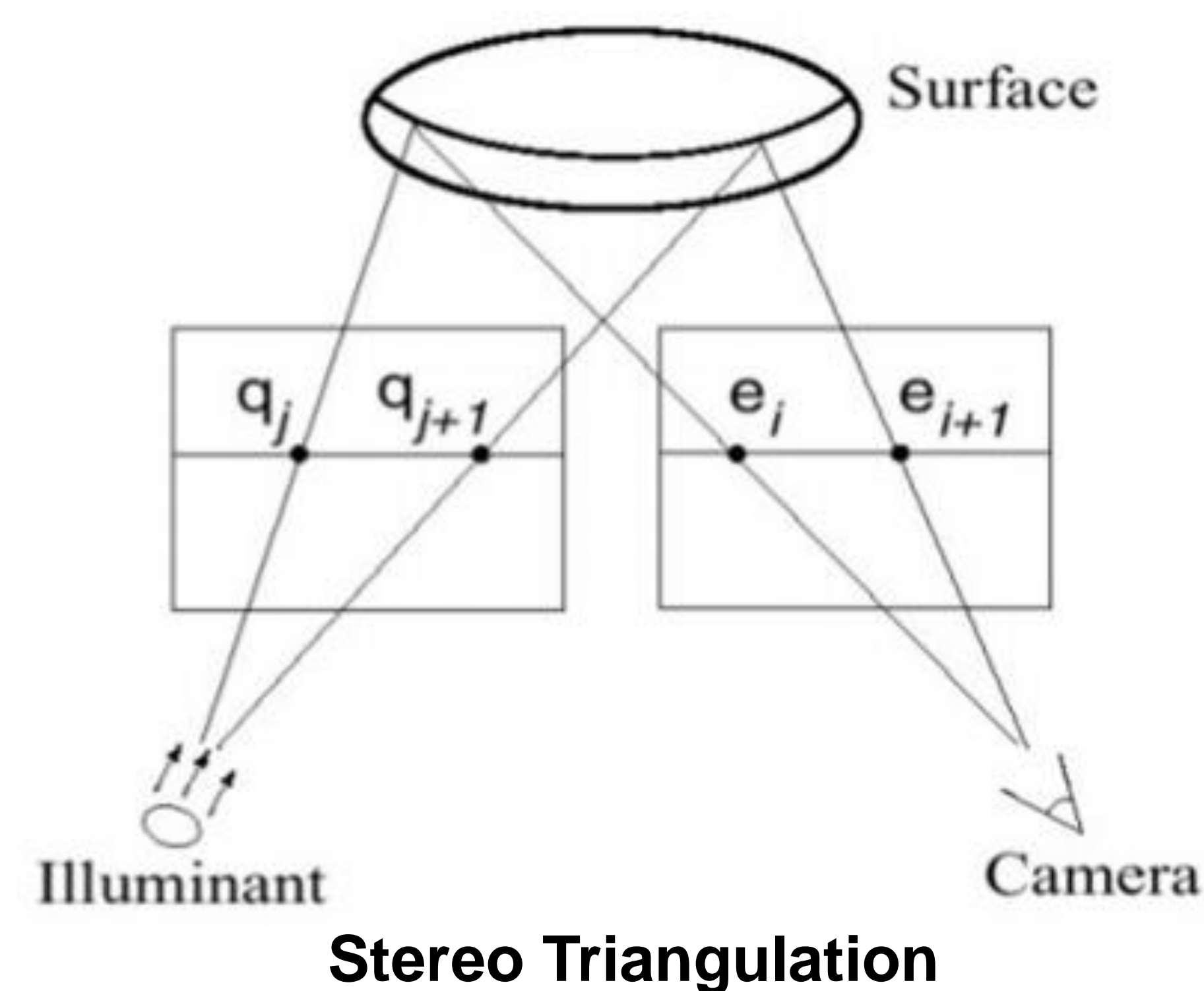


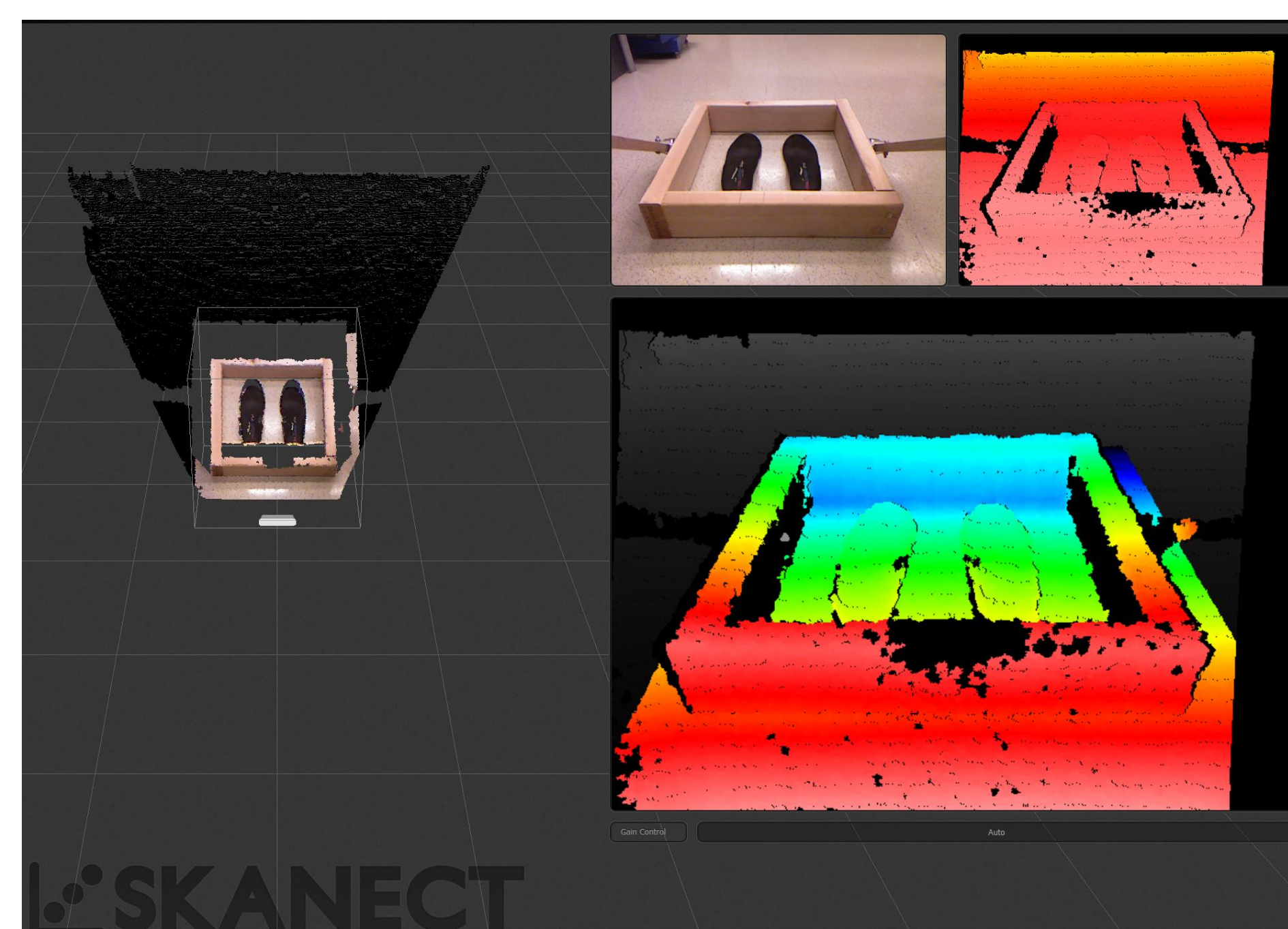


# Use of an Xbox Kinect™ as a 3D Scanner

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IR Speckled Pattern



Depth Detection in SKANECT

## Abstract

This report examines the function, accuracy, and ease of use of an XBOX Kinect™ as a 3D surface scanner. The purpose of this experiment is to demonstrate the utility of a Kinect™ for XBOX 360 (Microsoft®) paired with Skanect (Occipital) and MeshLab software packages as a low cost solution to surface scanning and processing. My conclusion is that the Kinect™ is able to accurately model the recorded point cloud as a continuous 3D surface that matches the contour and scale of the test subject surface. Both Skanect and MeshLab effectively interpolated the smoothing of the 3D surfaces and provided higher resolution imaging than an unaltered image. The resultant resolution of the contoured surface is higher than the resolution of the 3D printers used in this experiment, demonstrating an effective digital duplication of a physical surface.

