SENSING AND DETECTING HIDDEN CAMERAS

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ABSTRACT

As technology development in the monitoring devices is a great fortune to the society, but misusing of this technology will create a suspicious environment like hidden cameras. Hidden camera is a device, that can be hidden by structure or by any decoration item in the room, which is used to monitor and record the actions to provide safety environment. But it also causes trouble to us mainly in personal privacy issues. Even today there is no proper and efficient solution to detect the hidden cameras. So, we are going to develop a new project based on this topic. In this project we are going to develop an Android mobile application that is used for detecting the hidden cameras which will record the person's activities in the clustered environmental areas like trail rooms of shopping malls, the knob or bolt of a room door in hotel rooms. This application works by electromagnetic frequencies to detect the camera lenses. If any camera is present in that place it updates to the user's mobile with an alarm sound and message displayed on mobile screen who opens and checks for cameras. Then the user will be cautious and take action.

Keywords

Electro magnetic waves detection, Hidden camera, small spaces, security, privacy, manual checking

1. INTRODUCTION

A hidden camera or spy camera is a still or video camera used to record people without their knowledge. The term "hidden camera" is commonly used in TV shows, sometimes when subjects are unaware that they are being recorded, and usually lacking their knowledge and consent. The term "spy camera" is generally used when the subject would object to being recorded if they were aware of the camera's existence. In contrast, "security cameras" refer to cameras that are visible and/or accompanied by a warning notice of their presence. The camera may be "hidden" because it is not visible to the subject being filmed, or is disguised as another object. Such a camera may not be visible to the subject, for example, because it is fitted with a long-focus lens and located beyond the view of the subject, or located, say, behind a two-way mirror. Hidden cameras can be built into commonly used objects such as television sets, smoke detectors, alarm clocks, motion detectors, ink pen caps, plants, and mobile phones. Hidden cameras may be used for household surveillance devices and may also be used commercially or industrially as spying. The proliferation and lower costs of video recording devices have led to an increase in the use of hidden cameras for legitimate surveillance need, as well as for entertainment and other purposes. The use of hidden cameras raises personal privacy issues and there may be legal aspects to consider, depending on the jurisdiction in which use takes place. The issue of hidden cameras at public places became a severe threat to people these days. The main objective of this project is to provide safety and security of the people to get know the cameras are present in the room with the help of this mobile application. The cameras are secretly put up in the changing room, theatres, restrooms and other public places which affect the privacy of the people. Some people might argue that cameras are easy to find

and this is unnecessary, but this is really a tough job to find a hidden camera in a room. Most of the camera is wireless and hence became very easy to hide. Manually, finding a camera is almost impossible. This is based on the fact that almost all the camera devices work within the frequency range 0.1GHz to 3 GHz. By this, we can prohibit the unauthorized use of the camera by using a lens detector that senses the presence of hidden camera as they radiate RF signal for transmission. By this, we can even detect the presence of small video cameras whose frequency range is 0.05GHz to 3GHz (which is a quite difficult task as we need to differentiate the video signals from WIFI signal and TV signal). By using AI with lens detector feature help find the hidden cameras in the room by doing frame by frame analysis of scanning the room of any hidden camera lens present in the room.
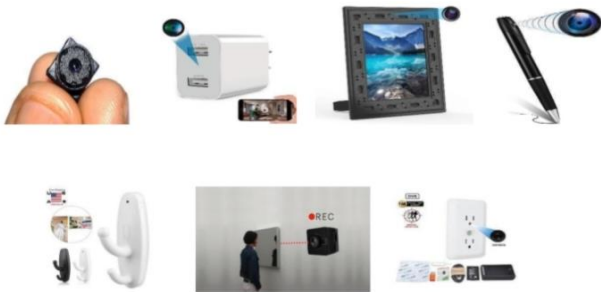
2. TECHNOLOGIES USED

Java Technology

Java is a programming language and a platform. Java is a high level, robust, object-oriented and secure programming language. Java is a cross-platform object-oriented programming language that was released by Sun Microsystems in the year 1995. Today,

Java is needed to run various applications such as games, social media applications, audio and video applications, etc. It is highly popular and has dominated this field from early 2000's till the present 2018.

Flutter Framework

Google's product, Flutter has gained tremendous attention from developers across the globe. Flutter allows developers to build applications both for Android and iOS platforms with the help of Dart, another Google-owned language. Flutter, unlike the other available frameworks, neither uses a web view nor a native UI component to building mobile apps. To stop this, flutter uses Skia, a 2D engine that renders visual components inducing a theme like an appearance. Further, the fact that flutter has the best hot-reloading feature, it is growing as one of the best mobile app development frameworks.

