Comparison between Conventional Visual and a Novel Digital Technique to Grade Dental Anatomy Projects

So Ran Kwon, DDS, MS, PhD, MS
Department of Operative Dentistry
University of Iowa College of Dentistry & Dental Clinics

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THE UNIVERSITY OF IOWA

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- Co-authors: Natalia Restrepo-Kennedy, DDS, MS
  Deborah V. Dawson, PhD, Sc.M
  Marcela Hernandez, DDS, MS
  Gerald Denehy, DDS, MS
  Derek Blanchette, BA, MS
  David Gratton, DDS, MS
  Steve Aquilino, DDS, MS
  Steven R. Armstrong, DDS, PhD, FADM

The University of Iowa

Dental Anatomy

The study of the development, morphology, function, and identity of teeth in the human dentitions, as well as the way in which they relate in shape, form, structure, color, and function to the teeth in the same dental arch and to the opposing arch.

WheelerÕs Dental Anatomy, Physiology, and Occlusion-Nelson and Ash

Dental Anatomy at UI

2014

- 12 weeks course for freshmen
- Complete 4 full tooth waxing

  projects (#9, 4, 14 & 19)
- Knowledge of dental anatomy and terminology
- Psychomotor skills
- Self-evaluation skills

Visual Evaluation

- Evaluation using pre-established check list
- Subjective evaluation
- Intra/Inter rater reliability
- StudentsÕ feedback

(Lilley et al, 1968; Jenkins et al, 1998; Haj-Ali et al, 2006; Sharaf et al, 2007)

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Check-list for Dental Anatomy Grading

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Evaluator name:

Evaluation date and time:

Dentoform Random Number:

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Contact, line angle & embrasure

	CORRECT	ERROR
Mesial contact	visual contact, correct width and position	wide narrow too occlusal too gingival too facial too lingual irregular light missing
Distal contact	visual contact, correct width and position	wide narrow open wrong location too facial too lingual irregular light missing
MB embrasure	normal contour	closed open irregular
MB line angle	normal position and shape	malpositioned sharp rounded
MO embrasure	normal contour	closed open irregular point angle sharp-round
MG embrasure	normal contour	closed open irregular
DB embrasure	normal contour	closed open irregular
DB line angle	normal position and shape	malpositioned sharp rounded
DO embrasure	normal contour	closed open irregular point angle sharp-round
DG embrasure	normal contour	closed open irregular
ML embrasure	normal contour	closed open irregular
ML line angle	normal position and shape	malpositioned sharp rounded
DL embrasure	normal contour	closed open irregular
DL line angle	normal position and shape	malpositioned sharp rounded

F & L contours, cusps & grooves

Buccal contour, M-D	normal contour	convex concave flat irregular
Buccal contour, O-G	normal contour	convex concave flat irregular
Lingual contour, M-D	normal contour	convex concave flat irregular
Lingual contour, O-G	normal contour	convex concave flat irregular
MB cusp	correct height, position and shape	facial lingual mesial distal high low sharp rounded flat slopes concave slopes wrong slopes
DB cusp	correct height, position and shape	facial lingual mesial distal high low sharp rounded flat slopes concave slopes wrong slopes
ML cusp	correct height, position and shape	facial lingual mesial distal high low sharp rounded flat slopes concave slopes wrong slopes
DL cusp	correct height, position and shape	facial lingual mesial distal high low sharp rounded flat slopes concave slopes wrong slopes
Buccal groove	correct position, length, depth and slant	mesial distal long short shallow deep wrong slant
Distolingual groove	correct position, length, depth and slant	mesial distal long short shallow deep wrong slant

Occlusal anatomy & surface finish

Mesial marginal ridge	proper height, width and well-defined	too mesial too distal too high too low wrong slant too wide too narrow too sharp
Distal marginal ridge	proper height, width and well-defined	too mesial too distal too high too low wrong slant too wide too narrow too sharp
Triangular ridges	correct shape, slope and position	flat rounded sharp wrong shape not defined inclined too steeply incline not steep enough too mesial too distal
Oblique ridge	correct shape, slope and position	flat rounded sharp wrong shape not defined inclined too steeply incline not steep enough too mesial too distal
Primary grooves (MB&DL)	correct position and depth	not defined shallow deep wrong position
Secondary grooves	correct position and depth	not defined shallow deep wrong position
Fossae	correct position, shape and depth	shallow deep wide narrow
Surface finish	smooth, shiny, free of pits and scratches	dull pitted scratched irregular not blended

