



Graduate School of Dentistry
OSAKA UNIVERSITY



Center for Global Oral Health
Osaka University

INTERNATIONAL RESIDENT TRAINING COURSE IN

Objective three-dimensional analysis of cranio-
facial morphology

and

AI application to orthodontics

Dept. of Orthodontics and Dentofacial Orthopedics

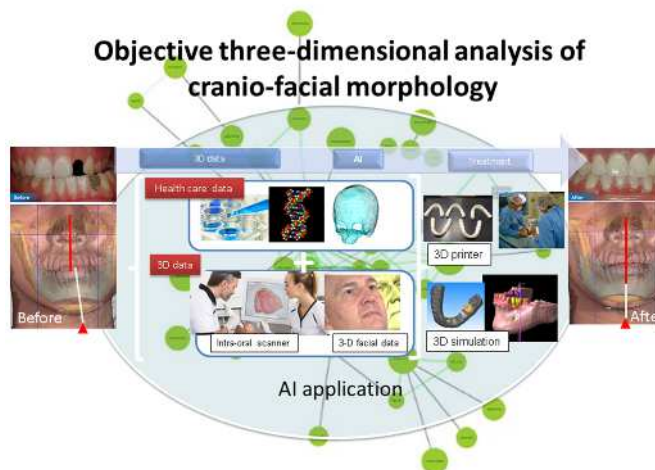
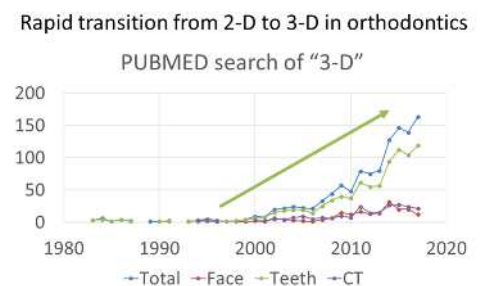
OSAKA UNIVERSITY DENTAL HOSPITAL

MAIN COURSE TITLE: Objective three-dimensional analysis of cranio-facial morphology and AI application to orthodontics

TRAINING NEEDS

Recently, three-dimensional (3-D) technologies (e.g., 3-D facial images, 3-D digital models, 3-D cranial models, and 3-D printing) have emerged in orthodontics. Over the past ten years, there has been a rapid transition from 2-D cephalometrics toward 3-D cone-beam CT imaging and 3D dental/facial models. Nowadays, the use of 3-D technologies as a means of objectively evaluating the craniofacial topography for diagnosis, treatment planning, and assessment of orthodontic outcomes is on the rise.

Although there is a growing consensus that the use of 3-D imaging technologies or 3-D printing will be one of the next major technological revolutions in orthodontics, a bottleneck in the clinical setting is 3-D data management: 3-D data is often too complicated to manage in clinics. To overcome this problem, we have applied an artificial intelligence (AI) for 3-D data management. We expect that this AI application for management of 3-D data will simplify use of 3-D technologies in the clinical settings.



COURSE OBJECTIVES

Over the course of training, participants will be expected:

- 1) To understand the nature of 3-D data (DICOM, STL)
- 2) To use various 3-D data and 3-D apparatus (CBCT, facial 3-D images, intraoral scanner)
- 3) To understand the application of artificial intelligence (AI) systems to 3-D data
- 4) To understand the use of 3-D printers

NUMBER OF PARTICIPANTS

6

LANGUAGE

English

REQUIREMENT FOR APPLICATION

Applicants should:

1. be graduates of a university-level dental or medical school,
2. be staff members (teaching and/or research) of a dental or medical school, or equivalent institution, e.g. dentists, or doctors specializing in dentistry,
3. have served at university or equivalent institution for over three years,
4. be at present specializing in orthodontics, or hereafter intending to specialize in orthodontics,
5. have a sufficient command of spoken and written English,
6. be in good health, both physically and mentally,
7. not be serving in the military.

TRAINING INSTITUTION

Department of Orthodontics and Dentofacial Orthopedics
Osaka University Dental Hospital
1-8 Yamadaoka, Suita, Osaka 5650871 JAPAN

LOCAL COSTS and ACCOMMODATIONS

Local costs, such as accommodation, meals, and other personal expenses shall be the responsibility of each participant.

COURSE FEE

340,000 JPY (It does not include national/local consumption taxes.)

