in 1999 by Kevin Ashthon during his work at Procter & Gamble (https://bit.ly/2K5hUgH (accessed on 25 July 2022)). The term eventually captured widespread attention in the following decades. IoT gained momentum in real-time sensing, effective information exchange, reduced cost and energy, and improved work efficiency/productivity. In 2008, the International Business Machines Corporation (IBM) introduced the concept of a "Smart Planet". It intends to employ massive IoTs to harvest IoT's benefits [1]. A similar concept of "smart city" is about the use of IoT to automate operations (for example, sensing, automating, and monitoring) around public facilities such as buildings, public transit systems (including buses, subways, light rail, commuter rail, trolleys, and ferries), streets installations (lamps, traffic lights, notice boards, billboards), hospitals, schools, public offices, among others inside the city premises [2]. An integral part of a "smart city" is the "smart home", which is about controlling and monitoring home appliances for audio, video, lighting, cooking, cooling, heating, surveillance, freezing, and power, among others [1] through the Internet applications. The idea of integrating IoT has been expanding to the areas of self-driving technologies (SDTs). Google, for instance, ventured into developing self-driving technology (SDT) at the Google X lab in 2009. In 2020, Alibaba-funded start-up—AutoX—launched fully driverless RoboTaxi in Shanghai, China (https://bbc.in/3iVFCmc (accessed on 14 June 2022)). Researchers are striving to enhance the safety and effectiveness of driverless technologies to operate in complex, dynamic environments. During the recent decade, IoT has been increasingly adopted in personal and public health [2,3], home [4], agriculture and forestry [5–7], climate and meteorological studies [8], among others. In Section 3, we will briefly discuss IoT applications grouped into seven different categories of IoT systems. In the following section, let us briefly discuss the motivation and contribution of this article. Motivation and Contribution According to IoT Analytics (https://bit.ly/3XPS99p (accessed on 30 December 2022)), the number of IoT devices grew by 9% to reach 12.3 B globally in 2021. The COVID-19 pandemic catalyzed IoT adoption in the workplace, education, and public services. It also reported that the predicted number of connected IoT devices will reach 27B by 2025. By 2025, IoT will produce (estimated) 79.4 zettabytes (ZB) (~79 × 1012 GB) of data. By the same year, the economic impact of IoT will reach (estimated) 11 trillion dollars (https://bit.ly/3iXjRCy (accessed on 14 June 2022)). In the meantime, 58% of cyberattacks occurred over IoT devices. Those attacks mainly were DDoS attacks and pilfering of confidential data. More than 1.5 B security breaches occurred over IoT in 2021 alone. While 64% global organizations use one or more IoT solutions, 43% do not protect them adequately (https://bit.ly/3D4vQoP (accessed on 14 May 2022)). The extent of growth and adoption of IoT is astounding. According to Cybersecurity Ventures, global cybercrime expected costs to grow by 15 percent per year over the next five years, reaching USD 10.5 trillion annually by 2025, up from $3 trillion in 2015 (https://bit.ly/3iT3sPz (accessed on 14 June 2022)). According to IBM data breach report 2021 (https://ibm.co/3XMOrxv (accessed on 15 June 2022)), the average total cost of a data breach increased by nearly 10% ($3.86 M in 2020, $4.24 M in 2021) year over year, the most significant single-year cost increase in the last seven years. However, due to a deficiency of security knowledge applicable during deploying the IoT, harvesting data from IoT, and consuming the IoT data or services, the fate of the life and properties are at higher stake than ever [9]. On the other hand, blockchain technology [10–12], yet another popular technology that operates on top

of the Internet , has been adopted as a revolutionary technology for "trustless" transaction verification and process automation. Popular blockchain frameworks such as Bitcoin [13] and Ethereum [14] have been increasingly utilized for payment for online transactions and transferring money between user accounts without the need for participating banks or credit card companies. It also tracks food, prescription drugs, and