Android Studio

Android Studio is the official Integrated Development Environment (IDE) for Android app development, based on IntelliJ IDEA . On top of IntelliJ's powerful code editor and developer tools, Android Studio offers even more features that enhance your productivity when building Android apps. The official language for Android development is Java. Large parts of Android are written in Java and its APIs are designed to be called primarily from Java. It is possible to develop C and C++ app using the Android

3. EXISTING SYSTEM

This application works only if there is an IR sensor that has been already built at the time of mobile making. Certain considerations or actions have been taken out through which we were able to provide significant results which went successful.

Disadvantages:

- It sometimes shows wrong outputs
- It checks cameras manually
- It doesn't detect camera when it is present.

4. PROPOSED SYSTEM

The proposed device will have electromagnetic sensor, the moment when the user opens the app it stats detects the electromagnetic waves from an activated camera, it starts to alert us with an alarm sound and a message which will be on the device. The alarm sound continues until the signal transmission takes place. Just about any kind of electronic device emits electromagnetic radiation at various frequencies depending on its design. Any time you have a varying electrical current in a conductor, you have electromagnetic fields radiating from it. In the case of a video camera, some of that EMF radiation will be in the VLF frequency range. So, a circuit detecting gigahertz is required. This detection is done by our mobile through electromagnetic sensor in our mobile, when the camera is active, it transmits the signal in the form of sine wave. The signal contains electromagnetic radiation which

is received by the receiver in the base station. The camera transmits signals at regular interval to ensure its availability to the nearby base station (the place from where it is operated). Distance to the base station (i.e.,) from where it is being operated is an important factor. So, when the camera is in active our application detects electromagnetic frequency from active camera then it produces an alarm sound with a message displayed on the screen until the radiation of camera takes place.

Advantages

This application works based on electromagnetic frequency of the activated camera to detect whether the camera is present in that place or not. So, we are in safe in any place where we are preset through this application.

• Accuracy of detecting hidden cameras is more.

• Efficient and reliable in detecting hidden cameras.

5. ARCHITECTURE DIAGRAM

An architectural diagram is a diagram of a system that is used to abstract the overall outline of the software system and the relationships, constraints, and boundaries between components. It is an important tool as it provides an overall view of the physical deployment of the software system and its evolution roadmap. Architectural Diagram for this application is as follows:
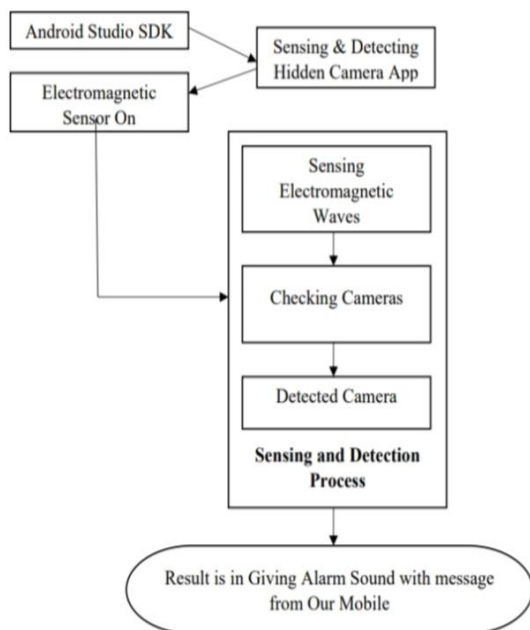
6. FUTURE SCOPE

The project presented here has some limitations and it can be extended further. The main limitation is that we are developing an app that checks the cameras manually by moving the mobile to everyplace in the room for detecting the camera based on the electromagnetic frequencies released by the active camera. If cam is present then it produces the alarm sound with a message displayed on the screen which should be a sometime taking process. Furthermore, we create mobile application in android studio using java code. The present work can be extended as below.

We can create a mobile application using AI technology which is trained by the ML algorithm of CNN with the help of IR rays released by the active hidden camera. The CNN extracts feature and detects the hidden cameras automatically.

We create a mobile app using android studio using python code. This app will work on the basis of mobile camera sensor which detects active hidden cameras present in the room.

It can also be worked on detecting hidden camera from long distance by giving distance.

By the help of CNN algorithm, it can extract the whole feature of hidden cameras like camera shape, size, IR rays etc and compares with the items in the room. If all the feature are match then it will detect the cameras. It removes the manual checking of cameras in the room due to giving particular distance. So that, when the user login into app and enter into any place then the camera sensor automatically on and detects camera automatically.

If the camera is present, it produces alarm sound with message displayed on the screen.

