TIRAMISU: A review of Mid-Term Progress in Developing New Tools for Mine Action

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Review of various tools under development

TIRAMISU is a research and development project funded by the European Commission. The objective is to provide the Mine Action community with a toolbox to assist in addressing the many issues related to Humanitarian Demining and thus promoting peace, national and regional security, conflict prevention, social and economic rehabilitation and post-conflict reconstruction.

TIRAMISU stands for Toolbox Implementation for Removal of Anti-personnel Mines, Submunitions and UXO.

The tools are being developed at different speed and have now different maturity. Since the project has reached the middle of its four-year duration, now is a good time to review some of the achievements.

To help non-technical survey the work on an Advanced Intelligence Decision Support System , called T AI-DSS, is worth mentioning. The work on the module for the analytical assessment of suspected hazardous areas is described by Matic et al (1). Details on the data acquisition for this tools is given by Ivelja et al (2). A key aspect of this tool is the concept used for semi-automatic interpretation which is explained by Racetin et al (3).

A light-emitting polymer sensor is being developed to detect explosives. The work of Morawska et al is presented in (5). For the development of an intelligent manual prodder, see Baglio et al(8).

Some work was done also to help bring detectors safely to a dangerous areas. For instance a metal detector array mounted on a mobile robot is being tested. More details are provided by Balta et al (6). A novel approach of using hyper-spectral cameras mounted on a ground vehicle is explored by Bajic (15). LOCOSTRA, a vehicle derived from agriculture that can be equipment with various implements, is described by Cepolina (11).

Some of the tools being design will help the disposal of explosive ordnance. An ERW blast containment vessels was field tested. The tool is described by Szczepaniak et al (10).

Two are being developed for mine risk education. A radio broadcast theater play which included mine risk education messages was tested in Algeria. The concept of this method is given by Scapolla and Cepolina (9). A computer game, which also embeds mine risk education message is being developed and is described by Kaczmarczyk et al (12).

Training is a task of paramount importance. A human-machine interface for training activities with hand-held detector is presented by Fernandez et al (7). Operating a robotic platform also requires training. A training system for such a purpose is presented by Bedkowski et al (13).

One challenge in having a toolbox and not only a set of tools is to design tools that can exchange data with each other. The solution that is proposed is the TIRAMISU Repository System which is described by Peeters et al (4) and Lizska (14).

Standardization: two new guidelines being drafted

Two CEN Workshop Agreement are being drafted.

Since the objective of technical survey is not to detect and destroy all mines, the performance of a mechanical asset used for this purpose cannot be measured only by its ability to destroy mines as in CWA 15044 (2004). A new definition of ‘performance’ and methods to measure it must be developed. The requirement for such guidelines can be found in Cepolina (16).

In 2007 CWA 15756 was drafted to specify “methods for the testing, evaluation, and acceptance of PPE [personal protective equipment] for mine action against anti-personnel blast mines”. Unfortunately some methods proved to be too severe and some PPE failed the test, despite a good track-record. This led to the withdrawal of the CWA. There is therefore a need to revise this CWA and make the test more realistic.
The protection against fragmentation will benefit from the work of Kechagiadakis and Pirlot (17) who designed

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a system to testing equipment under near-simultaneous triple impacts to take into account that an explosion of a mine or ERW generates multiple fragments that may hit a PPE nearly simultaneously with consequences that are very different from multiple single impacts.

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