## Background

- Design a new method of custom insole production based upon the work of Alan Hood from the Center for Postural Correction
- Using a digitally reconfigurable platform, create a standing surface that matches a patient's ideal plantar contour.
- Record the shape of this surface using a 3D scanner.
- Current insole-making techniques
  - Plaster Casting
  - Foam Box Impressions
  - Digital pressure scanning
- Kinect Applications
  - Indoor 3D mapping
  - Sewer manhole reconstruction
  - Combination of features

## Experimental Procedures

- Two scans performed
- Cropping and smoothing in SKANECT
- Smoothing and analysis in MeshLab
- 3D printing and analysis

## Analysis

- Quantitative analysis of the effects of editing on the number of faces and vertices.
- Qualitative analysis of the appearance of the mesh and the physical quality of the 3D prints, evaluating for scale, curvature, and smoothness.

## Total Cost

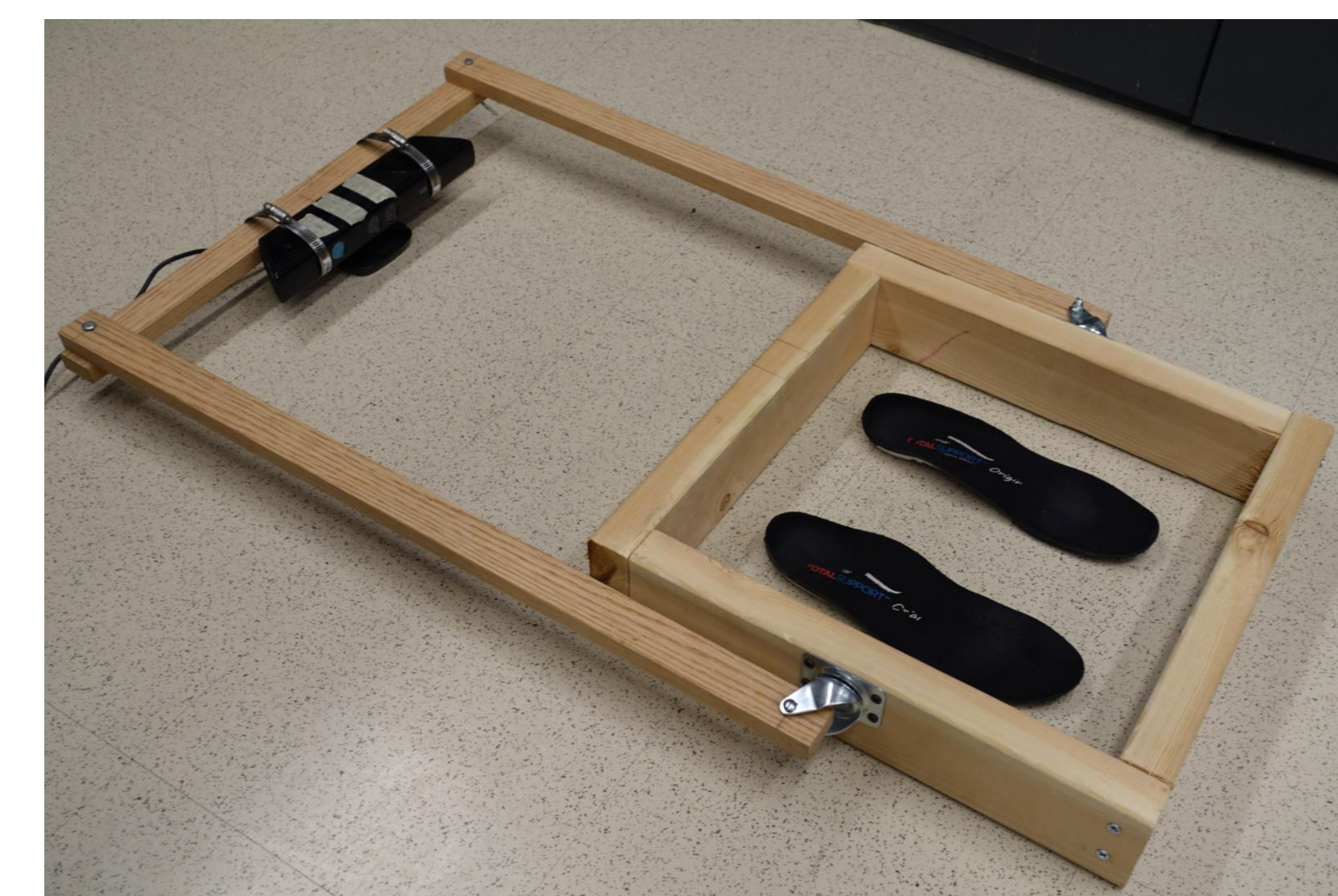
**\$191**

## Conclusions

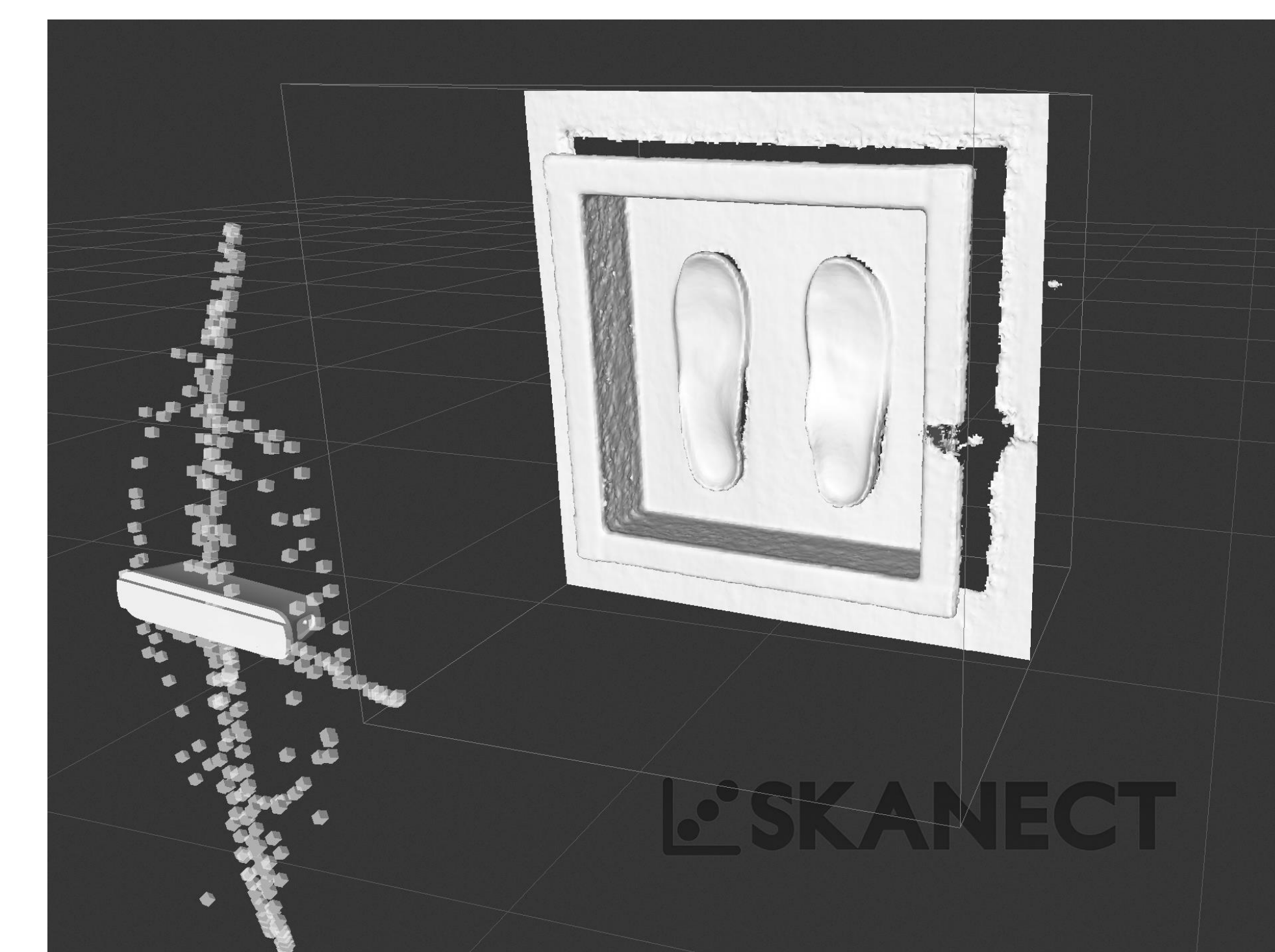
- High resolution images
- Good dimensional accuracy & scale
- Simple process
- High benefit/cost ratio
- Possibility of automation



