

Landmine Detection With Ground Penetrating Radar Using

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Landmine Detection With Ground Penetrating

Abstract: Novel, general methods for detecting landmine signatures in ground penetrating radar (GPR) using hidden Markov models (HMMs) are proposed and evaluated. The methods are evaluated on real data collected by a GPR mounted on a moving vehicle at three different geographical locations. A large library of digital GPR signatures of both landmines and clutter/background was constructed and used for training.

Landmine detection with ground penetrating radar using ...

Over the last few years researchers at Universidad Javeriana Bogotá, a University in Colombia, have been looking into using SDRs for aerial landmine detection. The research uses a USRP B210 software defined radio mounted on a quadcopter, together with two Vivaldi antennas (one for TX and one for RX). The system is then used as a ground penetrating radar (GPR).

Aerial Landmine Detection using USRP SDR Based Ground ...

Landmines are affecting the lives and livelihood of millions of people around the world. The video impulse ground penetrating radar system for detection for small and shallow buried objects has been developed. The hardware combines commercially available components with components specially developed or modified for being used in the system.

LANDMINE DETECTION USING IMPULSE GROUND PENETRATING RADAR

This paper presents the development of a lightweight and low-power Ground Penetrating Radar (GPR) to detect buried landmines in harsh terrain, using an Unmanned Aerial Vehicle (UAV). Despite the fact that GPR airborne systems have been already used for a while, there has yet been no focus on the UAV autonomy, which depends on the payload itself.

A Lightweight and Low-Power UAV-Borne Ground Penetrating ...

There are many landmine detection modalities that can be used with a UGV. However, the ground-penetrating radar (GPR) and the metal detector (MD; electromagnetic induction sensor) are fast and may be the most reliable means of landmine detection. In addition, GPR and MD sensors can easily be packaged in one sensor head.

Combined metal detector and ground-penetrating radar ...

Ground-penetrating radar (GPR) is currently a well-accepted geophysical technique which has been successfully deployed with the aim of addressing important sensing problems that requires detection, imaging and identification of dielectric material discontinuities in the sub- surface through the

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use of radio waves, providing a non-invasive method to probe the ground.

UAV for Landmine Detection Using SDR-Based GPR Technology

The Husky vehicle is equipped with NIITEK's VISOR™ 2500 Ground Penetrating Radar (GPR), with four panelled 3.2m array at the front. The GPR detects the mines and explosives by using hydraulically-controlled deploy and retract modes. The GPR can be optionally installed with EMI Coils three-meter Wide Scan for See-Deep Metal Detector Array.

Husky Vehicle Mounted Mine Detector (VMMD) - Army Technology

Metal detectors and ground penetrating radar have become the standard sensors for buried landmine and UXO detection. Joint systems have existed since the late 90s. Recent system development has again led to the placement of MD and GPR sensors on ground vehicles for detection of in-road landmine and UXO objects.

Dual sensor platforms for UXO/landmine detection using GPR ...

As all landmine detection methods have strengths and weaknesses in different environments, the authors suggest that the federal government undertake a research and development effort to develop a multisensor mine detection system over the next five to eight years. ... Ground-Penetrating Radar (Paper I) PDF. Lawrence Carin. Appendix F. Ground ...

Alternatives for Landmine Detection | RAND

A land mine is an explosive device concealed under or on the ground and designed to destroy or disable enemy targets, ranging from combatants to vehicles and tanks, as they pass over or near it. Such a device is typically detonated automatically by way of pressure when a target steps on it or drives over it, although other detonation mechanisms are also sometimes used.

Land mine - Wikipedia

In this paper, an algorithm is proposed to reduce clutter signal due to the reflection from the ground surface in ground penetrating radar (GPR) measurements. The proposed technique has been applied to a GPR, which has been used to detect subsurface anti-personnel (AP) landmines.

Clutter reduction and detection of landmine objects in ...

The system is then used as a ground penetrating radar (GPR). GPR is a method that uses RF pulses in the range of 10 MHz to 2.6 GHz to create images of the subsurface. When a transmitted RF pulse hits a metallic object like a landmine, energy is reflected back resulting in a detection.

ground penetrating radar - rtl-sdr.com

in various testing data sets collected from the vehicle mounted ground penetrating radar to evaluate their ability to improve the detection result and reduce the false alarm rates. Both of them are proved to be useful in improving the detection of landmines.

ADVANCED FEATURE BASED TECHNIQUES FOR LANDMINE DETECTION ...

Soil properties and performance of landmine detection by metal detector and ground-penetrating radar — Soil characterisation and its verification by a field test. Journal of Applied Geophysics, Volume 73, Issue 4, 2011, pp. 368-377. Show abstract. Metal detectors have commonly been used for landmine detection, and ground-penetrating radar ...

Radar facies of unconsolidated sediments in The ...

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Metal Detection Ground Penetrating Radar. Electromagnetic Induction Sensor. The Infrared Sensor (IR). The Ultra Sound Sensor. Buried Mine Detection. 3. When a metal target enters the field, eddy currents circulate within the target. This causes a load on the sensor, decreasing the amplitude of the electromagnetic field.

Landmine Detection Sensors

Corpus ID: 10834605. Landmine Detection using 3-dimensional Ground Penetrating Radar System in a Network Centric Environment @inproceedings{Eide2004LandmineDU, title={Landmine Detection using 3-dimensional Ground Penetrating Radar System in a Network Centric Environment}, author={E. Eide and J. Hjelmstad and Bragstads Plass}, year={2004} }

Landmine Detection using 3-dimensional Ground Penetrating ...

Page 5 of 11 BACK GROUND Landmine detection using UWB radar has made considerable advances since the first work carried out in the 1970's and early 1980's by researchers in the UK and US. The early work revealed many of challenges posed by the basic physics of propagation and set the foundation of understanding.

REPORT.docx - Page 1 of 11 LANDMINE DETECTION USING GROUND ...

However, only a few are currently employed in real mine-affected areas. One of these relatively new technologies is ground penetrating radar (GPR), an attractive choice for landmine detection due to their advantages over other sensors. GPR can detect both metallic and plastic mines in a variety of soils by noninvasive subsurface sensing . GPR sends a series of microwave pulses ranging from about 1 to 4 GHz into the ground.

Ground-Penetrating Radar for Close-in Mine Detection ...

A great variety of methods for detecting landmines have been studied. These include electromagnetic methods, one of which (ground penetrating radar) has been employed in tandem with metal detectors. Acoustic methods can sense the cavity created by mine casings. Sensors have been developed to detect vapor leaking from landmines.