Humanitarian Demining - UAV-Based Detection of Land Mines

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SUMMARY

Humanitarian Demining - UAV-based detection of land mines

The humanitarian clearance of land mines is still a huge challenge:

- According to UN-requirements at least 99.6% of all mines must be cleared up to a depth of 13 cm,
- There are different types of mines (metal, minimum metal, nonmetal)
- Mines in different environments (city, jungle, desert) were placed regularly or ir-regularly and can be redistributed by erosion and surface movements.

In 2015 a feasibility study proved the possibilities of a UAV-based mine detection system for the automatic detection of landmines. In a cooperation of 3 Swiss and German Universities since early 2016 a UAV-based system for mine detection is developed, which will be first used for the process of land release (a very important part of mine action). The system consist of a 5kg payload drone, a low cost RTK-GNSS-System, cameras for a photogrammetric production of a DTM, microwave sensors for mine detection and an anti-collision system. One of the key problems is the required high position- and orientation-accuracy of the drone to operate the microwave mine detection sensors (SAR / GPR) properly. The whole system will be designed for an easy use by minimum trained operators.

This paper is focussing on the actual state of the project and on future perspectives and
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