Total Score	!! 20	!! 8

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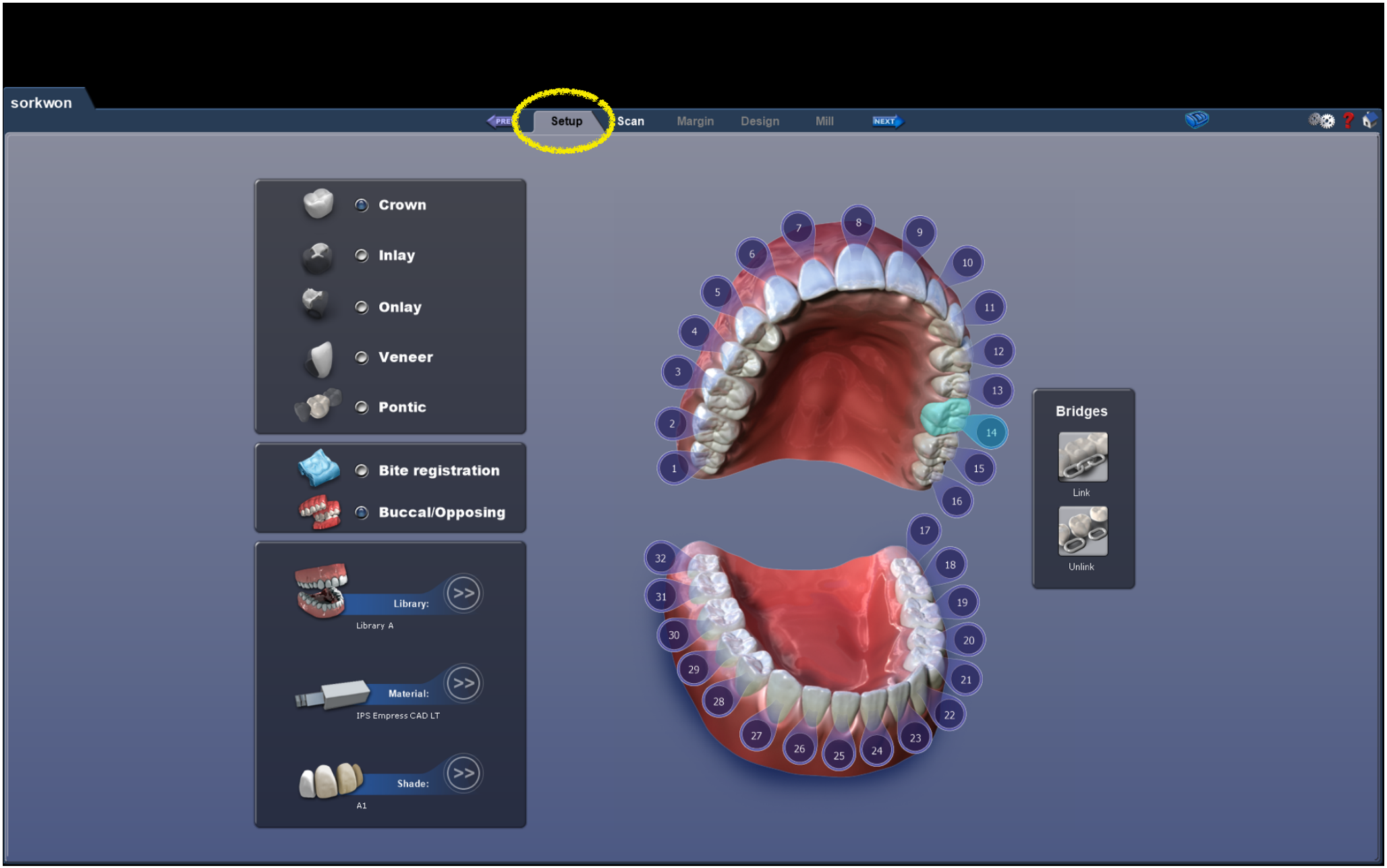
20Ö28x100=71.43

