**1.Topic: A novel approach for object detection in remote sensed images**

**Review:**  
The study of optical remote sensing pictures has drawn more and more interest in recent years. Convolutional neural network (CNN)-based techniques like You Only Look Once (YOLO) and Faster R-CNN have significantly advanced object recognition, one of the most difficult jobs in the field of remote sensing. However, simply applying these generic object detection algorithms to the remote sensing object detection typically produces subpar results due to the complexity of backgrounds and the peculiar item distribution. A very effective and reliable framework based on YOLO is suggested to address this issue. We create VaryBlock, a component of the design, and incorporate it to help mitigate some of the information loss that results from downsampling. Additionally, various methods are used to ease the task

**References[1]:**  
Zhang, Heng, et al. "VaryBlock: a novel approach for object detection in remote sensed images." Sensors 19.23 (2019): 5284.

**2.Topic: Real-Time Object Detection with Pre-eminent Speed and Precision using YOLOv4**

**Review:**  
Object identification is a computer vision method that has captivated the globe with its exceptional ability to localise and identify items. It builds bounding boxes around recognised items and labels them correctly. item detection is more complex than classification since it recognises not only the item but also its location in the picture. YOLO is a well-known method for precise and fast detection. YOLO (You Only Look Once) is an open-source, dependable real-time object identification system that can recognise several items in a single frame. Furthermore, it recognises items faster and more accurately than existing recognition systems. It is one of the most adaptive computer vision algorithms due to its ability to analyse 45 frames per second and estimate up to 9000 and more seen and unseen classes of object.

**References[2]:**  
Pattanshetti, Shraddha Sanjeev, and Shabana Imam Nivade. "Real-Time Object Detection with Pre-eminent Speed and Precision using YOLOv4." International Journal of Research in Engineering, Science and Management 4.7 (2021): 26-31.

**3.Topic: Comparisons between the latest deep-learning methods YOLOV3 and SSD**

**Review:**  
A computer vision technology that has mesmerized the world with its excellent ability to locate and detect objects is object recognition. It draws jump boxes around detected objects and marks them accurately. Object detection is more difficult than classification because it not only detects the object, but also the location of the object in the image. YOLO is a widely known algorithm for accurate and fast detection. YOLO (Youonly Look Once) is an open-source and reliable real-time object recognition algorithm that can recognize multiple objects in a single frame. In addition, it recognizes objects faster and more accurately than other recognition systems. It is one of the best and most adaptive computer vision algorithms because it can process 45 frames per second and estimate up to 9000+ classes of seen and unseen objects. It can also be seen that YOLO performs faster than RCNN due to its basic architecture. Similar to R-CNN algorithms that use regions to delineate image entities, YOLO instead uses a neural network over the entire image to predict bounding boxes and their probabilities. YOLOv4 is better than YOLOv3 in terms of sufficient speed and accuracy of object detection.

**References[3]:**

Park, Ji-Hoon, Hye-Won Hwang, Jun-Ho Moon, Youngsung Yu, Hansuk Kim, Soo-Bok Her, Girish Srinivasan, Mohammed Noori A. Aljanabi, Richard E. Donatelli, and Shin-Jae Lee. "Automated identification of cephalometric landmarks: Part 1—Comparisons between the latest deep-learning methods YOLOV3 and SSD." The Angle Orthodontist 89, no. 6 (2019): 903-909.

**4.Topic:** **Recognition of Human Face Regions under Adverse Conditions - Face Masks and Glasses - In Thermographic Sanitary Barriers through Learning Transfer from an Object Detector**

**Review:**  
The COVID-19 pandemic has negatively affected people's lives and the economy in many countries, causing disruptions in health, education, transportation and other sectors. Multiple countries have introduced sanitary barriers at airports, bus and train stations, company gates, and other common facilities to identify patients with viral symptoms to prevent the spread of viruses disease Since fever is one of the most common signs of illness, it requires equipment measure that the temperature of the skin (body surface) has increased. Thermal camera, also known as a thermal imager is one such device used to measure temperature. It uses a technique known as infrared thermography and is a non-invasive, fast and objective tool. A machine was used in this study learn transfer with You Only Look Once (YOLO) to identify the hottest temperatures in the regions regions of interest (ROI) of human faces in thermal images, allowing fever detection condition in humans. Algorithms identify areas of interest in thermographic images such as eyes, forehead and ears before analyzing the temperatures of these areas. Developed software achieved excellent results in identifying observed objects of interest, showing sufficient maximum temperature in each region of interest and select the maximum correctly temperature between them.

