#### Introduction

Having a detailed surface reconstruction of an object is very valuable in for example geometric modeling, to store an art piece for the future or to scan real objects to use in computer graphics such as 3D drawings, computer games etc..

### Imaging Robot

The imaging robot is an industrial robot from ABB Robotics with an interface designed for performing imaging tasks. A camera, laser or STL scanner can be mounted on the robot.  $\rightarrow$ 



# **3D SURFACE SCANNER USING STRUCTURED LIGHT & INDUSTRIAL ROBOT**

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# Structured Light Scanner

The Structured Light Scanner consists of two cameras and a projector. The setup uses two Point Grey cameras, and a pico projector which makes is so small that its mountable on the Imaging Robot arm. $\rightarrow$ 





## **3D Surface Scanner**

Mounting the STL scanner on the robot gives the potential for approximately full surface scan of complex objects.

Moving the STL scanner around the object and recording the exact positions and directions of the scanner and the generated point clouds. Then it is possible to combine all the point clouds to one full surface point cloud.



**T** Capturing datasets and generating point clouds from multiple angles. Recording all the positions and rotations of the scanner.

#### **IMM INDUSTRIAL ROBOT**





#### HOW IT WORKS

POINTCLOUD

(x,y,z) (rx,ry,rz)





Rotating, moving and  $\mathbf{T}$ combining point clouds.

**ROBOT COMPUTER** 



Imaging Robot | Bachelor Project 2010 Structured Light Scanner | Special Course 2011