

Development of a medical device to visualize abnormalities in the 3D surface morphology of the skull as a color map

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Project Outline

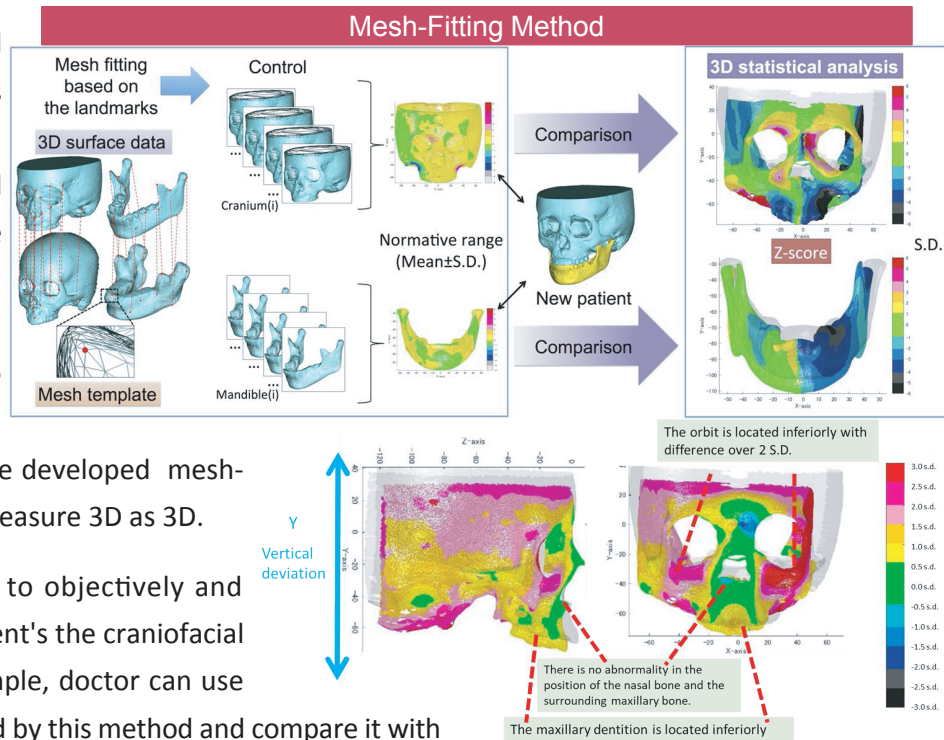
Recently, X-ray computed tomography (CT) image is gradually being used in measuring the craniofacial structure. However, it have yet gone beyond than extracting distance information and compare it with normative range.

With this back-ground, we developed mesh-fitting method that can measure 3D as 3D.

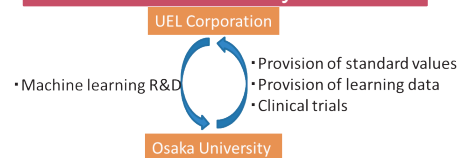
This makes it possible to objectively and visually evaluate the patient's the craniofacial structure in 3D. For example, doctor can use homology model obtained by this method and compare it with normative range. As shown in figure on the right, parts with large difference (e.g., those with difference over $\pm 1s.d.$) can be easily recognized with color map. Then in surgery, abnormal parts can be moved to the normative range.

However, there is a bottleneck in generalizing this method. The bottleneck is the cumbersome manual input of biologically-meaningful points (landmarks), which is important for mesh-fitting method. This project, in collaboration with UEL Corporation, aims to solve this problem by machine learning and then develop a medical devices.

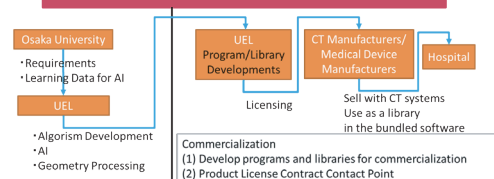
This patent enables us to develop an "objective evaluation system for head and face shape", which would be useful for clinicians.



Joint Study



Assumed business model



- **Joint Study** UEL Corporation
- **Patent** Japanese published patent application 2019-163518 (application date: Sep/9/2019)
- **Target** Orthodontic patients / Sleep-related disorders / Endocrine disorders / Plastic surgical disorders
- **Profit** Sell as an "objective evaluation system for head and face shape" with the standard range data