Chapter 6

Internet of Things With Object Detection: Challenges, Applications, and Solutions

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ABSTRACT

In recent years, everyday objects and locating of people become an active area in IoT-based visual surveillance system. Internet of things (IoT) is basically transferring data with numerous other things. In visual surveillance systems, conventional methods are very easily susceptible to the environmental changes (i.e., illumination changing, slow motion in the background due to waving tree leaves, rippling of water, and variation in lightening condition). This chapter describes the current challenging issues present in literature along with major application areas, resources and dataset, tools and advantages of IoT-based visual surveillance systems.

1. INTRODUCTION

Over the last few decades, the object detection is the initial step, and plays an important role in various applications of computer vision. It is the first step applied to extricate the most informative pixel from the sequence of video captured from CCTV cameras or IP cameras. Till now in literatures various algorithms are present in literature for the detection of object from video sequence. This chapter provides a detailed overview of Internet of things with Object Detection: Challenges, Applications and Solutions (OGC Senor, 2016; Ren et al., 2018). Internet of Things is an emerging field wherein a lot of classical approaches can be inculcated. Detection of motion based object is considered as a complicated task because the object may vary in shape, size or color.

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Since, 1990’s this approach has been broadly studied and applied by several authors for motion detection, object detection, locating people, indoor-outdoor sequence, logo detection, unusual activity detection, industrial automation, traffic monitoring, medical analysis and other commercial appliances. In computer vision, the effectiveness usage of internet of things, GPS trajectory, and location prediction can be carried out by maintaining a connection between an IP cameras with visual output devices over internet protocol (Felzenszwalb et.al., 2010; Brown, E., 2016; Aribas & Daglarli, 2017; Hu & Giang, 2017).

Mining motion based object data such as trajectory prediction (GPS), and location prediction in rapidly increasing day by day. Trajectory classification can be best suited to utilize the video sequences of the locations that are visited by the moving or motion based object. Location prediction also plays another important key role in predicting the historical location of motion based object, basically it aims to forecast that the object may visit (Overview of Internet of Things, 2018). The upcoming or next location of moving object can be predicted by comparing the current object location. In this chapter a detailed overview with combination of object detection technique with Internet of Things (IoT) concept is presented in this chapter. The first step in any computer vision and digital image processing is to detect the most informative object from the video sequence to perform any task related to it. The Five waves of IoT is shown in Figure 1.

Now days, computer vision is an emerging research area in various applications, it becomes necessary to have an robust system that efficiently detect, track and recognize the object from video sequence. The need of object detection is increasing day by day and can be easily visualized in various applications such as industrial automation, military, and other commercial appliances. The Internet also plays a vital role in numerous areas of computation such as banking, social Networking, online bookings and so on.

*Figure 1.*

![Five waves of IoT for now](image)
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