e-ISSN:2582-7219

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 7, Issue 5, May 2024

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.521

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.521| Monthly Peer Reviewed & Referred Journal |

| Volume 7, Issue 5, May 2024 |

| DOI:10.15680/IJMRSET.2024.0705120 |

Implementation towards FindItPro: A WIFI Object Tracker

Pawar Ganesh[1], Pawar Tushar[2], Kate Pravin[3], Prof. Pachhade R.C.[4]

U.G. Student, Department of Computer Engineering, Vishwabharati Academy's COE, Ahmednagar, Maharashtra, India[1,2,3]

Lecturer, Department of Computer Engineering, Vishwabharati Academy's COE, Ahmednagar, Maharashtra, India[4]

ABSTRACT: Humans are complex entity. Many times, they forget little simple things. One of such things is loose objects in nearby place. People might forget the keys where they have kept or remote to the TV in the very same room. People spend an enormous amount of time and effort looking for lost objects. To help remind people of the location of lost objects, various computational systems that provide information on their locations have been developed. We propose novel method to use IoT to search and detect these small objects in limited area. The objects are detected through use of microchip and the user gets reply through buzzer or led lights to locate these objects. The system helps to save time and ease mind after the objects are found. On large scale the idea can utilized in warehouse to detect the specific racks. In pharma the same idea can be used to detect the specific box of medicines.

KEYWORDS: microcontroller, IoT, ESP2866 , Android Application, Loss of objects, Satisfaction

I. INTRODUCTION

Technology has helped humans to improve their lifestyle to a very great extent. Automation of things through IoT has improved every aspect of lifestyle from ordering things online to washing clothes through machine. The longevity of food is increased by refrigerators and the entertainment is brought to doorstep with help of television. Everything is created by human and for human and but again humans are complex entity. Many times, they forget little simple things. One of such things is loose objects in nearby place. They might forget the keys where they have kept or remote to the TV in the very same room. The objects are in front of them but due to some reason at that very moment they are not to find it. This increases the anxiety as well loss of patience to find the thing. Humans spend an enormous amount of time and effort looking for lost objects. To help remind them of the location of lost objects, various computational systems that provide information on their locations have been developed in recent years. The existing research factor for same is working in image processing where the person hangs the camera in his neck and captures view of whole room to find the lost objects. However, prior systems for assisting people in finding objects require users to register the target objects in advance. This requirement imposes a cumbersome burden on the users, and the system cannot help remind them of unexpectedly lost objects. We propose novel method to use IoT to search and detect these small objects in limited area. The objects are detected through use of microchip and the user gets reply through buzzer or led lights to locate these objects. The system helps to save time and ease mind after the objects are found. On large scale the idea can utilized in warehouse to detect the specific racks. In pharma the same idea can be used to detect the specific box of medicines., etc.

Paper is organized as follows. Section I gives the introduction topic with need for system and overall use over world. Section II gives the related work till now in this field for the system. Section III gives the architecture for the system and inclination of more facilities included in the system. Section IV discusses the algorithm implemented for the system while Section V presents simulated results with setup. Section VI concludes with conclusion about the system.

II. RELATED WORK

1. Computational Systems for Finding Lost Objects :
The Various types of sensors, such as wireless tags ,Bluetooth, stationary cameras, and wearable cameras, have been studied for systems to assist users in finding lost objects. Active and passive radio-frequency identification (RFID) tags are frequently deployed by attaching them to target objects. While RFID tags are effective in indoor environments, they cannot locate an object when taken outside the search range. To expend the search range, a combination of Bluetooth and GNSS are adopted in some commercial products . Although these systems can provide the angle and distance from the

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.521| Monthly Peer Reviewed & Referred Journal |

| Volume 7, Issue 5, May 2024 |

| DOI:10.15680/IJMRSET.2024.0705120 |

tag, their guidance is less intuitive and attaching an external tag to each object will be a major bottleneck to track a large number of objects. Alternatively, camera-based systems have the merit of not requiring external sensors attached to objects.However, stationary cameras do not solve the problem of the search range and are weak against occlusions when objects are hidden by other entities. Wearable camera-based systems mitigates these problems by capturing images from the user's viewpoint. Since the camera moves along with the user, the system captures a close-up of the surrounding environments and it can be carried, significantly expanding the search range. The system consists of headmounted RGB and infrared cameras for capturing pre-registered objects. It assists in object search by showing the last scene of the target object detected. The same strategy is adopted in this work

