

# Chapter 12

## Automated Home Security System Based on Sound Event Detection Using Deep Learning Methods

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### ABSTRACT

*The prevention of domestic risks is important to guarantee protection inside the domestic surroundings. Domestic injuries are regularly because of negative renovation or carelessness. In both cases, an automatic device which could help us become aware of a chance may want to prove to be of critical importance. In this re-search, an Automated Home Security (AHS) gadget was developed with the intention of detecting capacity risks in unattended home environments. To accomplish this, low-fee acoustic sensors were applied to seize sound events usually located in domestic settings. The captured audio recordings have been in the end processed to extract applicable characteristics with the aid of generating spectrograms. This information was then fed right into a convolutional neural network (CNN) for the cause of identifying sound occasions that would potentially pose a danger to the well-being of individuals and assets in unattended home environments. The model exhibited a excessive level of accuracy, underscoring the effectiveness of the technique .*

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## INTRODUCTION

In recent years, technological evolution has advanced numerous answers to make normal life less difficult: From smartphones to wearable devices, technology increasingly tends to create gear that man can use in normal life to simplify the maximum common activities (Taalbi, 2020). Many interact with every other via software environments and with well-described standard verbal exchange protocols (IoT) (Madakam et al., 2015), developing a real automation gadget. These innovations have additionally worried home environments with the start of intelligent structures defined as smart houses or smart homes (Al Dakheel et al., 2020), (Minoli et al., 2017). The goal is to make the systems increasingly secure and efficient, thus guaranteeing advantages in economic terms and at the equal time making sure more consolation for humans, especially human beings with motor and cognitive impairments, to cause them to as impartial as feasible and simplify some of their daily actions (Agarwal et al., 2010). Home Automation is one of the maximum thrilling technological realities of recent years due to the fact it could make a housing shape clever (Gomez et al. 2010). The time period “clever home” refers to residential surroundings this is thoughtfully designed and geared up with superior era to facilitate diverse activities in the household, along with controlling lighting, home equipment, air conditioning, and get entry to doorways and windows. Additionally, clever domestic era complements security with the aid of supplying functions like anti-intrusion manage, fuel leak detection, hearth tracking, and flood prevention. Moreover, clever homes permit for remote connections with help services, enabling tele-aid and tele-monitoring functionalities. (Brush et al., 2011). The objective of Home Automation is consequently to help people stay in safer and extra comfortable homes, with an easy, reliable, bendy, and low-cost automation device, theoretically within all people's reach, with a better comfort than that of lifestyle-al structures and the possibility mind with low fee (Yang et al., 2018). The residence is surroundings constructed across the wishes of folks that live there, it's far nothing greater than the result of a sequence of desires that decide the department of areas in a positive manner. The house, consequently, is the middle of personal nicely-being, the area where the whole thing needs to be able to enhance one's standard of residing. In current years, the growing technological improvement has made it viable to create wise items which, inserted inside the home environment, permit to increase consolation internal one's home (Piyare, 2013). The simplicity of installation allows the implementation of precise answers that permit you to screen and manage everything of the home. Smart domestic systems are presently divided into two categories: the first create an environment around a crucial node, a gateway, called a hub. All the intelligence of the clever device is living inside the hub, and it is this that permits the relationship of all the gadgets scattered around the house. For instance, clever

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