

First results: Robot mapping of sites contaminated by landmines and unexploded ordnance.

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Landmines and unexploded ordnance are a serious threat to the life and livelihood in post conflict areas in many parts of the world. In addition to the many casualties each year, the inaccessible roads and loss of cultivated areas have a significant impact on the local economy. Many organisations are running humanitarian demining projects to clear the contaminated sites. But progress is slow since mine clearance is a very time-consuming process, and there is no room for error since most existing techniques involves an operator on site. A number of research projects have demonstrated various mine detection robot prototypes during the past decade, yet robots do not seem to be utilized in practical humanitarian demining projects.

The Biosystems Engineering Group at the University of Southern Denmark collaborates with companies experienced in design of all-terrain vehicles and sensor technology to develop autonomous tool carriers for use in biological production applications. This article presents the first results applying this combined knowledge and experience to humanitarian demining.

The aim is to develop a low-cost, reliable, efficient and user-friendly robot capable of detecting and mapping landmines. It is hypothesized that with the exception of very inaccessible terrain an autonomous robot will be more efficient and reliable for mapping detected landmines than manual methods using the same sensor technology. At the same time it does not expose the operator to the risk of harm.



This paper presents the first results from the project. The existing robot platform design has been simplified to lower cost and allow repair in the field with limited tools and spare parts. The robot will be able to utilize various mine detection implements and support different detection methods simultaneously. The FroboMind architecture based on Robot Operating System (ROS) is used for robot control. Software components will be released as open-source for others to build upon.

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