2. Camera-based systems for Mitigating Memory Problem:

Camera-based systems are used for mitigating memory problems other than losing objects since visual information offers a large amount of information better than textual information [5]. Hodges et al. [13] proposed a wearable camera based system called SenseCam, which takes wide-angle pictures periodically (e.g., one shot every 30 s) to remind users of past events. Li et al. [9] proposed FMT, a wearable memory-assistance system to remember the state of objects (e.g., the last time the plant was watered). While their hardware configuration is similar to ours in using neck-mounted wearable cameras, they aim to recall past interactions of a few numbers of daily-used objects, asking users to attach AR markers to each object. In contrast, GO-Finder aims to expand the range of objects which could be searched for by removing the registration operation .

3. Objects and Hands in First-Person:

Videos GO-Finder executes hand-held-object detection and grouping to discover objects appearing in first-person videos. Discovering objects in first-person videos is a difficult problem since object categories appearing in daily life are massive, diverse, and individualdependent. To this end, various methods have been proposed to discover objects in first-person videos [1, 3]. Lee et al. [6] developed a model to discover important object regions using multiple firstperson saliency cues. Lu et al. [10] proposed an object clustering-based method for personal-object discovery. Their system involves object-scene distribution based on the assumption that personal objects appear in different scenes while non-personal objects typically remain in similar scenes. Since objects appearing in first-person videos are typically handled by hands, hand information is used to improve object detection. Lee et al. [7] proposed using hands as a guide to identify an object of interest from a photo taken by people with visual impairment. Shan et al. [12] collected a large-scale dataset of hand-object interaction along with annotated bounding boxes of hands and objects in contact with each other. Their proposed system can detect hands and objects in contact with each other from an image. Our aim is not only detecting hand-held objects but also to discover hand-held-object instances from first-person videos, which reduces the number of candidates to be registered.

III. PROPOSED WORK

The proposed system utilizes the Internet of Things (IoT) technology to locate and detect small objects within a limited area. The objects are equipped with microchips, enabling the user to receive feedback through buzzers or LED lights, facilitating the process of locating the desired items. This system aims to save time and provide peace of mind once the objects are found.

A. The Proposed System

1. The system is entirely dependent on IoT technology.
2. The objects are tagged with ESP8266 WiFi modules.
3. Each object has a dedicated buzzer and LED to indicate its position.
4. The system can be operated through a smartphone application.
5. A separate controller device is used to control and manage specific objects.

B. System Requirements.

Software Specifications:

- **Android Studio:** An integrated development environment (IDE) for developing Android applications.
- **Java:** A programming language used for developing the system's software components.
- **Windows Operating System:** The recommended operating system for development and testing purposes.

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.521| Monthly Peer Reviewed & Referred Journal |

| Volume 7, Issue 5, May 2024 |

| DOI:10.15680/IJMRSET.2024.0705120 |

Hardware Descriptions:

1. ESP8266 WiFi Module: The ESP8266 WiFi module is a low-cost, high-performance system-on-chip (SoC) designed for Internet of Things (IoT) applications. It integrates a 32-bit microcontroller, WiFi transceiver, and various digital peripherals. This module allows the tagged objects to connect to a WiFi network and communicate to the Controller and smartphone application.

Fig.1 ESP8266 WIFI Module

2. Smartphone: A modern smartphone serves as the user interface for the system. Users can install the dedicated application on their smartphones to initiate object location requests and receive feedback of the tagged items.

Fig. 2 Android Smartphone

3. LED and Buzzer: Each tagged object is equipped with an LED and a buzzer. The LED provides visual feedback by illuminating when the object is detected, while the buzzer emits an audible alert, helping users locate the object more easily.

Fig. 3 Led and Smartphone

With this system, users can conveniently locate misplaced or lost objects within a limited area by utilizing the power of IoT technology and a smartphone application. The ESP8266 WiFi modules enable the objects to communicate and the LEDs and buzzers provide visual and audible cues for efficient object detection.

