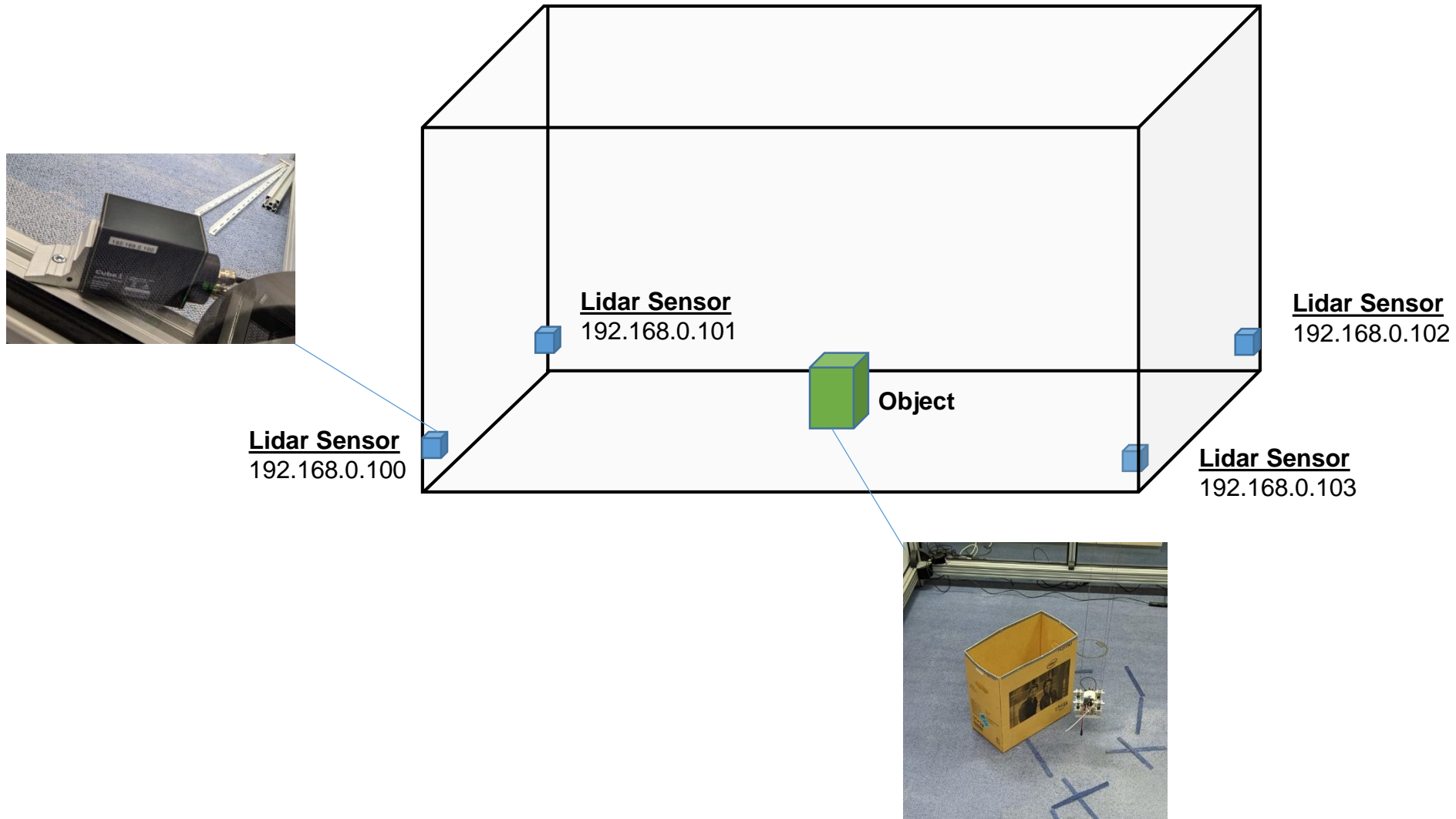# LIDAR Project Description
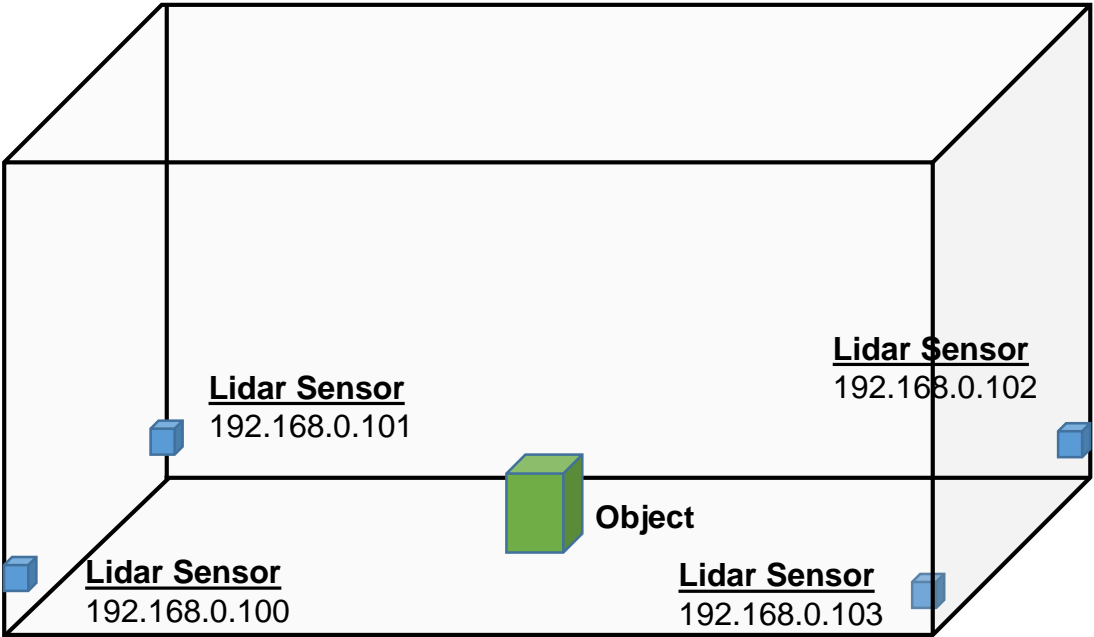