

AIDED: Artificial Intelligence for Dental Education

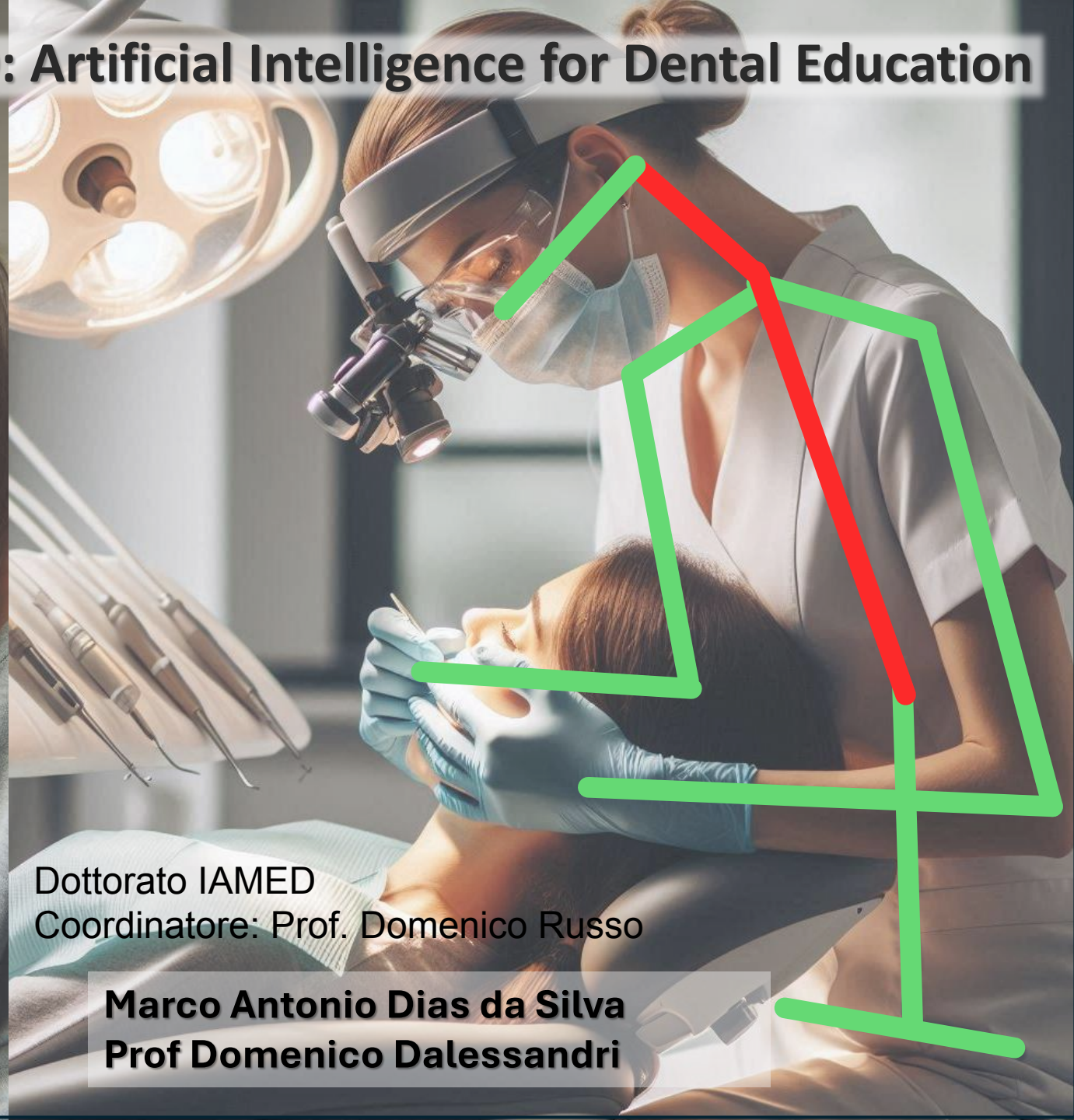


Dental Office

12m ago

Your appointment is **cancelled** -
dentist **neck pain**. Sorry!

