

The effectiveness of Ground Penetrating Radar in detecting buried objects

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Reliable information such as the position of buried utilities underneath the ground is an important ingredient in any undertaking. The most difficult part of obtaining information about buried objects or utility lines is that very little is visible. Existing drawings, plans or information can sometimes be obtained from relevant parties but many times they are inaccurate, faulty or incomplete. A suitable technique such as GPR, ultrasonic, and IR Imaging has to be used to obtain the information from underground.

In this paper we are going to discuss the effectiveness of the Ground Penetrating Radar (GPR) to detect an underground objects such as concrete, voids, cavities, pipes, bones, etc. These objects were buried at a known depth and location. Data that collected can be interpreted after applying simple processing or data enhancement such as band-pass filter and AGC. Depth conversion was also done to convert the time to depth section. The result shows all the objects can be detected however an experience operator manages is needed to predict the depth and the width of each object.

Maklumat yang tepat berkaitan dengan kedudukan dan kedalaman objek-objek tertanam adalah penting sebelum sesuatu kerja pengorekan dilakukan. Maklumat ini sukar diperolehi. Kebiasaannya peta-peta atau rekod-rekod penanaman objek merupakan sumber rujukan awal, walau bagaimana pun rekod-rekod ini kadangkala ketinggalan zaman dan sukar diperolehi. Oleh itu teknik-teknik pengesanan seperti GPR, ultrasonic, dan Pengimejahan IR mestilah dilakukan terlebih dahulu.

Dalam kertas kerja ini, kami akan membincangkan keberkesanan teknik Radar Penembusan Bumi (Ground Penetrating Radar, GPR) bagi mengesan objek yang ditanam seperti kepingan kinkrit, lohong (tong plastik), batang paip dan juga tulang lembu. Bahan-bahan ini ditanam terlebih dahulu dan rekod penanamannya seperti lokasi dan kedalaman direkodkan. Data yang diambil boleh ditafsirkan sebaik sahaja pemprosesan mudah seperti penurasan dan peningkatan signal dilakukan. Penukaran masa kedalaman juga dilakukan bagi mendapatkan maklumat kedalaman. Hasil kajian mendapati semua objek yang ditanam dapat dikesan, walau bagaimana pun kecekapan dan pengalaman diperlukan bagi mendapatkan kedalaman dan kelabaran yang tepat untuk setiap objek.