So, that the user get alert and reach the safe place.

7. CONCLUSION

The key goal of this project is to establish safety for people. According to the survey in India, 53% of the people are not feeling safe with the surroundings. Most of the people now became independent. Now a day there is a lot of issues regarding the hidden camera as they became a great threat to individual privacy and safety. This app is used to ensure safety and privacy in the areas where devices like camera, video camera are strictly prohibited. It detects the camera and produce an alarm with a message displayed on our

mobile screen. So, this device takes care of all the possibility of being spied by others and
alerts us.

REFERENCES

[1] Gayathri N., T. Sivasakthi, "Presence of active mobile phones and Hidden camera
detection", International journal of computing communication and information system
Volume 8 2016.

[2] Marc Roessler, "How to find hidden cameras",25 March 2002.

[3] K. Sonasri, K. Venkata Priyanka, "Detecting and disabling digital cameras using image
processing", P.S.R.R college of engineering.

[4]https://electronicsforu.com/electronics-projects/build-cell-phone-jammer

[5]https://www.techlicious.com/tip/the-secrets-to-finding-hidden-cameras/

[6]http://www.ti.com/lit/ml/slap127/slap127.pdf

[7]http://cds.linear.com/docs/en/datasheet/5534fc.pdf

[8]https://electronicsforu.com/electronics-projects/rf-signal-detector

[9]http://elprojects.blogspot.in/2010/02/hidden-camera-detector-laser-technology.html

[10]https://www.wikihow.com/Build-a-Hidden-Camera-Detector

[11] M. Roessler, "How to find hidden cameras," 2002.

[12] T. Liu, Z. Liu, J. Huang, R. Tan, and Z. Tan, "Detecting Wireless Spy Cameras Via
Stimulating and Probing," in Proceedings of the 16th Annual International Conference on
Mobile Systems, Applications, and Services, 2018, accessed 2018-09-18.

[13] Y. Cheng, X. Ji, T. Lu, and W. Xu, "DeWiCam: Detecting Hidden Wireless Cameras
via Smartphones," in Proceedings of the 2018 on Asia Conference on Computer and
Communications Security. ACM, 2018.

[14] H.264: advanced video coding for generic audio-visual services. Accessed 2018-05-
19. [Online]. Available: https://www.itu.int/rec/T-REC-H.264- 200305-S
"Core illumination: Traffic analysis in cyberspace.

[15] K. Geers, T. Chang and Y. Li, "Deep Shot: A Framework for Migrating Tasks Across Devices
Using Mobile Phone Cameras," ACM CHI '11. Proceedings of the SIGCHI Conference
on Human Factor in Computing Systems, p.2163-2172, 2011.

[16] S. Haruyama, "VISIBLE LIGHT COMMUNICATION USING SUSTAINABLE
LED LIGHTS," ITU Kaleidoscope: Building Sustainable Communities (K-2013), 2013
Proceedings of, 2013.

[17] B. Shneiderman and C. Plaisant, "DESIGNING THE USER INTERFACE 4TH
EDITION," Addison-Wesley Publishing Co., 2005.

[18] K. Kuraki, S. Nakagata, R. Tanaka, and T. Anan, "Data Transfer Technology to
Enable Communication between Displays and Smart Devices," Fujitsu Sci. Tech. J. Vol.
50, No.1, pp. 4045(2014).

[19] SAMINZDRAV – Connected Home Devices in Support of Independent and Healthy
Living, a project within the Biomedical Engineering Competence Centre,
http://storm.unimb.si/kcbme/index.php.

[20] M. Šavc, B. Potočnik, "Colour constancy using grey edge framework and image
component analysis," Transactions on internet and information systems, vol. 8, no. 12, pp.
4502-4512, Dec. 2014.

[21] Vijendra Babu, D, Yadav, D.K., Yadav, N.K., Verma, V.K.,MEMS based smart &
secure home automation system with multiway control & monitoring facility using smart
phone, Journal of Chemical and Pharmaceutical Sciences, 2015-April, pp. 357-359.

[22] Vijendra Babu, D, Reddy, L.N., Reddy, Y.D.K., Gautham, V., Gopichand, K.S,
Acquisition of cardiac signals using sensors in smart phones, Journal of Chemical and
Pharmaceutical Sciences, 2015-April, pp. 436-438

BIOGRAPHIES

Mr. Arla Gopala Krishna, is presently working as Assistant Professor in the Department of Computer Science and engineering at NRI Institute of Technology, Vijayawada. He has more than 7years of experience in teaching. His areas of interest Cloud Computing, Data Science, Deep learning.

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