**References[4]**:

da Silva, Joabe R., et al. "Recognition of human face regions under adverse conditions—face masks and glasses—in thermographic sanitary barriers through learning transfer from an object detector." Machines 10.1 (2022): 43.

**5.Topic: A Suspicious Multi-Object Detection and Recognition Method for Millimeter Wave SAR Security Inspection Images Based on Multi-Path Extraction Network**

**Review:**

There are several major challenges in detecting and identifying multiple hidden objects from millimeter SAR surveillance images: uneven object clarity, similar objects, and complex background noise. To solve these problems, a multi-objective suspect detection and identification method based on Multi-Path Extraction Network (MPEN) is proposed. In MPEN, You Only Look Once (YOLO) v3 is used as the basic network, after which MPFP (Multi-Path Feature Pyramid) module and modified residual block distribution are proposed. MPFP is designed to print layers of deep network functions separately. After that, the distribution of residual blocks is changed to improve the ability of the shallow mesh to capture details to make it easier to distinguish similar objects. To verify the effectiveness of the proposed method, millimeter SAR images from the laboratory's self-developed security control system are used to investigate detection and detection of multiple targets. The detection rate (probability of target detection) and average false alarm (probability of error detection) of our method are 94.6% and 14.6%, respectively. The average multi-object detection accuracy (mAP) is 82.39%. Compared with YOLOv3, our method show better performance in detecting and identifying similar objects.

**References[5]:**

Yuan, Minghui, et al. "A Suspicious Multi-Object Detection and Recognition Method for Millimeter Wave SAR Security Inspection Images Based on Multi-Path Extraction Network." Remote Sensing 13.24 (2021): 4978.

**6.Topic: YOLOv5 with ConvMixer Prediction Heads for Precise Object Detection in Drone Imagery**

**Review:**  
The effectiveness of object detection technology using unmanned aerial vehicles (UAVs) is unprecedented due to their maneuverability. This capability has facilitated the use of object sensing UAVs in many important real-world applications. Additionally, more efficient and accurate object detection techniques are being researched and developed for use in UAV applications. However, object detection in UAVs presents challenges that are not typical for general object detection. First, because UAVs fly at different altitudes, the size of objects imaged by UAVs varies significantly, making the task at hand more difficult. Second, the motion of the UAV can blur the captured image. To overcome these challenges, we provide a You Only Look Once v5 (YOLOv5)-like architecture with ConvMixers in the prediction head and an additional prediction head to handle small objects. The proposed architecture has been trained and tested on the VisDrone 2021 dataset and the obtained results are comparable to existing state-of-the-art methods.

**References[6]:**

Baidya, Ranjai, and Heon Jeong. "YOLOv5 with ConvMixer Prediction Heads for Precise Object Detection in Drone Imagery." Sensors 22.21 (2022): 8424.

**7.Topic:** **YOLO-Based Object Detection for Separate Collection of Recyclables and Capacity Monitoring of Trash Bins**

**Review:**

In this study, we use a webcam and Raspberry Pi's real-time object recognition "You Only Look Once" (YOLO) to segregate and collect recyclables, and to identify and classify these recyclables into the correct category. Describes the development of Trash. The sorting results will rotate the bin lid to reveal the correct bin compartment for the user to dump their trash. We evaluated the performance of the YOLO model and measured its accuracy, which was 91% under optimal computing conditions and 75% when deployed on a Raspberry Pi. Several IoT hardware components have been implemented, such as an ultrasonic sensor to measure the volume of the trash can and a GPS to determine the coordinates of the trash can, enabling controlled volume monitoring by the Arduino Uno. Capacity and GPS information are uploaded to Firebase database via ESP8266 WiFi module. To provide capacity monitoring capabilities, uploaded trash capacity information is displayed in the mobile application in a bar-level format developed with MIT App Inventor, allowing users to take quick action when needed . The system proposed in this study is intended to be implemented in rural areas where it could potentially solve the problem of recyclable waste segregation.

