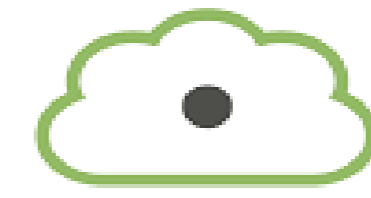


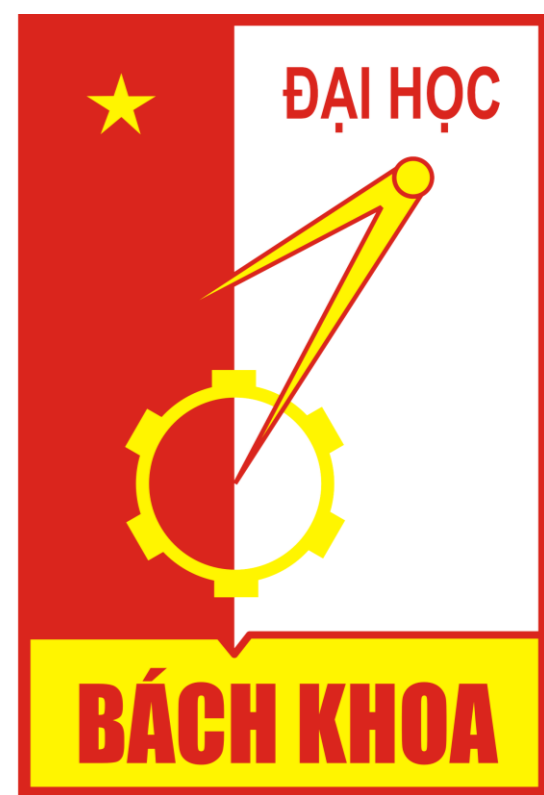
# 3D Indoor scanning & map building

Sander Vanspauwen

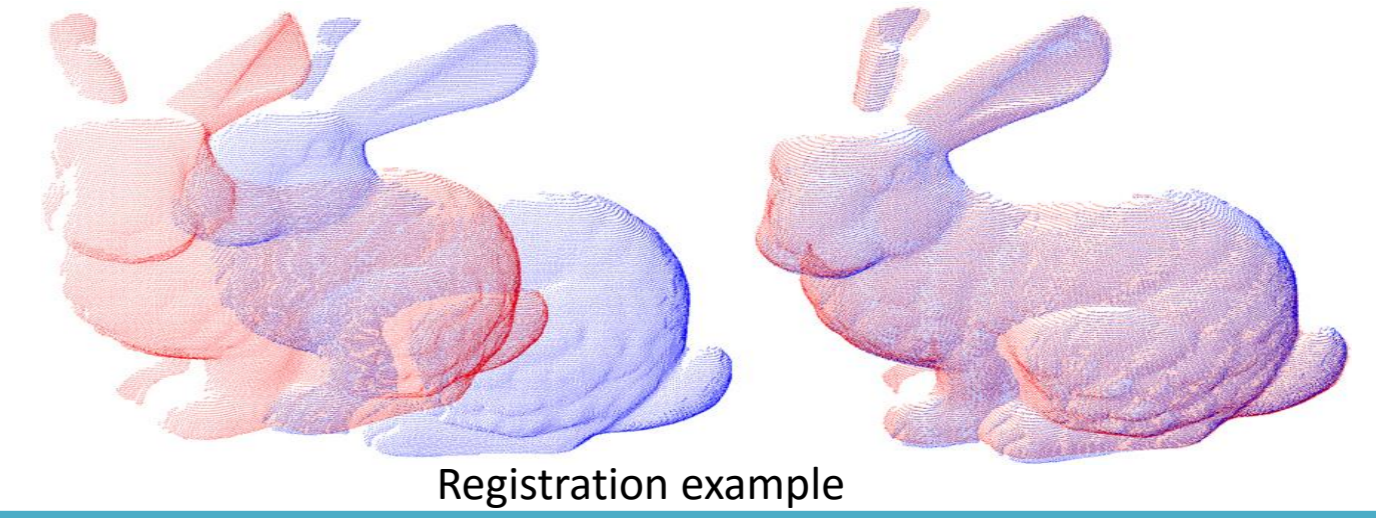
Master Automation of Energy Engineering Technology