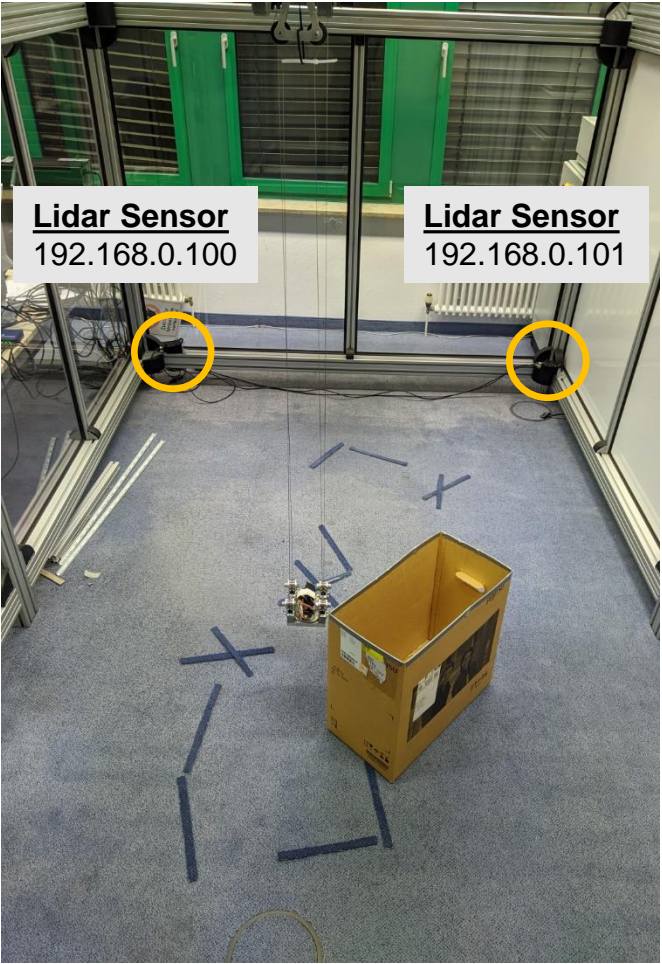
Andreas Gienger, M.Sc.
Anja Lauer, M.Sc.