**References[7]:**

Wahyutama, Aria Bisma, and Mintae Hwang. "YOLO-based object detection for separate collection of recyclables and capacity monitoring of trash bins." Electronics 11.9 (2022): 1323.

**8.Topic : Voice assisted real time object detection using YOLO V4 Tiny algorithm for visually challenged**

**Review:** Visual impairment is a problem that often worsens everywhere. World Health Organization around 284 million people worldwide suffer from near or far vision problems. The aim of the planned work is to create an Android application for the blind that works on a smartphone. and a white stick. As the main difference between the proposed and current system, we use state-of-the-art technology "You only look once: unified, real-time object detection". In comparison for other algorithms, YOLOv4-tiny works twice as fast. Acknowledge the real issues ahead for the visually impaired in real time, a small YOLOv4 algorithm was trained on both the regular dataset and COCO dataset. Then determine how far that target is from the person and repeat the sound output. The The camera is initialized using the OpenCV library, after which it starts taking pictures and feeding them system Otherwise, for this project we use Python 3. Then the system uses YOLOv4 tin An algorithm trained on both the regular dataset and the COCO dataset to identify and measures the distance between objects in front of the user. Then, speech to speech is used for translation identified objects as sound segments. Our system produces an audio segment that says can now visualize objects around him using this information. The proposed method protects the user even against hitting nearby objects, keeping him safe from harm. An Android-based application is available to represent the entire system.

**References[8]:**

Nazir, Z. A. E. E. M., Hamid, K., waseem Iqbal, M., & Muhammad, H. (2023). VOICE ASSISTED REAL-TIME OBJECT DETECTION USING YOLO V4-TINY ALGORITHM FOR VISUAL CHALLENGED. vol, 56, 2023.

**9.Topic : Object Detection via Gradient-Based Mask R-CNN Using Machine Learning Algorithms**

**Review:**

Object detection has received much research attention in recent years because it is closely related to video analysis and image interpretation. Object detection in images and videos is a fundamental task and is considered one of the most challenging problems in computer vision. Many machine learning and deep learning models have been proposed in the past to solve this problem. In the current scenario, the detection algorithm must compute from start to finish in the shortest possible time. This paper proposes a method called GradCAM-MLRCNN, which combines gradient-weighted class activation mapping (Grad-CAM) for localization and regional convolutional neural network (Mask R-CNN) for object detection and machine learning algorithms. In our proposed method, images and masks that show where objects are located in the image are used to train the network. In most localization networks, a bounding box is reduced around the region of interest. Also, like any classification task, the multiclass log loss during training is minimal. This model improves computing time and speed and efficiency that accurately detects objects in images by comparing state-of-the-art machine learning algorithms such as decision tree, Gaussian algorithm, k-means clustering, k-nearest. neighbor and logistic regression. Among these methods, we found that logistic regression performed well with 98.4% precision, 99.6% recall ratio and 97.3% accuracy for ResNet 152 and VGG 19. In addition, we proved the suitability of our proposed model using the chi-square statistical method and showed that our solution can achieve high accuracy while maintaining fair recovery.

**References[9]:**

Xavier, Alphonse Inbaraj, et al. "Object Detection via Gradient-Based Mask R-CNN Using Machine Learning Algorithms." Machines 10.5 (2022): 340.

**10.Topic: A Literature Review of Object Detection using**

**YOLOv4 Detector**

**Review:** Object recognition is an advanced form of image classification where a neural network predicts the objects in the image and shows them as interfaces. Compared to the approach used by object detection algorithms before YOLO, YOLO proposes the use of an end-to-end neural network to identify classifiers. bounding box predictions and class probabilities simultaneously. Object recognition does not only involve classification and recognition objects in the image, but it also involves locating those objects and drawing bounding boxes around them. Its application includesin areas such as facial recognition, vehicle, autonomous vehicle and pedestrian detection on the streets

**References[10]:**

Saini, S. Bhupinder Singh, et al. "A Literature Review of Object Detection using YOLOv4 Detector."

Saini, S. Bhupinder Singh, Shamsher Tiwari, Naman Gupta, and S. Jaishree. "A Literature Review of Object Detection using YOLOv4 Detector."