Some images were created using Microsoft AI image generator



Dottorato IAMED

Coordinatore: Prof. Domenico Russo

Marco Antonio Dias da Silva
Prof Domenico Dalessandri



Introduction

U.S. News and World Report

33°: 100 best jobs

8°: health sector

Dentistry



Oral and Maxillofacial Surgeon

🏆 #1 in Best-Paying Jobs (tie)

From repairing cleft lips and palates to taking care of impacted teeth, oral and maxillofacial surgeons operate specifically on the mouth, jaws, teeth, gums, neck and head. [Read More »](#)

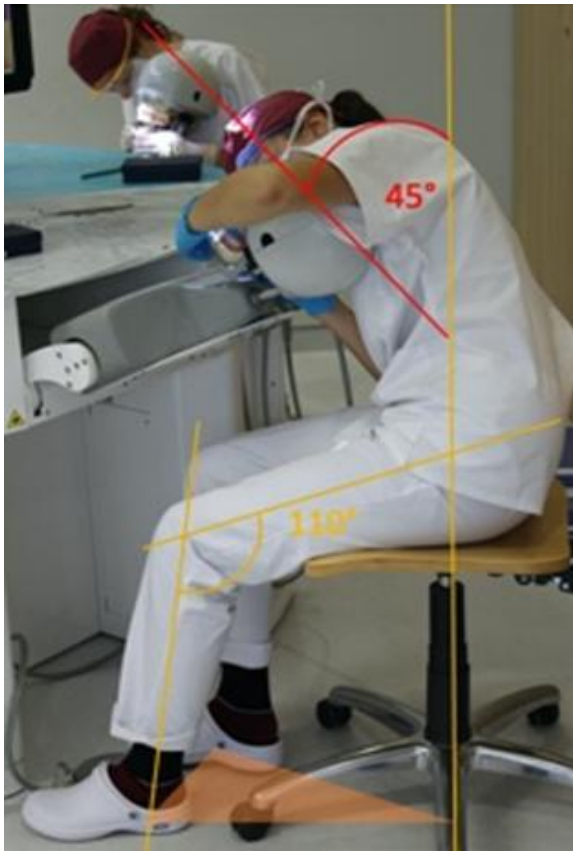
Projected Jobs
200

Median Salary
\$239,200

Education Needed
Doctorate

<https://money.usnews.com/careers/best-jobs/rankings/best-paying-jobs>

Ergonomics and Dentistry



Viratelle et al., 2022 / DOI: 10.1111/eje.12843

Students and Women

Viratelle et al., 2023



Viratelle et al., 2022 / <https://www.dentalis.com.br/blog/933-2/>

Top three health risks:

- 1. Exposure to disease and infections: 95
- 2. Exposure to radiation: 85
- 3. Time spent sitting: 82

<https://www.businessinsider.com/most-unhealthy-jobs-in-america-2017-4#1-dental-hygienists-47>

Pain	Adult population	Dentists
Neck	14%	67 - 85%
Back	27%	65 - 93%

https://www.fdiworldddental.org/sites/default/files/2021-04/FDI_HSDW_ergonomics_and_posture_guidelines_eng_2021.pdf



Dentists and dental students in Pain.

\$200Bi

Economic Impact

64%

Minimum Affected

93%

Experience Pain



Careers Cut Short. Patient Care at Risk.



Early Pain

Starts during training



Chronic Issues

Reduced work ability



Early Retirement

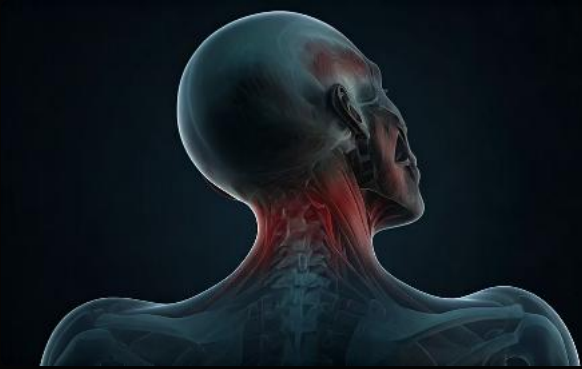
Skilled professionals lost



Care Shortage

Threatens dental access

The Bend. The Strain. The Core Problem.



Neck Flexion

Forward bending for oral cavity view



Lower Back Strain



Awkward Positioning

Blind Spots in Assessment. Missing the Full Picture.

