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# Improving MS Kinect's 3D resolution by controlled relative movement of the sensor and the object

Keywords: Kinect, 3D sensor, Primesense, 3D resolution, triangulation, pseudo pattern

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## Abstract

MS Kinect has a low 3D resolution if the sensor is in a static position. However, the 3D resolution of the sensor can be improved by slight movements of the device or the object. The influence of the sensor's/object's movement in different directions on the generated 3D data need to be investigated and described. An optimal movement strategy needs to be elaborated.

## Introduction

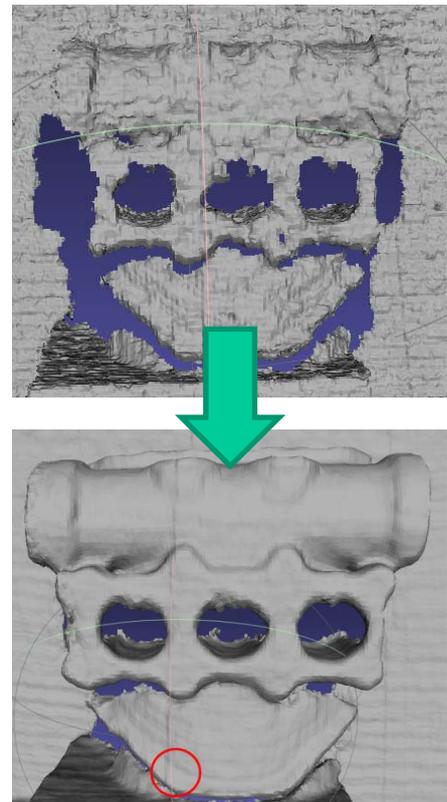
MicroSoft's Kinect 3D sensor relies on Primesense's active triangulation solution: a pseudo random (point) pattern is projected by an infrared laser on the object's surface and it's image is captured by an infrared camera located offset the projection unit. From the distorted image of the pattern the 3D geometry of the object surface can be calculated. The 3D coordinates can be measured only in a limited number of points where the laser dots illuminate the object's surface. By moving the sensor or the object the number of the laser illuminated dots can be increased, thus more point's 3D coordinates can be measured. The increasing number of collected 3D data improves the resolution and the quality of the measurement.

## Content of the work

The influence of the relative movement between the sensor and object on the measured 3D data in different directions needs to be investigated and a mathematical model of the measurements needs to be developed. Experiments to validate the mathematical model must be designed and executed. A measurement setup needs to be built that enables the controlled relative movement between the sensor and object according to the designed experiments.

## Work packages

- Literature research in topics of active triangulation and Kinect
- Elaboration of an evaluation method for the 3D measurements
- Design of experiments
- Building a test measurement setup for the controlled sensor/object movement
- Test measurements + evaluation of results
- Final presentation + documentation



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## Informationen & Administration

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