



## 3D SCANNING FOR SCIENTIFIC RESEARCH

👉 A structured-light 3D scanner created a digital 3D model of a dolphin skull for measurement analysis. View the model in 3D at [www.gomeasure3d.com/skull](http://www.gomeasure3d.com/skull)

3D scanning is an efficient method for data collection and statistical analysis of complex forms. By examining the 3D measurements of an organism's biological structure—its shape and size—information can be inferred about a specimen's genetics, environment, evolutionary changes, and how it lived. This technology is ideal for comparative studies by referencing a set of common **anatomical landmark points** (digital 3D coordinates). 3D scanners make it easy for researchers to compare these coordinates across organisms to see how they relate or differentiate from one another.



👉 3D scanners are great as 3D measurement solutions to capture surface information of complex forms.

### BENEFITS OF 3D SCANNING

#### 1 Scan = > 1,000,000 3D Measurement Points Per Second

Quickly capture precise 3D measurements of an object so you can spend more time analyzing rather than on the data collection process.

#### Analyze Data with More Complexity

Analyze multiple planes simultaneously and superimpose data to get a better understanding of the similarities and differences between specimens.

#### No Measurement Interference

Structured-light 3D scanners capture 3D measurements without any physical contact. This is especially important when specimens are delicate and fragile to touch.

#### Accurate Results Every Time

Generate 3D measurements with repeatable results even when different operators use the equipment.

#### Easy to Operate with Basic Training

Researchers can learn to use a 3D scanner relatively quickly for daily use with basic training.

# Case Study: 3D Analysis of Facial Morphology

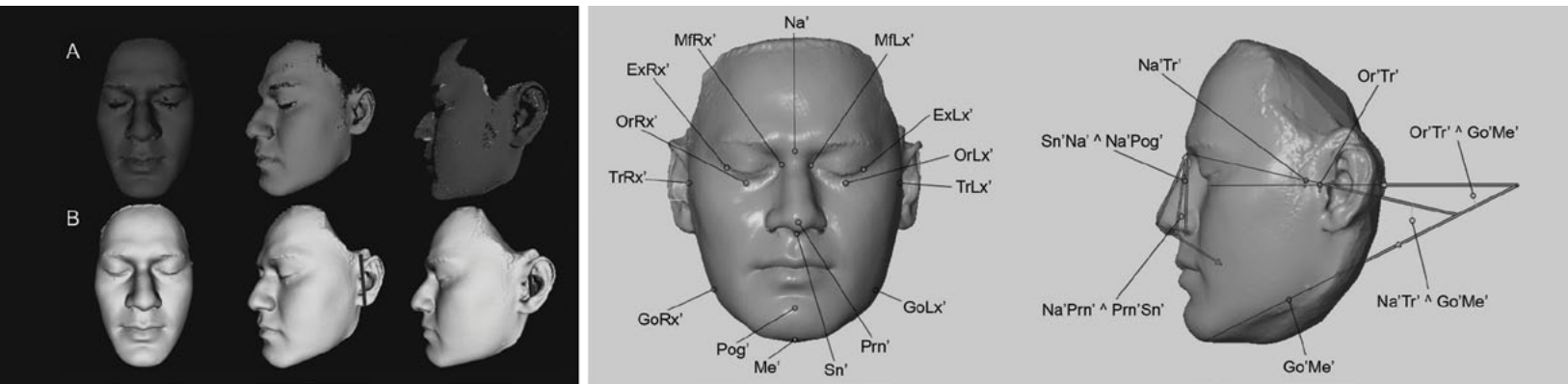
Researchers at the University of Otago (New Zealand) in partnership with the University of Naples (Italy) used 3D scanning as a non-invasive procedure to collect measurement data to investigate the differences in facial morphology of Māori and New Zealand European adults.<sup>1</sup>

## PURPOSE OF THE STUDY

Māori people are indigenous Polynesian people of New Zealand. Māori patients are often inappropriately treated using Caucasian norms, despite obvious differences in facial morphology. By examining and comparing the physical similarities and differences of facial anatomical landmarks between these two groups, researchers can use data to determine if there are statistical differences.

## SCANNING FACES INTO 3D MODELS FOR ANALYSIS

30 Māori and 30 New Zealand Europeans closely matched in gender and age participated in the study. For each participant, 12 facial scans were captured using the **HDI Advance 3D scanner** at different angles. The scans were later merged together to form a complete digital 3D model. Researchers conducted various statistical analyses using the scanned data.



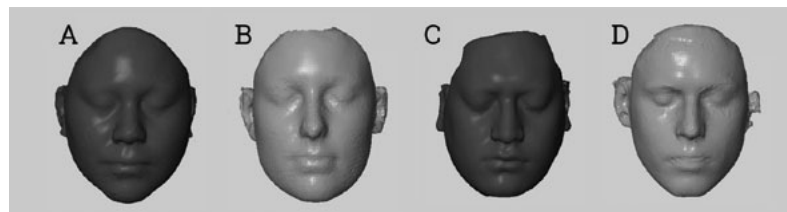
**Left image:** Reconstruction of the participant's face in 3D digital form.  
**Right image:** 19 facial measurements act as variables for comparison between the two groups.

## STUDY RESULTS

3D scanning empowered the researchers to use the data to reconstruct the 'average' Māori and New Zealand European faces by merging the 3D faces in each group.

Scientific evidence demonstrated that Māori participants generally had larger facial measurements compared with New Zealand Europeans. Māori have unique facial features that resemble historical Polynesian skulls. These distinctive features may reflect important differences in environmental and genetic influences between the two populations.

Read the full report at [www.gomeasure3d.com/study](http://www.gomeasure3d.com/study)



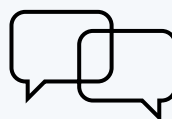
**Average reconstruction of faces:**  
A. 15 Māori females      C. 15 Māori males  
B. 15 New Zealand females      D. 15 New Zealand males

<sup>1</sup> Source: Research report, A three-dimensional evaluation of Māori and New Zealand European faces, November 2014

## ABOUT GOMEASURE3D

We are a provider of affordable 3D scanning and measurement systems that transform real world objects into digital 3D models for use in various industry applications. We deliver simple and effective solutions that enhance productivity and improve product quality.

## CONTACT US



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