Subjective Observation

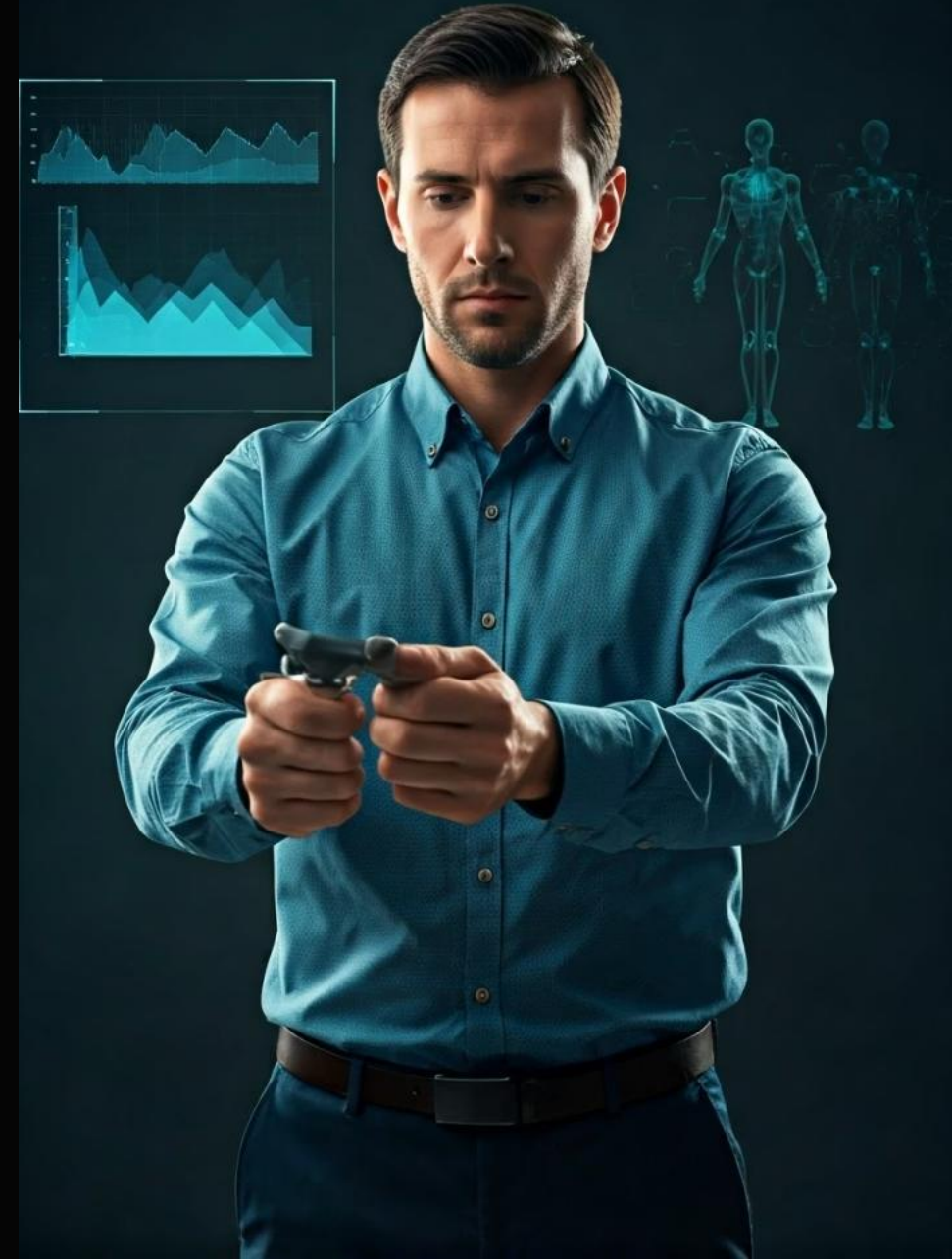
Varies between individuals

Static Measurement

Misses dynamic movements

Underestimated Risk

Fails to capture true danger



AI Sees What Eyes Can't. Precision Ergonomics.