pointcloudlibrary



## 3D Technology



### Background

### Problem

### Objectives

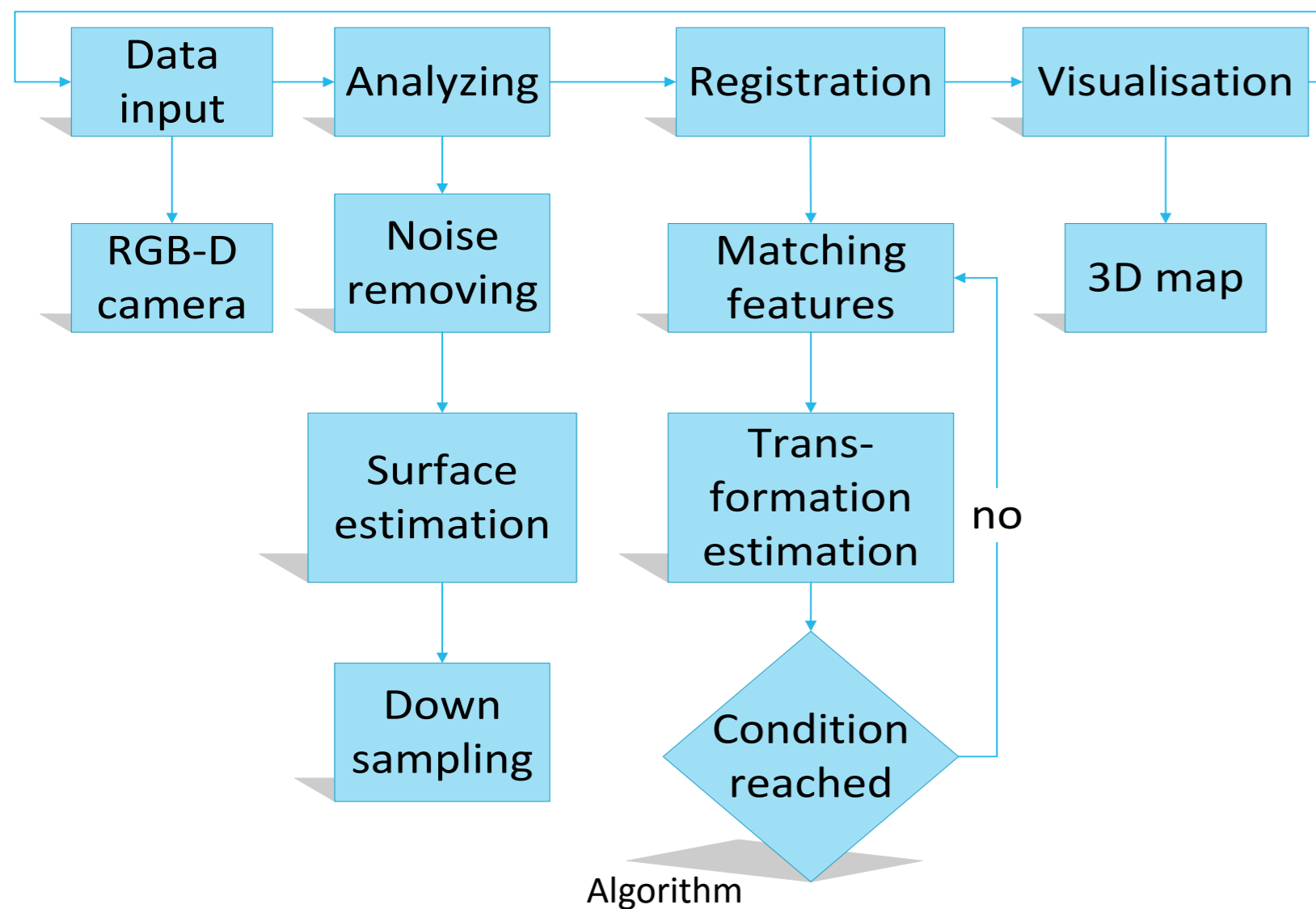
3D technology is used in:

- Transport
- Navigation
- Robots
- 3D object scanning
- ...

