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Multisensor imaging systems for landmines detection

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The problem of humanitarian demining has been further aggravated by the extension of world conflicts. For the removal of anti-personnel mines, especially those with low metal content, the multi-sensor approach seems promising as shown by the literature [1]. The idea of introducing GPR technology to landmine detection started in 1990s. Many research groups started investigations and several types of prototype GPR system were demonstrated and a few commercial dual sensor, which combines electromagnetic Induction sensor (EMI sensor) were introduced by 2010. Many commercial EMI sensors have been used in real mine fields, and the technical standard of EMI sensors are defined by SOP (Standard Operation Procedure) of each country. However, GPR was a new technology, and the establishment of SOP was not easy, and CEN workshop has been conducted. Some scientific approaches have started for effective use of GPR for landmine detection.
In this work we propose a comparison between multisensor imaging systems for the detection and mapping of anti-personnel mines developed by two different research groups: the portable dual sensor ALIS [2] and a team of cooperating robots controlled remotely [3]. Both approaches use a combination of sensors among which the main ones are penetrating microwave radars and metal detectors, and they were demonstrated together on the field during the event reported in [4]. The work presents first a comparison between the various characteristics of the two systems to identify not only their advantages and disadvantages, but also their complementary aspects. For the detection and mapping, the 2D/3D images obtained from radar scans of some samples of anti-personnel mines buried at low depth will be compared.

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