Overview of test bench for LIDAR Sensors

Lidar Sensor
192.168.0.101

Lidar Sensor
192.168.0.102

Object

Lidar Sensor
192.168.0.100

Lidar Sensor
192.168.0.103

Overview of test bench for LIDAR Sensors - *Point of views*

Point of view 1 (pov1.jpg)

Lidar Sensor
192.168.0.100

Lidar Sensor
192.168.0.101

Point of view 2 (pov2.jpg)

Lidar Sensor
192.168.0.102

Lidar Sensor
192.168.0.103

Lidar Sensor
192.168.0.101

Lidar Sensor
192.168.0.102

Object

Lidar Sensor
192.168.0.100

Lidar Sensor
192.168.0.103
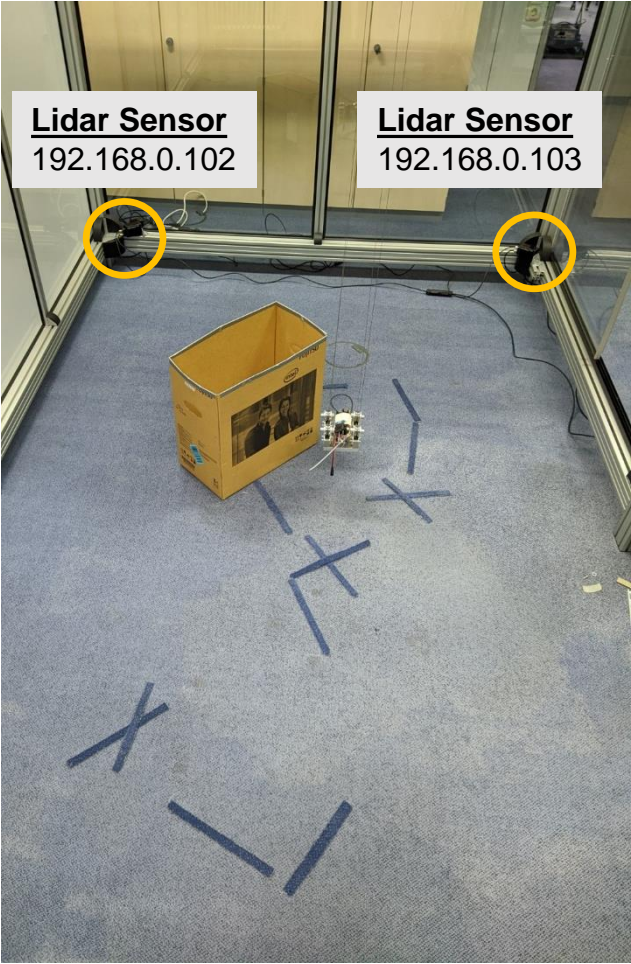
Goal – *Fusion of LIDAR Data to reconstruct point cloud of 3D object*

Point cloud from 192.168.0.101

Point cloud from 192.168.0.102

Point cloud from 192.168.0.100

Point cloud from 192.168.0.103

**3D point cloud of object**
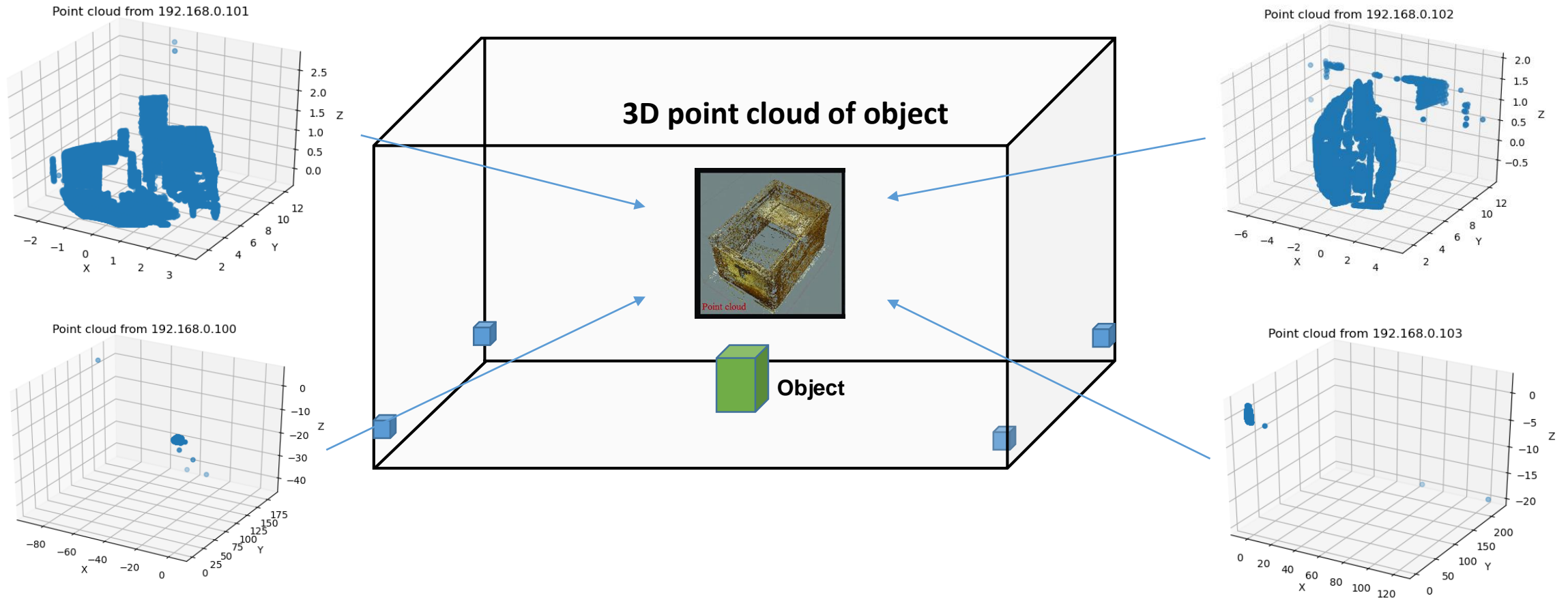
Object

Goal

Fuse 3D point cloud from four LIDAR Sensors with different orientations to obtain 3D point cloud of object

