joint detection have all been reviewed in this study.

Yan et al.[2] There is a growing body of literature that discusses this complex subject, and procrastination is typically seen as a prevalent behavioural inclination. This article gives a bibliometric study that looks at the range of overviews and intellectual frameworks of relevant procrastination research in order toclarify the general perspective and stay current with new trends in the field.

Alblwi et al.[3] worked on procrastination by deliberating and putting off important activities and has a number of detrimental effects, including stress, health problems, and poor academic performance. The delivery of intelligent, real-time preventative and intervention tactics that help lessen procrastination can be done through social networking sites. This study examines the types, causes, and acceptability of procrastinationremedies on social media.

Dubey et al.[4] used Model YOU ONLY LOOKS ONCE to identify an object in a photo (YOLOv3). The image is recognised, and it is framed with the object's label name. To do searches, it makes use of Opencv,Python, and a variety of libraries. Three alternative scales of boxes are predicted by YOLOV3. A recent trail onthe model shows the YOLOv3 weight that is used sometime gave bad results and were not according to the desire output.

Isewon et al.[5] designed an application defined as a text-to-speech synthesizer which converts writtentext into spoken word. In this work, he created a simple application that reads aloud user- inputted text as synthesised speech and allows the user to save the file as an mp3. It intend to work on developing language- specific engines in the future to make text to speech technology more widely available.

Hasan et al.[7] paper's goal is to create an automated virtual reader. The entire bodywork includes Optical Character Recognition (OCR), Text-To-Speech (TTS), and a speaker. The processed image is then fed into Tesseract-OCR, which recognises the characters and uses TTS to convert the text to audio format. A programme called eSpeak is used to read out the audio formatted file, which is then output via a speaker. Text-to-speech conversion can also be done in Matlab, but it is not portable or user-friendly.

Ankita et al.[10] paper describes the technique of detecting any movement in front of the camera using Python is known as movement detection. I used Opencv2, Tracker, and the Win

Sound library in this article. It detects the person using opencv2 when the person moves or makes any movement. The tracker and win sound library will then be used to sound an alarm and count the person's movements. This project can be used as a surveillance camera or to track the movements of a person.

Amit A J et al.[19] The Pomodoro Technique, Peer-influence, gamification, and incentivization are customised and integrated into a single framework to help people stay on task and be as productive as possible. A mobile application called "ProScore" has been created using Flutter UI and Firebase to help people stay on task and be as productive as possible.

3. METHODOLOGY

As an advanced kind of image classification known as object detection, a neural network anticipates objects in a picture and uses bounding boxes to identify them. As a result, the phrase “object detection" stands for recognition and localization of objects in an image that fall into one of a number of pre-defined classifications. Given the numerous real-world scenarios in which tasks like detection, recognition, and localization are useful, object detection, also known as object recognition, is an important subfield in computer vision.

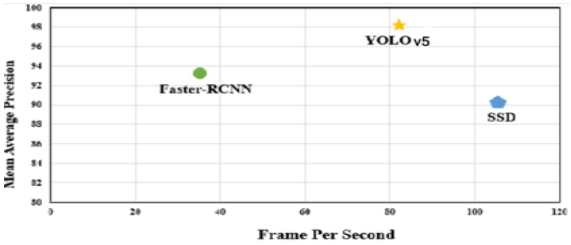

Figure 6 : Performance of Deep Learning Model

Fig 1: Mean Average Precision of 3 models

YOLOv5 vs. Faster R-CNN: Faster R-CNN is a popular object detection model that uses a two-stage approach to object detection. While Faster R-CNN has achieved good accuracy on object detection benchmarks, it is slower than YOLOv5 and requires more computation. YOLOv5 achieves similar or better accuracy than Faster R-CNN, but with much faster inference speed, making it more suitable for real-time object detection applications.

YOLOv5 vs. SSD: SSD (Single Shot MultiBox Detector) is another popular object detection model that uses a one-stage approach to object detection. While SSD is faster than Faster R-CNN, it is generally less accurate. YOLOv5 achieves similar or better accuracy than SSD, but with much faster inference speed, making it a good choice for real-time object detection applications.

3.1 YOLOv5 (You Only Look Once)

Zvornicanin et al.[6] explained that YOLO (You Only Look Once) is mainly used for object detection. YOLO Algorithm is widely used nowadays and on that only one model of Image Classification. The images are dividedinto N grids by the YOLOv4 method, with each grid having an equal-sized region of dimension N*N. These N grids are each in charge of finding and locating the thing they contain.

