

MULTIFUNCTIONAL ROBOTIC SYSTEM FOR CBRNE APPLICATION

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Abstract

Robots can facilitate response planning, maintaining awareness, distancing responders out of harm's way, and allowing immediate site feedback. Current CBRNE response is human-based and incorporates hazard detection technology, GPS units and radios. Robots have been deployed for emergency response tasks including: urban search and rescue (USAR) and technological and natural disasters. The goal of such a system is to support fielded missions for social, economic and technological relevant problems.

CBRNE incidents vary dramatically based upon the hazard, incident size, and response duration, thus the required response activities vary significantly. A CBRNE incident may be a deliberate act or an accidental contaminant release. The incident response encompasses a large collection of individuals and associated equipment. The overall response relies on a structured hierarchy of responders who fulfill different responsibilities and employ face-to-face or radio communications.

Our initial objective was to understand the current CBRNE response based upon human responder activities. Our long-term objective is to design and upgrade the system by understanding the cognitive and physical demands of human response activities before developing the associated multifunctional robotic system technology.

The system should include the following: Integrated command and control centre on CBRN logistic intervention vehicle with decontamination tool kit, trailer and multifunctional robotic system for CBRNE application. This presentation is exploring more efficient use of robotics technology together with rapid responder:

- emergency preparedness enhancement
- reconnaissance and information collection, radiological and chemical detection and identification, monitoring and high resolution data delivery as well as possibility of high accuracy for detection and analysis from long range distance
- firefighting in high danger areas (terrorist site, fires with extreme high temperatures etc.
- object/obstacle removal on the path of intervention, removal and collection of objects .

- water supply in critical conditions
- mobility at great distress from safe distance (tracked vehicle)
- remote control from safe distance