

Introduction

Motivation

Every day people are exposed to have some kind of accident and the worst kind of accidents are those that put the lives of people in danger. What if the firefighters are supported by rescue robots? With the use of rescue robots that explore the accident area and provide information to the firefighters. In this work, we try to enable rescue robots to explore buildings with the use of LiDAR systems and 3D models of the buildings.

Challenges and Difficulties

Most of the registration algorithms are focused on working for two point clouds. Just a few registration algorithms are able to handle more than two point clouds.

The registration process is normally done manually, due to the fact that it is a simple task for a human since we all have a 3D visualization of the point clouds.

An additional challenge is the data itself, the point clouds used to test the registration process.

At the time this work was started, there was no GPS information of the point clouds used in the registration, just a 3D visualization of the point clouds.

Problem Statement This work intends to implement an automated registration method for a point cloud with a CityGML model.

[H] [width=]images/Systemaufbau.png A-DRZ architecture system.

The current automated approaches are mainly focused on point-to-point registration. Therefore, the exploration of the point cloud is a challenge.

Figure ?? shows the general workflow of the needed method. The input of the method is a point cloud together with a CityGML model.

[H] [scale=0.5]images/RegistrationProcess System diagram.

Firstly, the implementation will be tested individually. Secondly, the implementation will be tested with its integration into the A-DRZ architecture.