First Steps

1. Literature Review on point cloud fusion and segmentation algorithms

2. Evaluation of existing implementations of algorithms on the different datasets

Things to be considered

- There exist outliers in some datasets

- In the end, the point cloud of the object should be extracted – point cloud segmentation necessary?

- No information about the position of the LIDAR Sensors are available

outliers

IntCDC
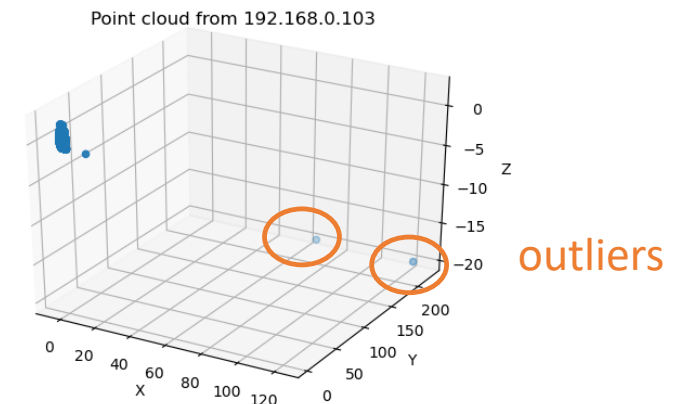
File and Dataset Structure

The different datasets in the corresponding folders contain different objects or position/orientation of objects

Name	Änderungsdatum	Typ	Größe
boxBinBrickets	26.11.2021 12:59	Dateiordner	
boxPosition1	26.11.2021 12:55	Dateiordner	
boxPosition2	26.11.2021 12:59	Dateiordner	
chair	26.11.2021 12:59	Dateiordner	
crane	26.11.2021 12:59	Dateiordner	
rubishBin	26.11.2021 12:59	Dateiordner	
rubishBinWithBricks	26.11.2021 13:00	Dateiordner	
twoBricks	26.11.2021 13:00	Dateiordner	

Each folder contains pictures of the point of views (pov1.jpg and pov2.jpg), .csv files from each LIDAR sensor (the number in the file name corresponds to the IP-address) and scatter plots of the point clouds for each LIDAR sensor (.png)

Name	Datum	Typ	Größe
boxBinBrickets_1921680100.csv	25.11.2021 18:04	Microsoft Excel-C...	1.241 KB
boxBinBrickets_1921680101.csv	25.11.2021 18:04	Microsoft Excel-C...	1.055 KB
boxBinBrickets_1921680102.csv	25.11.2021 18:04	Microsoft Excel-C...	1.242 KB
boxBinBrickets_1921680103.csv	25.11.2021 18:04	Microsoft Excel-C...	1.169 KB
boxBinBrickets_pointCloud_1921680100.png	25.11.2021 18:04	PNG-Datei	58 KB
boxBinBrickets_pointCloud_1921680101.png	25.11.2021 18:04	PNG-Datei	65 KB
boxBinBrickets_pointCloud_1921680102.png	25.11.2021 18:04	PNG-Datei	66 KB
boxBinBrickets_pointCloud_1921680103.png	25.11.2021 18:04	PNG-Datei	70 KB
pov1.jpg	26.11.2021 11:42	JPG-Datei	617 KB
pov2.jpg	26.11.2021 11:42	JPG-Datei	637 KB

The .csv file contains the x-,y- and z-coordinates of the points

```
1   X,Y,Z
2   -1.5023219585418701,2.104776620864868,-0.004074986092746258
3   -1.4940568208694458,2.124992847442627,-0.0042397291399953852
4   -1.5136010646820068,2.18756103515625,-0.004486574325710535
5   -1.4753185510635376,2.166459560394287,-0.004557925276458263
6   -1.4599449634552002,2.176848888397217,-0.004688273184001446
7   -1.473463535308838,2.233536720275879,-0.004927152767777443
8   -1.471977949142456,2.2671875953674316,-0.005114562809467316
9   -1.4599043130874634,2.2842578887939453,-0.005260936915874481
10  -1.4385141134262085,2.2885656356811523,-0.005378267727792263
11  -1.4303473234176636,2.312072277069092,-0.0055358572863042355
12  -1.4139095544815063,2.3221607208251953,-0.00566070480272721739
```