4. Custom PCB Design for ESP8266 Object Tag

The custom PCB will be designed to integrate the essential components required for the object tag, including the ESP8266 module, a battery or power management circuit, an LED, and a buzzer. By designing a dedicated PCB, the

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.521| Monthly Peer Reviewed & Referred Journal |

| Volume 7, Issue 5, May 2024 |

| DOI:10.15680/IJMRSET.2024.0705120 |

size can be significantly reduced compared to using the larger ESP8266 development board, which includes unnecessary components for this application.

The PCB will be designed using a computer-aided design (CAD) software for electronics, such as Altium Designer, KiCad, or Eagle. The design process involves creating schematics and layouts, ensuring proper component placement, routing traces, and defining the PCB dimensions.

Fig 4. Customised PCB of Tag

By designing and manufacturing a custom PCB for the ESP8266 object tag, the overall size of the device can be significantly reduced, making it more suitable for tagging and locating small objects. The integrated components, such as the LED and buzzer, will provide visual and audible feedback, enhancing the user experience and improving the efficiency of the object detection system.

A. System Architecture

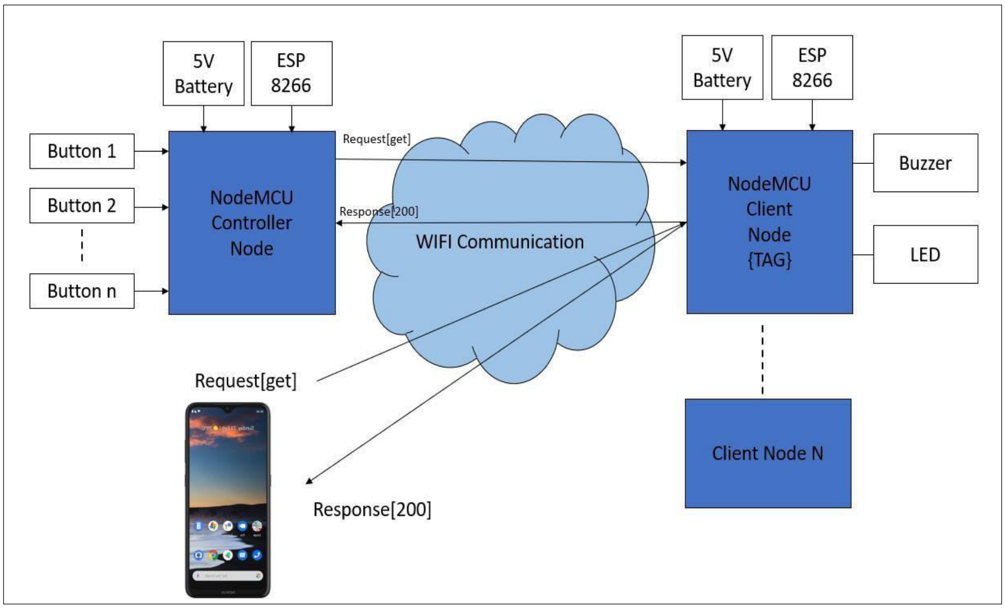


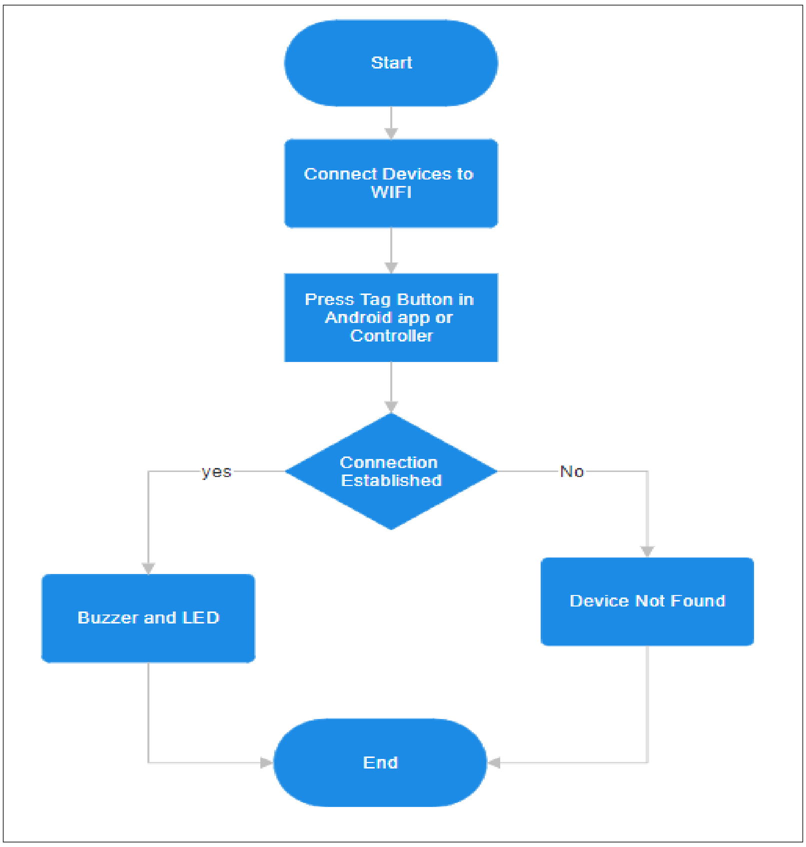
Fig 4: System Architecture

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.521| Monthly Peer Reviewed & Referred Journal |

| Volume 7, Issue 5, May 2024 |

| DOI:10.15680/IJMRSET.2024.0705120 |

IV. ALGORITHM USED



V. SIMULATION RESULTS

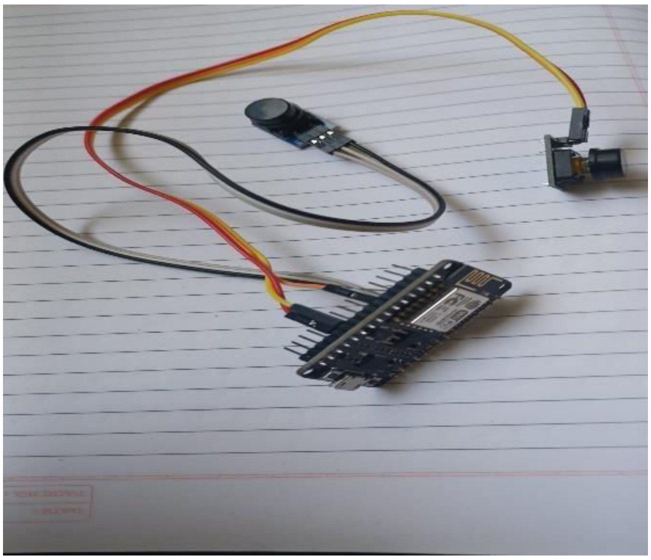


Fig2: Controller with Dedicated buttons

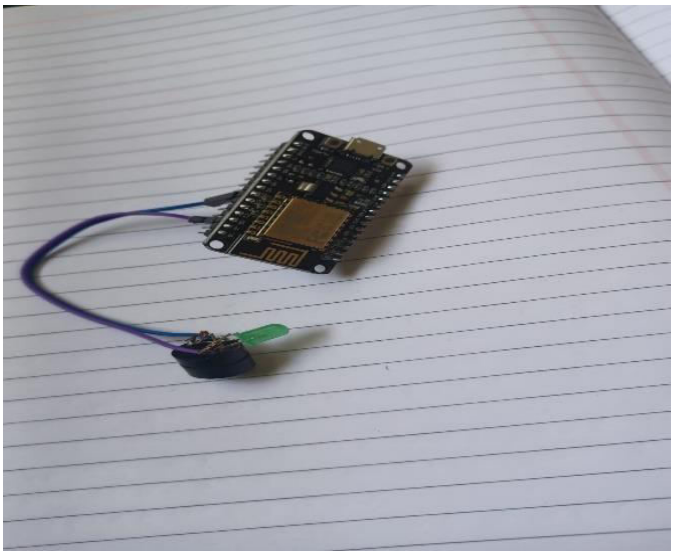


Fig3: Node MCU with LED and Buzzer

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.521| Monthly Peer Reviewed & Referred Journal |

