

Team Information

AirBorneMineScan



Picture of vehicle:

Name of vehicle:

“too expensive and nonexistent”



Picture of team leader:

Name of team leader:

Dr. Heinrich Meurer

Team Name:

AirBorneMineScan

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Team Description:

The AirBorneMineScan Team is GeoTec's entry into the M-ELROB2010. The team is largely composed of researchers from Fraunhofer Institute for Laser Technology ILT under the leadership of Dr. Martin Wehner (director Life Sciences lab) and Fraunhofer Institute for Molecular Biology and Applied Ecology under the leadership of Dr. Stefan Schillberg (director Plant Biotechnology Lab)

Our vehicle is called “too expensive and nonexistent” because it is nonexistent. We are active in the detecting and not in the driving segment of reconnaissance.

We detect traces of explosives leaking from landmines, booby traps and IED's using genetically modified live soil bacteria as fluorescent biosensors for trace explosives. Once our biosensors have been dispersed over the search area, a scanning laser with a wavelength matching the biosensors is employed to excite and detect fluorescence in biosensors which were activated by contact with trace explosives.

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Our biosensors are sensitive to TNT and TNT derivatives. They can be spread over a large search area using a crop duster plane or ground based vehicles.

In detecting trace explosives we make use of the fact that all explosive devices leak constantly detectable amounts of explosives into the environment where they mainly accumulate in and on the soil surrounding the explosive device. This halo of explosives molecules represents a stable signal which pinpoints the presence of an explosive device in the field. The same halo of trace explosives is also being used with great success by the mine detection dog.

However we ultimately aim at a truly stand off detection using crop duster planes to spread our biosensors rapidly over wide areas and a single engine sensor plane with a mounted modified LIDAR to detect and georeference in flight fluorescent biosensors on the ground. Other variations could encompass the use of ground based vehicles to spread and/or to detect our biosensors.

The development of the AirBorneMineScan technology began in January 2007. At the time of the initial team application, the technology is largely functional in the lab and has logged zero miles along a test course.

We intend to enter the contest with a static or semi-static display making use of a laboratory set up of a forward looking scanning laser and mock up biosensors. For the purpose of demonstrating our fluorescence detection technology the mock up biosensors will function like our real biosensors. The real biosensors are genetically modified live organisms and not yet licensed for release into the wild.

Due to budgetary restraints we have not modified our laser system for deployment using a ground based vehicle. However we do have a novel sensor system and pending sufficient funding would consider cooperation with a team entering a vehicle capable to carry about 20-30 kg.

Selection of scenario:

1. Reconnaissance and surveillance X
5. EOD X