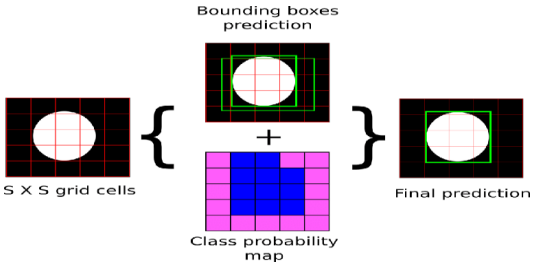

Fig. 2: Operating Principle of YOLO Algorithm

Figure 1 explains that the image is first divided into a 13x13 grid of 169 cells, the sizes of which depend on the dimensions of the input. The cell size for the 416x416 input size that we used in our studies was 32x32. The responsibility for estimating the variety of boxes in the image is therefore placed on each cell. For each bounding box, the network also predicts the arrogance that the bounding box actually encloses an object, and therefore the probability of the enclosed object being a specific class.

Due to numerous cells predicting the same object with varying bounding box predictions, it generates a lot ofduplicate predictions. YOLO uses Non-Maximal Suppression to deal with this issue. In non-maximal suppression, Yolo suppresses all bounding boxes with lower probability values.

YOLO looks at the likelihood scores associated with each option and chooses the one with the highest score.The bounding boxes with the highest probability of intersection over those union with the presently bounding box arethen suppressed. This step is repeated to obtain the final bounding boxes. It gives cutting-edge outcomes in thearea of object detection. YOLOv5 is more straight forward and consistent than other Deep Learning systems. It performs substantially quicker than other networks and requires much less processing resources than other topologies while maintaining equivalent outcomes.

The open-source project known as YOLOv5 is a collection of object recognition models and detectiontechniques depend on the YOLO model that was previously trained upon the COCO dataset. It is kept up-to-date byUltralytics and represents the organization's open-source investigation into the future of computer vision operations. Fig. 3 represents five models of YOLOv5. It was released with five different sizes: n represents extra small (nano) size model, s represents small size model, m represents medium size model, l represents large size model, x represents extra-large size model.The five models are identical in terms of the operations carried out, with the exception of the number of layersand parameters.

3.2 Comparison between YOLOv4 and YOLOv5

Figure 3 shows that YOLOv5 has better inference time than YOLOv4 and both models have same meanaverage precision

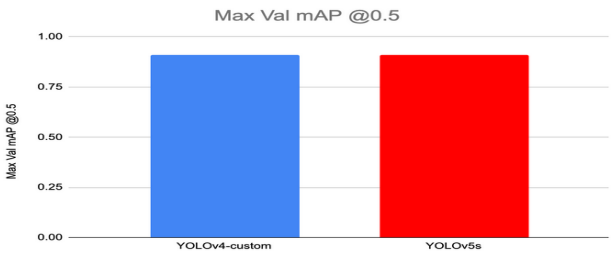

Fig 3. Mean avg. precision comparison

From these inferences we were able to arrive at a conclusion of selecting YOLOv5 model for object detection and classification.

3.3 Buzzer in Python

Python 3's winsound module offers a user interface for interacting with Windows' sound-playing technology. A beep with the set frequency and duration is played by the Beep function. A Runtime Error is thrown if the system is unable to play the beep sound on the speaker. The Beep function has the syntax:

Winsound.Beep(frequency,duration)

Parameters:

Frequency: It is a number that describes the frequency of the beep and ranges from 37 to 32767 Hertz.
Duration: The length of time the beep must play is measured in milliseconds.

Here “Winsound" library is a Python provides access to the sound-playing machinery built into the Windows operating system. It can be used to play a variety of sound formats such as WAV, AIFF, and MP3, among others. Once you have imported the library, you can use the various functions provided by it to play sounds, stop sounds, and control the volume and duration of the sound.

The PlaySound function is used to play a sound file or a system sound. You can specify the filename of the sound file or the alias of the system sound as the first parameter. The second parameter specifies the flags that control how the sound is played (such as SND_FILENAME for playing a sound file and SND_ALIAS for playing a system sound). The StopSound function is used to stop a currently playing sound. You can pass None as the first parameter to stop all currently playing sounds. The SetVolume function is used to set the volume of the sound. You can specify a value between 0 and 100 as the volume level. Note that the actual volume level may be limited by the hardware and software settings of the system.

Overall, the "winsound" library provides a simple way to play sounds in a Windows environment and can be useful for applications such as games and multimedia programs.

