



Supplement of

Development of a novel tool for automation of the contamination measurement

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Development of a novel tool for automation of the contamination measurement

Institute of Technology and Management in Construction

Deconstruction and Decommissioning of Conventional and Nuclear Buildings - M.Sc. Alena Wernke



www.kit.edu





- Goal: Set up an innovation laboratory/competence center (A maxim of 2 are funded nationwide)
- Duration: 06/2018 to 06/2022

Partners:

Project alliance of KIT, FZI and IOSB as well as outstanding research infrastructure and Living Labs for students, scientists and representatives from business and technology community







Operations of the KIT-TMB:









Autonomous Environmental Exploration and Radiation Measurement

Digitalization and Modelling using BIM Automated Decontamination

Automated Measurement of Surface Activity





Structure

- Necessity
- Requirements for the contamination array
- Sensor concepts and measurement procedure
- Outlook

Necessity





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*Optionally by means of in-situ measurement





ontamination measurement

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Necessity

"over 100.000 to 140.000m² of surface area must be decontaminated"^[1]

- Physical strain due to wearing personal protective equipment
- Monotonous work with little communication
- Low degree of automation
- Production of secondary waste

➔ Automated Contamination Measurements on Flat Wall Surfaces









Benefits

- Relief on employees and reduction of measurement errors
- Integration of automation and digitalisation for building decontamination and documentation purposes
- Minimising time, effort and costs



Preserving evidence in the course of the clearance

Requirements

- Automated detection of obstacles
- Parallel measurements with four contamination measuring systems
 - Automated starting of measurements from a control station
 - Automatic continuous monitoring of a predefined distance between the detector foil and the material to be measured

Automated storage of measured values for documentation purposes

Localisation in the room and building complex

→ Two Sensor Concepts: Measurement and Localisation













monitoring





Sensor concept - Localisation







Sensor concept – Measurement procedure



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Automatisierung der Messung der



neueCSVerstellen.m

- 🗄 📒 Mehrkanalgeraet
- 🗄 📒 Laserscanner

Dateinamen einlesen, damit die Daten zur richtigen Tabelle (CSV-Datei)

startProbenmessung.m (Script)

Nullpunktmessung

12





Current developments

Improvement of the real-time display for positioning the monitors in front of the measurement area to be examined





Current developments

- Improvement of the real-time display for positioning the monitors in front of the measurement area to be examined
- Integration of the sensors for localisation in real time in central software







Outlook

- Automation of the robot platform and development of a robust measurement process
- Minimisation of measurement times
- Modelling of radiation levels in a BIM Modell
- Demonstration in real/realistic environment

For more detailed information: <u>www.robdekon.de</u>

Robotersysteme für die Dekontamination in menschenfeindlichen Umgebungen



Federal Ministry of Education and Research

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THANK YOU FOR YOUR ATTENTION!

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