Digital Evaluation

- CEREC prepcheck, E4D Compare
- Objective evaluation
- Evaluation using scanned model compared to master model
- StudentsÕ feedback

Renne et al. E4D Compare Software: An Alternative to Faculty Grading in Dental Education JDE, 2013


sorkwon
Setup
Scan
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Veneer
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Bite registration
Buccal/Opposing
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Material:
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Shade:
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Bridges
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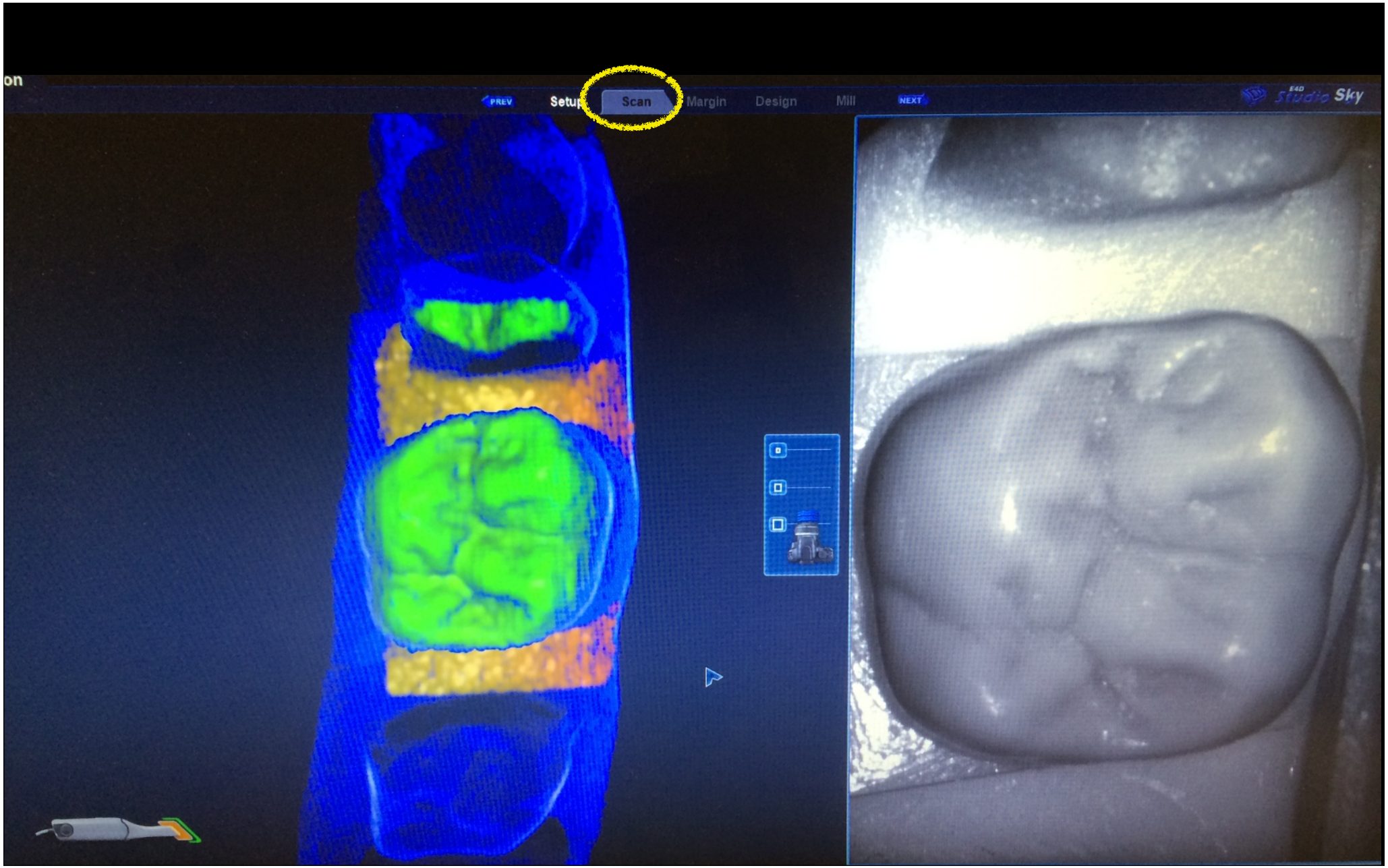
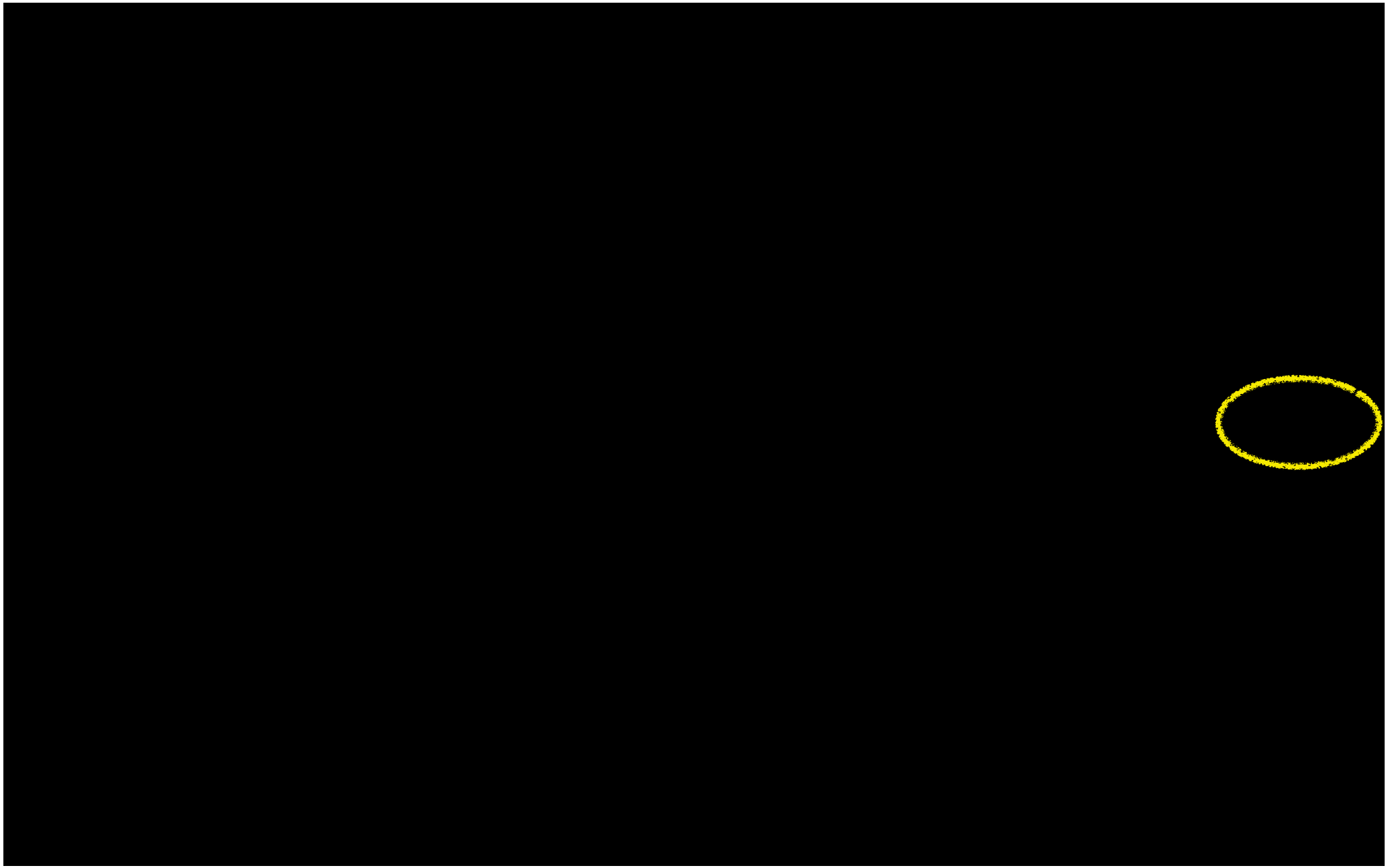