NOTES

The Faculty of Dentistry was established in 1951 as the first dental school among Japan's national universities to promote both instructor training and research in dental science and dental health education. The Graduate School was established in 1960.

Sixty students are accepted by the Faculty of Dentistry each year. The students pursue three semesters of pre-dental general education on the Toyonaka Campus, followed by nine semester of basic and clinical dental science in the Faculty of Dentistry and the Dental Hospital on the Suita Campus (total six years).

The faculty building on the Suita Campus was completed in 1983. It has been designed to accommodate a full program of education, research and patient care, and provides laboratories as well as clinical and classroom facilities for the Dental School and the Graduate School.

At present, the Faculty of Dentistry comprises academic 22 chairs and a Research Resources Center: 8 chairs for basic dental science and 13 for clinical dental science.

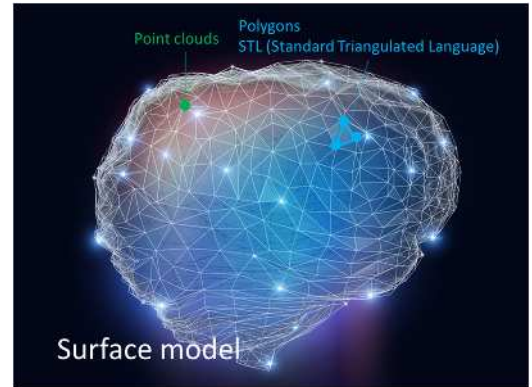
TIMETABLE

Day 1

AM: 9:00-11:00 Orientation

AM: 11:00-12:00

Lecture of the basic knowledge of the 3-D data and 3-D apparatus



Lunch

PM:

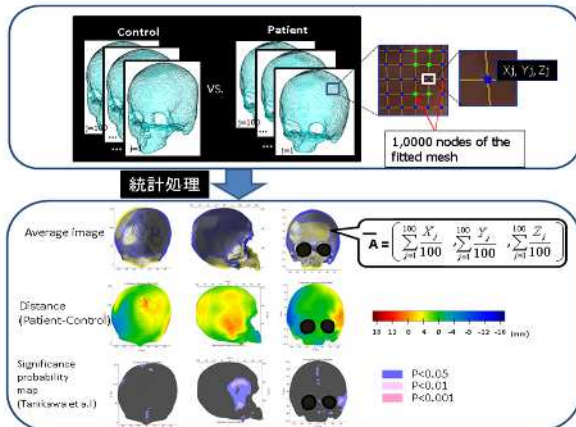
Practical trainings of the taking the 3D facial images (Vectra, 3dMD),

Practical trainings of the taking the intra-oral images

Practical trainings of orthodontic set-up models

Welcome dinner

CBCT analysis training course



Day 2

AM:

Lecture of the mathematical computing of the 3D data

Practical trainings of the superimposition of the CT data and 3-D facial images, prediction of the orthognathic surgery

Lunch

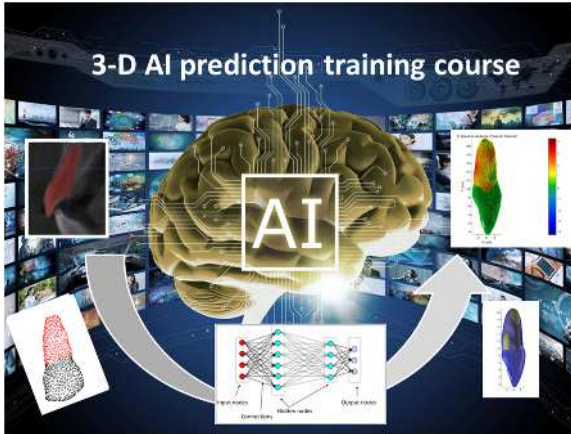
PM:

Campus tour

Lecture of the 3-D printings
Practical trainings of the printing out of the surgical splint
(Mimics and Dolphin system)

3-D printer training course





Day 3

AM:

Lectures of the application of the artificial intelligence (AI) system to the 3-D data

Lunch

PM:

Basic knowledge of AI system

Day 4

AM:

Facial simulation of the orthodontic extraction cases/

Objective assessment of the facial, dental, and cranial morphology.

Lunch:

PM:

Present and the future of digital orthodontics

15:00~15:30 Closing Ceremony