3.4 Pomodoro Timer with text to speech conversion

Python's pyttsx3 module converts text to speech. It works offline and is appropriate for Python versions 2 and 3, in contrast to competing libraries. The pyttsx3.init() factory method is used by an application to obtain a reference to a pyttsx3. Engine instance. The tool that turns the entered text into speech is fairly simple to use. The "sapi5" for Windows program provides the first voice, which is a female voice, and the second voice, which is a male voice.

A Timer implemented by pomodoro technique of taking a 5 min break after doing 25 min of work. But here the person can set the timer according to his need and after the timer starts it will continuously give a speech command to the person so that he can manage his things accordingly. The timer will deliver directions such as "Now is the time for a break," as well as how long you must work forand when a break is permitted. It means that in addition to notifying the user verbally when a notification is given, the timer also displays text at the same time. Time module is imported for this in python.

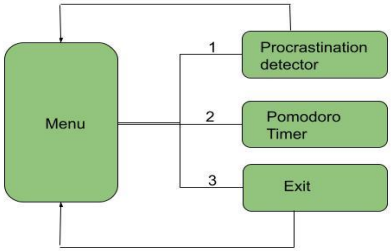

Fig 4: Flowchart of “Procrastination Preventor” Model

The fig.4 shows Procrastination preventor model, first gives a menu with 3 options to choose from 1. Distraction or Procrastination Preventor, 2. Pomodoro timer and last is the Exit option. The user will enter his choice and according to the choice the model will act further.

4. PSEUDO CODE FOR MODEL:

STEP 1: Show Menu Having 1)Distraction Detector 2)Pomodoro Timer 3)Exit
STEP 2: Take choice from User
STEP 3: IF Choice==1
Go to Step 4
ELSE IF Choice==2
Go to Step 8
ELSE IF Choice==3
Print “THANK YOU! HOPE YOU HAVE A PRODUCTIVE DAY

```
AHEAD”
    STEP 4: Capture Video through WebCAM
    STEP 5: IF Detection of CLASS=67
                PLAY Buzzer
    STEP 6: Repeat Step 4 until ‘q’ IS PRESSED
    STEP 7: IF ‘q’ key from keyboard is Pressed Go Back to Step 1
    STEP 8: Start POMODORO Timer
    STEP 9: COUNT to 25 minutes.
            IF ‘q’ is PRESSED
                JUMP to STEP 13
     STEP 10: IF COUNTER % 4 !=0
                INREASE COUNTER by 1 AND TAKE 5 Minutes BREAK .
          ELSE IF ‘q’ IS PRESSED
              JUMP to STEP 13
    STEP 11: IF COUNTER % 4=0
                    TAKE 30 MINUTES BREAK.
                ELSE IF ‘q’ IS PRESSED
                    JUMP to STEP 13
    STEP 12: ELSE
                    GO BACK to STEP 9.
                IF ‘q’ is PRESSED
                    JUMP to STEP 13
    STEP 13: TURN COUNTER to 0 AND GO BACK to STEP 1
```

5. RESULTS

By combining cutting-edge technology and efficient time management techniques, our project aims to address the problem of procrastination. To track the user's activity and give them feedback on their development, we specifically use YoloV5, a cutting-edge object identification technology. The user can then change their behaviour based on how much time they are actually spending on worthwhile activities versus time-wasting ones. In addition to YoloV5, we also employ the POMODORO approach, a tried-and-true method for managing your time that entails working in focused blocks of time—usually 25 minutes—followed by brief breaks. It has been demonstrated that using this strategy would significantly increase productivity and decrease procrastination.We also incorporate a buzzer as an auditory reminder to assist users in staying on task and avoiding distractions. This acts as a useful cue for the user to keep their attention on their tasks and prevent getting diverted by irrelevant pursuits. Overall, our project combines cutting-edge technology with effective time management strategies to provide a powerful tool for combating procrastination and increasing productivity. By utilizing YoloV5, the POMODORO technique, and a buzzer, we have created a unique and effective solution to this common problem.

When the Procrastination Preventor Model is run, a menu- driven option appears as shown in fig. 5 which consist of three options. First the Distraction/Procrastination preventor, Second Pomodoro timer and an Exit option. Whenever a man is doing work, he will run the model and choose from the options given.

If the user selects the first option of Procrastination preventor the model starts working. And as soon as the model captures any cellphone or electronic devices in your hand, the model will

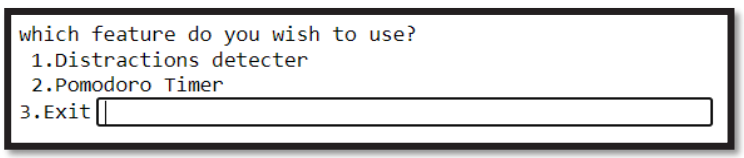

Fig 5. Menu option displayed on screen

consider the movement as a procrastination activity and immediately the Winsound module starts working, making the buzzer to rang. The buzzer will stop only when the cellphone is kept away.