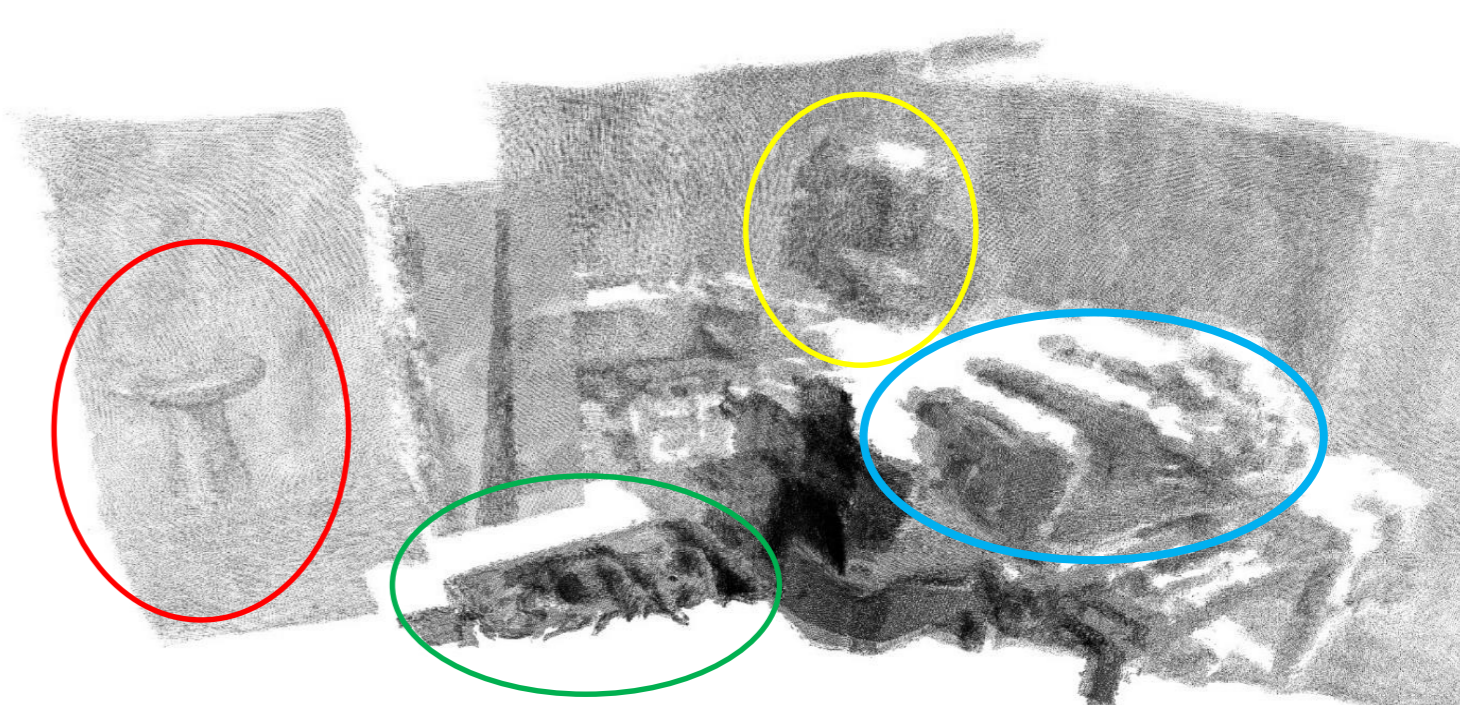
More accurate information is needed from the environment in real time

Create an algorithm that creates a real time 3D map by making use of a camera and point clouds

