NITROGENOUS COMPOUND DETECTION FOR EXPLOSIVE DETECTION

Kushal Choudhary

Department of Computer Science Engineering, Chandigarh University, Mohali

ABSTRACT:

Modern warfare has been composed of various deadly equipment and weapons having the capability to deteriorate human race as well as flora and fauna. It is the responsibility of the engineers to develop system and solutions to safeguard it. Explosive such as landmine has led to and will lead to death of thousands of innocent lives and to overcome this, various technologies have been introduced to detect and defuse such explosives efficiently and effectively.

Keywords: Nitrogenous compound, explosive, landmine

[1] INTRODUCTION

International research and science have developed different technologies to detect explosives such as landmines and defuse it to save lives of innocent civilians and defence personnel. Accuracy of the position of the landmine as well as the possibility of the presence of actual landmine and not just a metal is one of the challenging factor for detection of landmine. From low false alarm rate of detection to no false alarm rate, study of the materials used to develop the explosive and efficiently detection of those materials will lead to no false alarm rate.

Landmines are composed of various explosive materials formed from various nitrogenous compound such as nitro, nitrite and nitrate groups. Fabrication of a sensor having the capability and ability to sense nitrogenous compound in explosive will lead to overcome the low false alarm rate factor.

[2] Experimental

The basis of the fabrication of the sensor is based upon the nitrogenous compound sensing sensor which can be further equipped with various technologies to detect landmine explosives. As, the landmine explosives detonate only with pressure of more than 9 kg, it is safe for the technology equipped with the sensor to detect it as the modeled device would be less than the detonating weight. The fabricated sensor will have the ability to detect and distinguish nitrogenous compounds between the explosive and the nitrogenous compound in the soil.

The nitrogenous compound detection sensor will consist of a probe which can be inserted deep in to the soil and get in contact with the explosive and detect nitrogenous compound effectively. The fabricated sensor can be equipped with various hardware modules such as microcontroller and explore the use of the the sensor at various fields. The accurate detection of the landmine with no fault in detection will lead to an advanced state of the technology in determining and detecting explosives while increasing the security feature at a great extent.

The common explosive materials such as PETN, RDX , TNT, all are composed of nitrogenous compound such as nitro, nitrite and nitrate compounds. Based on the composition of the explosive material made of nitrogenous compound, detecting it's composition or detecting the nitrogenous compound is required. Landmines are composed of explosive materials made of nitrogenous compound composition. Each landmine requires 9 kg or more than 9 kg of pressure to detonate it. Fabricating a nitrogenous compound sensor with a probe that can be inserted in the soil and get in contact with the landmine which is equipped with a robot that can be accessed remotely, can be used to detect the landmine via nitrogenous compound detection from the material.

[3] APPLICATIONS

a) War fields: With the emerging advanced robots that can be accessed remotely, the sensor can be equipped with the robot. During war, thousands of army personnel loose their life by stepping on a landmine. The robot can be used to clear the path..

b) Clearing mass landmine: Over more than 2 lakh landmines are still buried from the era of world war II, It is necessary to clear those landmines in order to save lives of innocent civilians. Multiple devices can be deployed to search for landmines and defuse it.

c) The same device can also be used by the police department and can be deployed across the city to detect explosive at the time of any threat.

d) Adding up one more IoT gadget to the technologies used by the defence organization to reduce conflicts.

[4] CONCLUSION

Implementing the concept of detection of nitrogenous compound for explosive detection will lead to the one of the most accurate devices developed with no false alarm rate of detection. The sensor is to be fabricated and can be installed over many autonomous robots which will then remotely detect landmines and give its position. This technology will help the defence organization to save lives of thousand civilians and army personnel at a great extent.

[5]REFERENCES

- J. MacDonald, J. R. Lockwood, J. McFee et al., "Alternatives for landmine detection," Rand Corporation, ch. 2, 2003.
- Yarovoy, T. Savelyev, X. Zhuge et al., "Performance of UWB array-based radar sensor in a multi-sensor vehicle-based suit for landmine detection," in Proceedings of the 5th European Radar Conference (EuRAD '08), pp. 288–291, October 2008
- HIMOI, N., TAKITA, Y., NONAMI, K. and WASAKI, K., 2001, Smart sensing for mine detectionstudies with IR cameras. Proceedings of 2001 IEEE International Symposium onComputational Intelligence in Robotics and Automation,1, pp. 356–361.
- **https://www.intechopen.com/books/mine-action-the-research-experience-of-the-royal-** military-academy-of-belgium/ground-penetrating-radar-for-close-in-mine-detection
- https://www.tandfonline.com/doi/abs/10.1080/01431160802549435
-
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6695582/
- https://www.sciencedaily.com/releases/2019/09/190913191445.htm
- **https://www.researchgate.net/publication/225752842_A_Comparative_Study_of_Landmine_Detection_Techniques**

- **https://en.wikipedia.org/wiki/Demining**

- https://science.howstuffworks.com/landmine5.htm