| Volume 7, Issue 5, May 2024 |

| DOI:10.15680/IJMRSET.2024.0705120 |

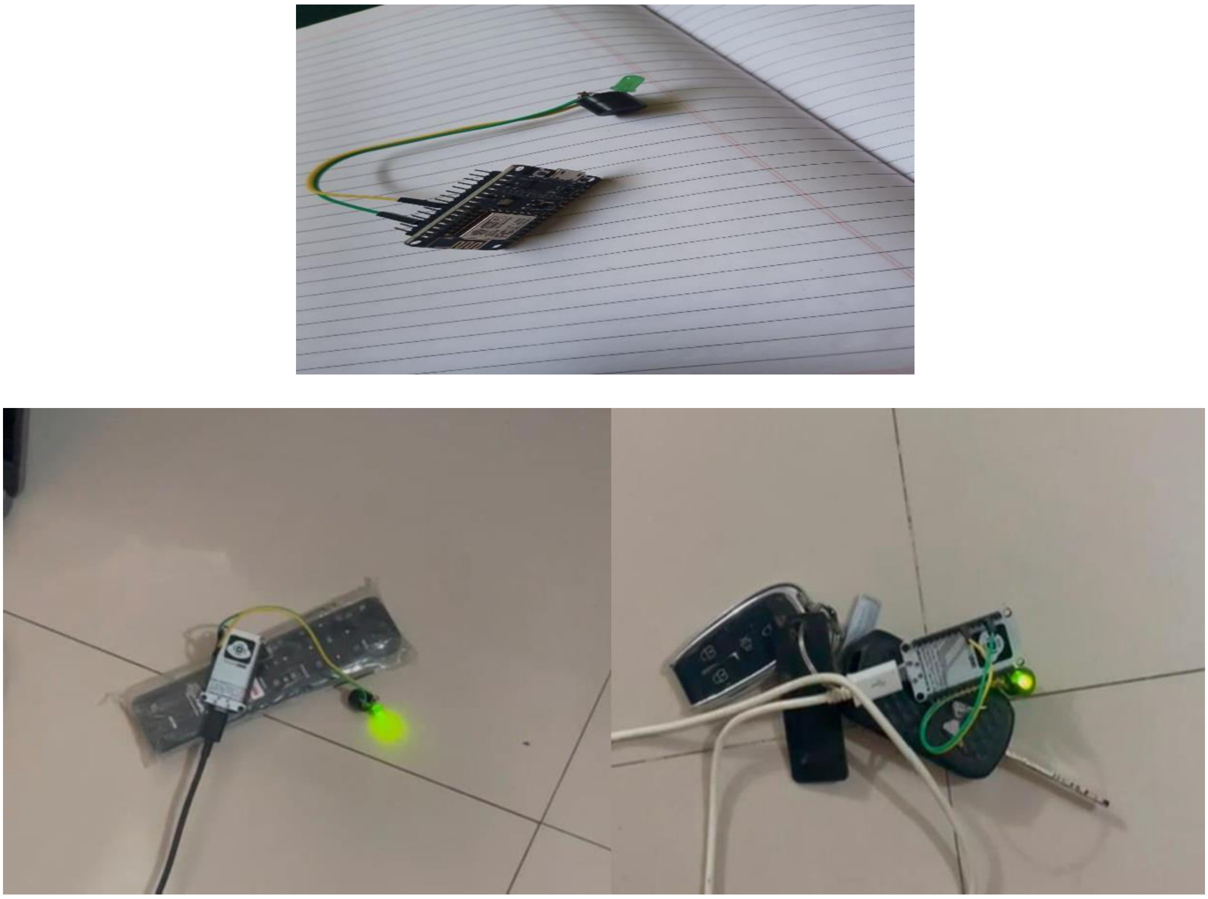


Fig4: Tags To find Device

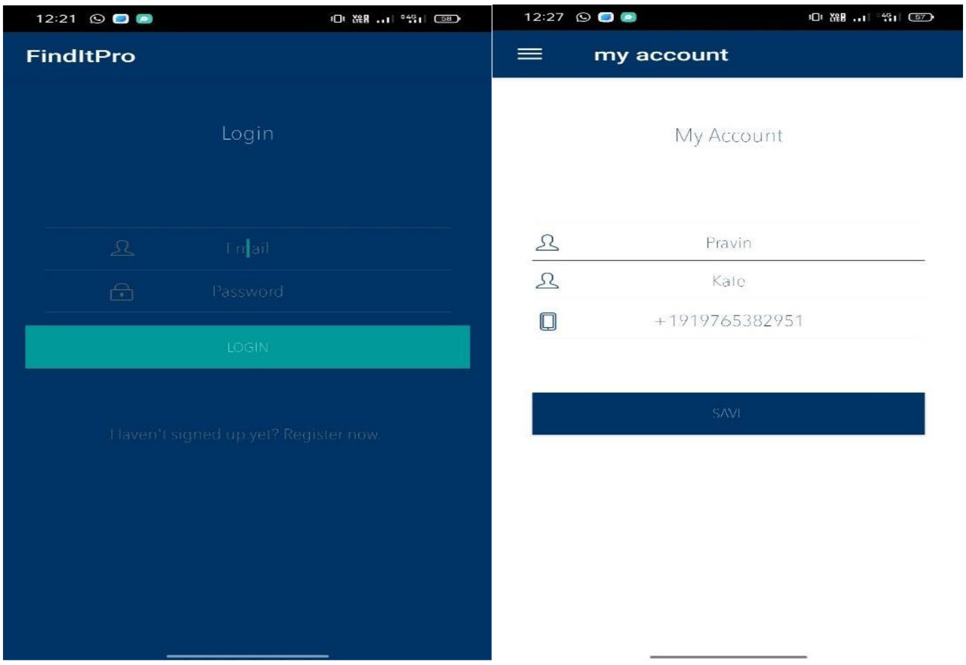


Fig5: Android Application Screenshot

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.521| Monthly Peer Reviewed & Referred Journal |

| Volume 7, Issue 5, May 2024 |

| DOI:10.15680/IJMRSET.2024.0705120 |

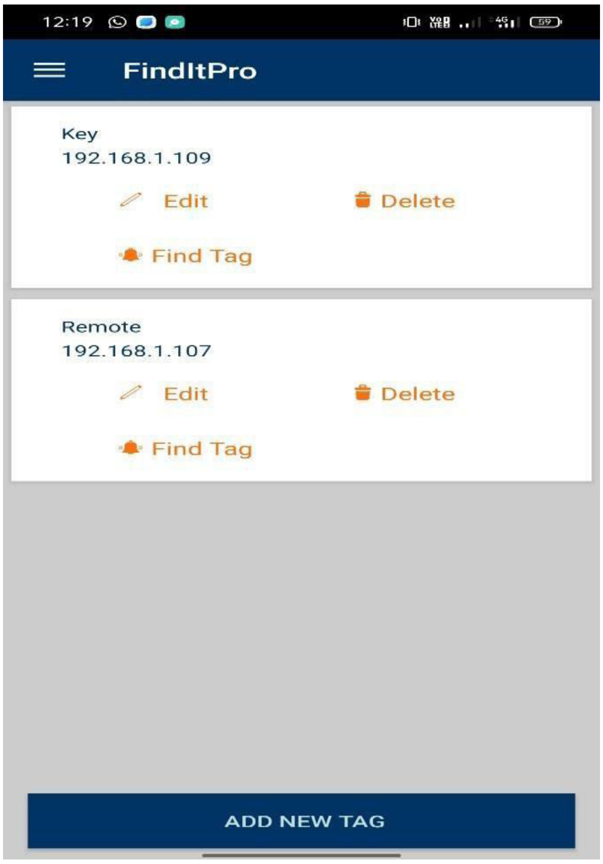


Fig6: Device list on application

VI. CONCLUSION

We have Implemented for the system through the existing system of camera based and handheld devices. In the system the object is searched in specific area where the system is setup. The minimum distance is evaluated. The object is detected by buzzer sound or Led flashing. The range for finding lost objects can be increased. The same prototype can be used for searching physical things in big entities like medicine in medicine warehouse. Etc.

