Fontys

> FOR SOCIETY

Remote Inspection with Low-cost robots

SIA Regieorgaan

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General Project Focus

- RILey is a project where we would like to accomplish technical challenges related to enable autonomous inspection for low cost robots in indoor our outdoor environments.
- In this project we would like to implement, improve and validate autonomous remote control of the SITA robot, that is provided by SITA Robotics, TMC and Avular are technology partners in this project. The project is funded by SIA.

Can we use the existing low-cost SITA robot, which is intended for remote-controlled reconnaissance, for autonomous inspection without substantially modifying the system itself?

Fontys UNIVERSITY OF APPLIED SCIENCES
SITA ROBOTICS TECHNOLOGY TO SAVE LIVES
TMC PEOPLE DRIVE TECHNOLOGY
Avular Building Imagination
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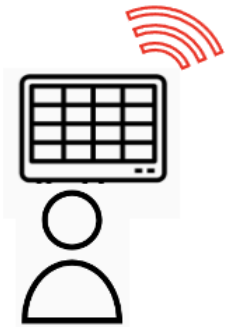
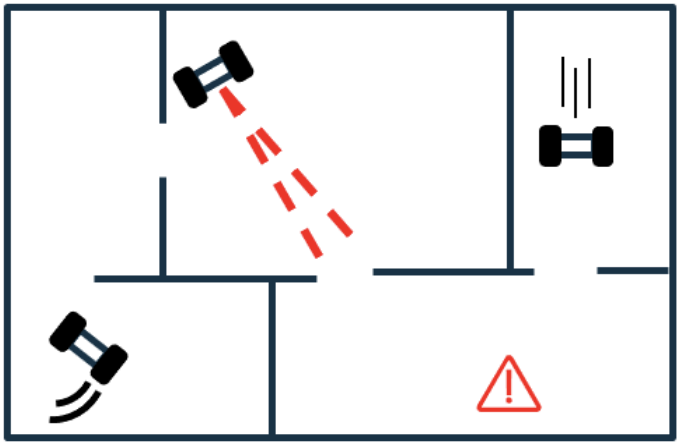
Impression SITA robot

https://youtu.be/FQI3ab9YWDU

Main focus for you

- How can you efficiently and autonomously scan a building using (multiple) remote controlled robots





Research

- **Sketch scenarios**
- **Analyze** the current status of the hardware and investigate the provided / needed technologies and solution.

- **Determine** if the provided technology is sufficient to perform the given task. Investigate the need and contribution of adding (smart) sensors, E.g., the use of a smart camera system (e.g. openmv-h7) or a small lidar could be beneficial for the project

- **Investigate** several methodologies that can be used for optimal area coverage to scan a building (e.g. there are biologically inspired techniques, or think of wall following techniques)

- **Investigate** how the system can benefit from multiple robots performing the same task at once

Design & Integration

- **Modify** the system based on your requirements and research findings
- **Create** a digital counterpart of the real robot, for this you need to make the URDF / 3D model of the robot that can run in ROS/Gazebo.
- **Integrate** the additional sensors on the real robot as on the simulated model.
- **Implement** the model in simulation and **validate** if it behaves the same as the real robot in the same scenario.
- **Test** and **validate** the added sensors
- **Implement** and **validate** the chosen scenario of the use-case
- **Implement** and **validate** the chosen building scan methods (single vs multi robot)