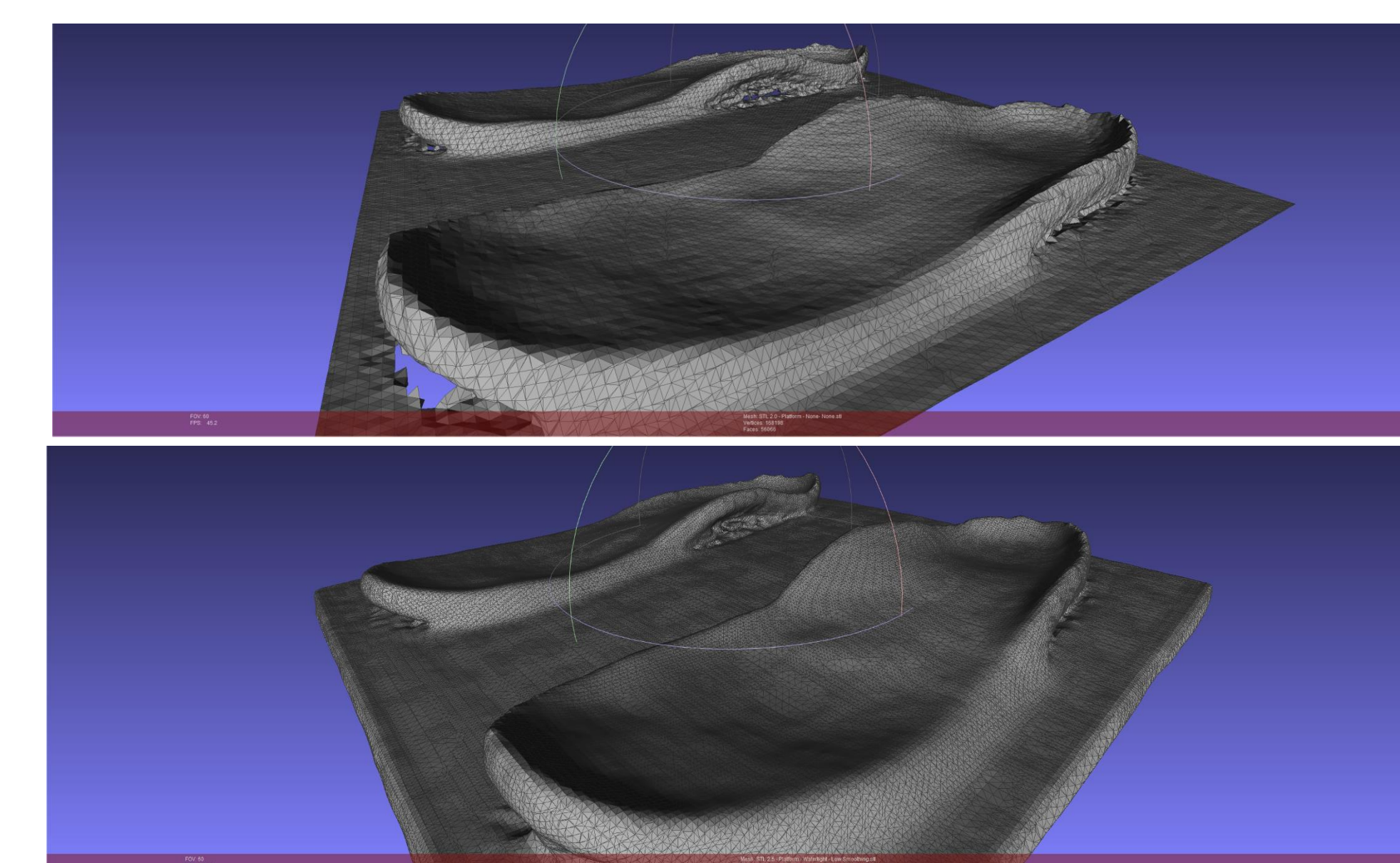
Using an Xbox Kinect and two software packages, I build a 3D scanner capable of capturing high resolution 3D images of plantar contour. This technology can be used in the manufacturing of custom orthotic insoles.



Scanning Platform with Surface Template



Raw Surface Scan in SKANECT



Unedited and Edited Image Files