REFERENCES

1. Gedas Bertasius, Hyun Soo Park, Stella X Yu, and Jianbo Shi. 2017. Unsupervised learning of important objects from first-person videos. In Proc. IEEE International Conference on Computer Vision. 1956–1964.
2. Luca Bertinetto, Jack Valmadre, Joao F Henriques, Andrea Vedaldi, and Philip HS Torr. 2016. Fully-convolutional siamese networks for object tracking. In Proc. European Conference on Computer Vision Workshops. 850–865.
3. Dima Damen, Hazel Doughty, Giovanni Maria Farinella, Sanja Fidler, Antonino Furnari, Evangelos Kazakos, Davide Moltisanti, Jonathan Munro, Toby Perrett, Will Price, et al. 2018. Scaling egocentric vision: The epic-kitchens dataset. In Proc. European Conference on Computer Vision. 720–736.
4. Kaiming He, Xiangyu Zhang, Shaoqing Ren, and Jian Sun. 2016. Deep residual learning for image recognition. In Proc. IEEE Conference on Computer Vision and Pattern Recognition. 770–778.
5. Tile Inc. 2017. Find your keys, Wallet & phone with Tile's app and Bluetooth tracker device | Tile. https://www.thetileapp.com/en-eu/. archived: 2017-12-06.
6. Kyungjun Lee and Hernisa Kacorri. 2019. Hands holding clues for object recognition in teachable machines. In Proc. ACM CHI Conference of Human Factors in Computing Systems. 1–12.
7. Kyungjun Lee, Abhinav Shrivastava, and Hernisa Kacorri. 2020. Hand-priming in object localization for assistive egocentric vision. In Proc. IEEE Winter Conference on Applications of Computer Vision. 3422–3432.
8. Franklin Mingzhe Li, Di Laura Chen, Mingming Fan, and Khai N Truong. 2019. FMT: A wearable camera-based object tracking memory aid for older adults. Proc. ACM on Interactive, Mobile, Wearable and Ubiquitous

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.521| Monthly Peer Reviewed & Referred Journal |

| Volume 7, Issue 5, May 2024 |

| DOI:10.15680/IJMRSET.2024.0705120 |

Technologies 3, 3, 1–25.

9. Yin Li, Miao Liu, and James M Rehg. 2018. In the eye of beholder: Joint learning of gaze and actions in first person video. In Proc. European Conference on Computer Vision. 619–635.
10. Cewu Lu, Renjie Liao, and Jiaya Jia. 2015. Personal object discovery in first-person videos. IEEE Transactions on Image Processing 24, 12, 5789–5799.
11. Cristian Reyes, Eva Mohedano, Kevin McGuinness, Noel E O'Connor, and Xavier Giro-i Nieto. 2016. Where is my phone? Personal object retrieval from egocentric images. In Proc. first Workshop on Lifelogging Tools and Applications. 55–62.
12. Dandan Shan, Jiaqi Geng, Michelle Shu, and David F. Fouhey. 2020. Understanding human hands in contact at Internet scale. In Proc. IEEE Conference on Computer Vision and Pattern Recognition. 9869–9878.
13. Gunnar A. Sigurdsson, Abhinav Gupta, Cordelia Schmid, Ali Farhadi, and Karteek Alahari. 2018. Actor and observer: Joint modeling of first and third-person videos. In Proc. IEEE Conference on Computer Vision and Pattern Recognition. 7396–7404.
14. Masaya Tanbo, Ryoma Nojiri, Yuusuke Kawakita, and Haruhisa Ichikawa. 2017. Active RFID attached object clustering method with new evaluation criterion for finding lost objects. Mobile Information Systems 2017, 3637814.
15. Pixie Technology. 2017. The nation's biggest lost and found survey, by Pixie. https://tinyurl.com/yxrzbsnp. archived: 2017-12-06.

INNO SPACE
SJIF Scientific Journal Impact Factor

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर
NISCAIR

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

IN SCIENCE, ENGINEERING AND TECHNOLOGY

| Mobile No: +91-6381907438 | Whatsapp: +91-6381907438 | ijmrset@gmail.com |

www.ijmrset.com