### Methods & Algorithm



### Results

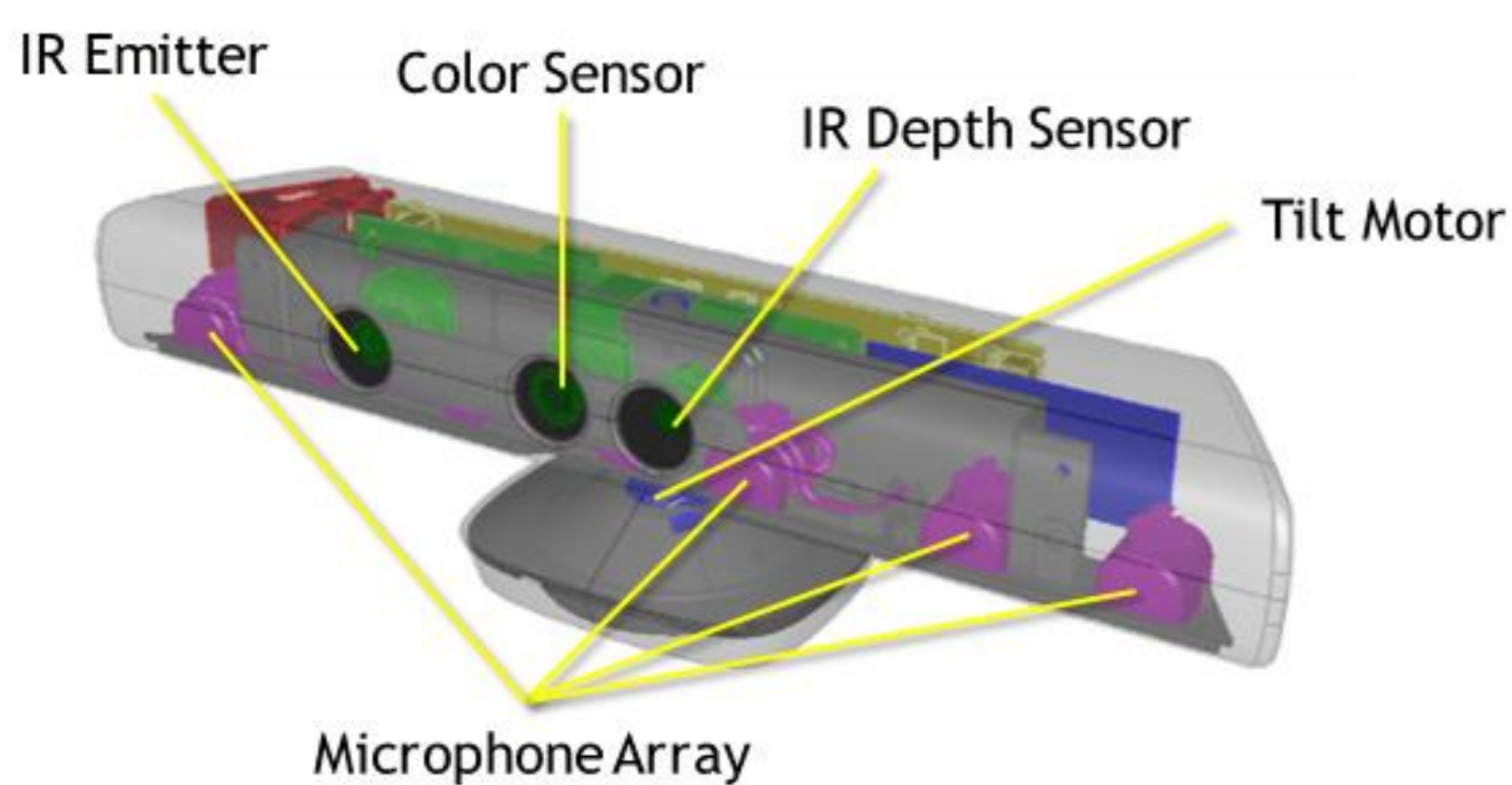


Registration example

- 450 ms aligning 2 point clouds
- 700 ms map updating

- Persistent alignment error
- 3D map appears blurry & shifted

### Hardware



Construction of RGB-D camera

### Plans for the future

- Improve the algorithm
- Tests with different hardware
- Body scanner
- Object scanner
- Automated self driving robot
  - A\* path planning
  - 3D mapping

### References

- Dirk Holz, A.-E. I. (2015). *IEEE Robotics and Automation Magazine*. Retrieved March, April, May 2017, from [http://lgg.epfl.ch/~ichim/registration\\_tutorial\\_ram\\_2015/data/registration\\_paper\\_tutorial\\_ram\\_2015.pdf](http://lgg.epfl.ch/~ichim/registration_tutorial_ram_2015/data/registration_paper_tutorial_ram_2015.pdf)
- Rusu, R. B. (2011, March). *PCL (Point Cloud Library)*. (Open Source) Retrieved March, April, Mai 2017, from <http://pointclouds.org/>

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