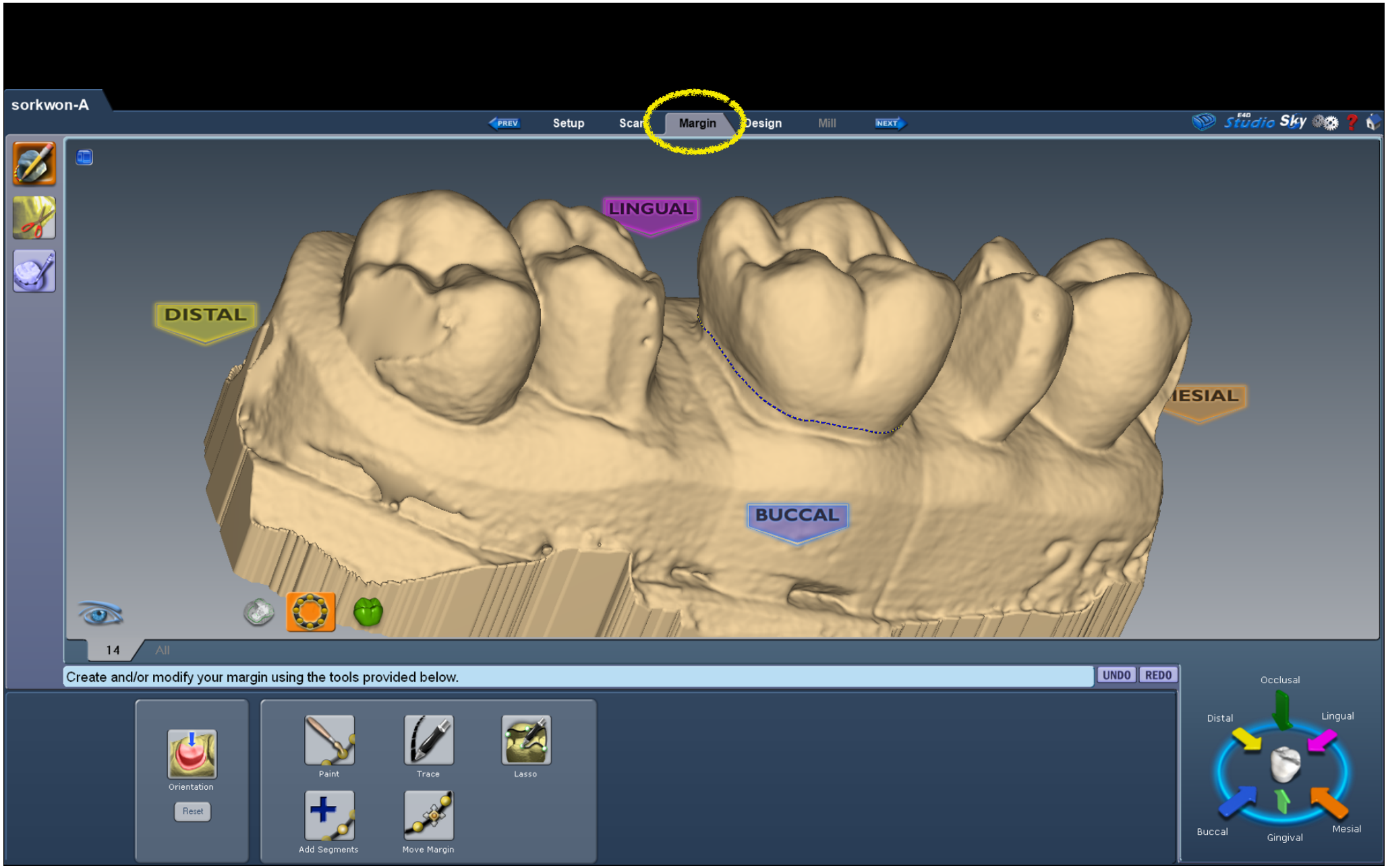

on
PREV
Setup
Scan
Margin
Design
Mill
NEXT
E4D Studio Sky




sorkwon-A
PREV
Setup
Scan
Margin
Design
Mill
NEXT
LINGUAL
DISTAL
BUCCAL
14
All
Create and/or modify your margin using the tools provided below.
UNDO
REDO
Orientation
Reset
Paint
Trace
Lasso
Add Segments
Move Margin
Occlusal
Distal
Lingual
Buccal
Gingival
Mesial