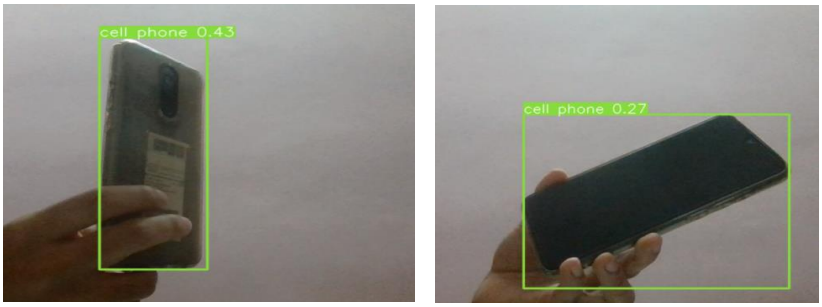

Fig 6. shows the successful detection of a mobile

Fig 7. shows the successful detection of a mobile device

The figures above illustrate the model detects the cellphone in the person's hand and then makes a grid around it by naming it as cellphone. The grid displays the confidence level of the detected cellphone. Apart from cellphone the model detects all things that distracts the person. It also detects the persons face and name it as person. Along with detecting the object it also beeps the buzzer to warn the user.

```
          xmin        ymin        xmax        ymax  confidence  class  \
0  469.210907  236.183716  591.627808  396.472229    0.705217     67

          name
0  cell phone
          xmin        ymin        xmax        ymax  confidence  class  \
0  397.155273  172.924255  508.680359  357.92749     0.674473     67

          name
0  cell phone
          xmin        ymin        xmax        ymax  confidence  class  \
0  405.633942  185.134857  512.174316  332.720673    0.783113     67

          name
0  cell phone
          xmin        ymin        xmax        ymax  confidence  class  \
0  406.404602  183.722351  512.804504  341.939514    0.737261     67

          name
0  cell phone
```

Fig 8. A table representing Cellphone detected every second with different confidence

In the above fig , 8 parameters are mentioned namely x min , y min , x max ,ymax confidence class respectively .xmin and ymin are the x- and y-coordinates of a bounding box that tightly encloses an object of interest within an image, respectively. xmax is the x- and y-coordinate of a bounding box that tightly encloses an object of interest within an image. A class is the category or kind of object that the object identification algorithm is trained to identify inside an image. The confidence score is commonly represented as a value between 0 and 1, with a higher value suggesting a greater degree of confidence in the prediction. Each class in object detection is usually represented by a unique label or identifier, such as a numerical index or a string of characters.

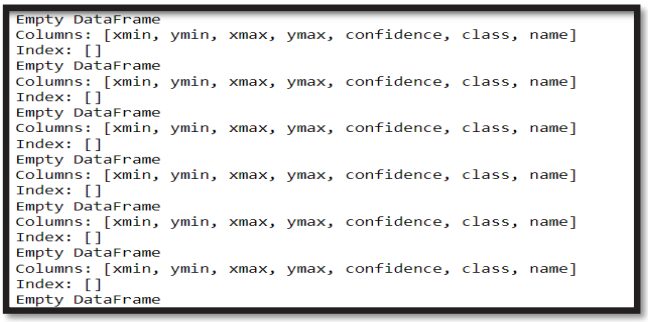

Fig 9: No detections shown when there is no cellphone

6. CONCLUSION

Numerous recurring pressures connected to academic obligations are experienced by students in secondary andhigher education settings. Previous studies have shown that academic stress can affect academic performance, motivation, and risk of dropping out of school. So a model is created that prevent students or any other ones toprevent their habit of procrastination. Mobile phone alerts frequently cause one to become distracted whileworking, thus in order to prevent this, this model will alert person with a buzzer sound as soon as it detects thephone in hand using object detecting technology. Additionally, there is an option to alert the user with a speechthat says things like "5 minutes left" or "Take a break." This can alsobe utilized when proctoring an exam sothat the invigilator can detect cheating as soon as the buzzer sounds. Both the features are completely suitablefor proctoring system. In future system can be made as a combined model where it can detect any electronic gadget that can lead to procrastination and any malpractice in examination. This system can be used as a proctor system in many institutes. Further adding to the future scope of this project, now YOLOv7 model has been introduced recently.It is one of the fastest object detection algorithms that exist today. It gives more accuracy than the previous versions.

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