1

Real-time Tracking

Continuous posture monitoring

2

Objective Analysis

No human bias

3

Instant Feedback

Green to red visual indicators

4

3D Capabilities

Complete movement capture



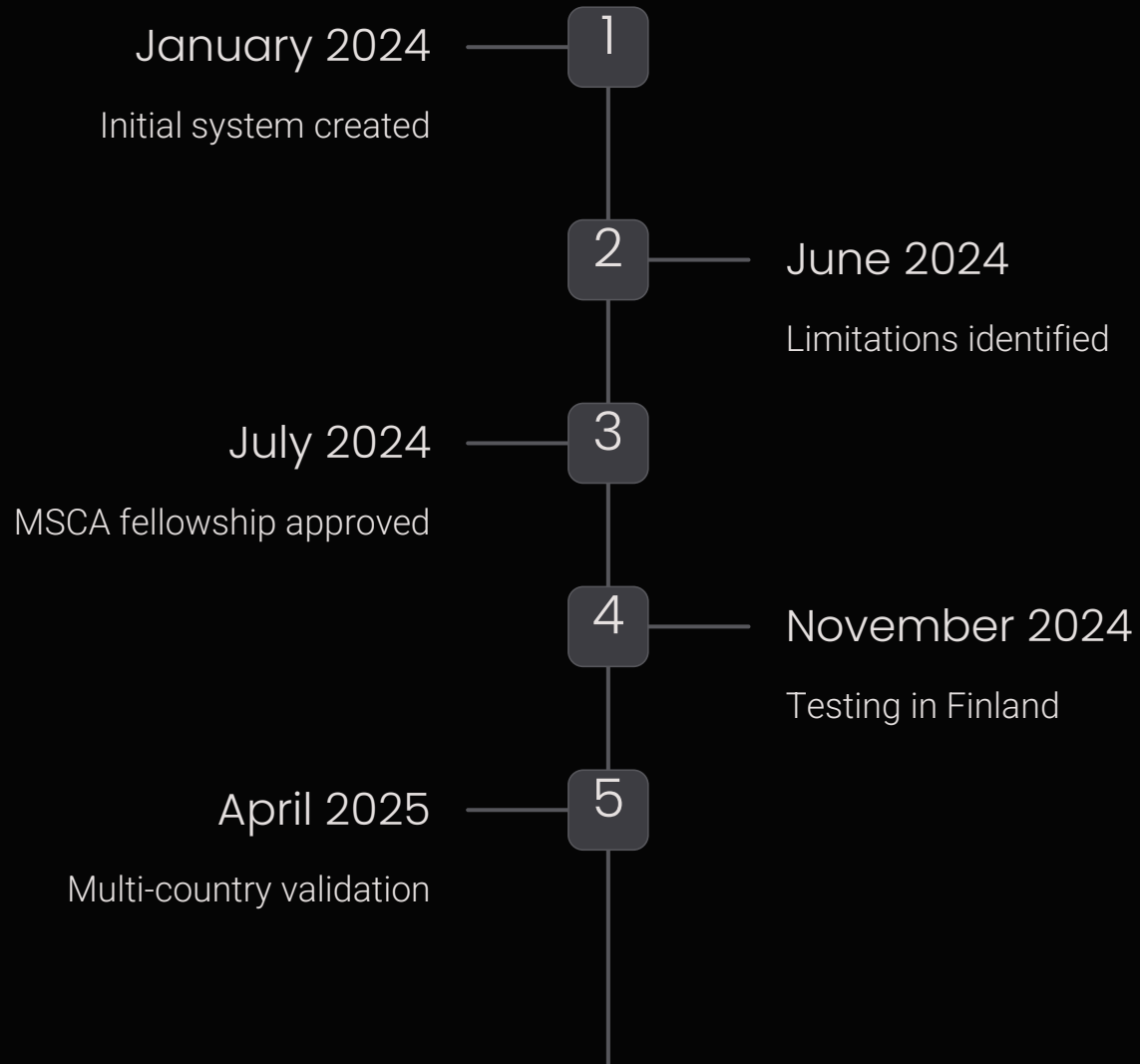
Develop an automatic AI powered and non-sensor computer vision system capable of detecting dental working positioning real-time to assist dental professionals and students during practical sessions.

Aim

Methodology

Semester	1	2	3	4	5	6
Settlement						
System Video capturing						
Ethical clearance						
AI programming						
Working protocol						
AI Training						
Participants selection and Video recordings						
Data collection and analysis						
Literature study and review						
public engagement and dissemination activities						
Oral communications in international conferences, seminars and symposium						
Writing and submission of research results to peer-reviewed journals						

From Idea to Insight

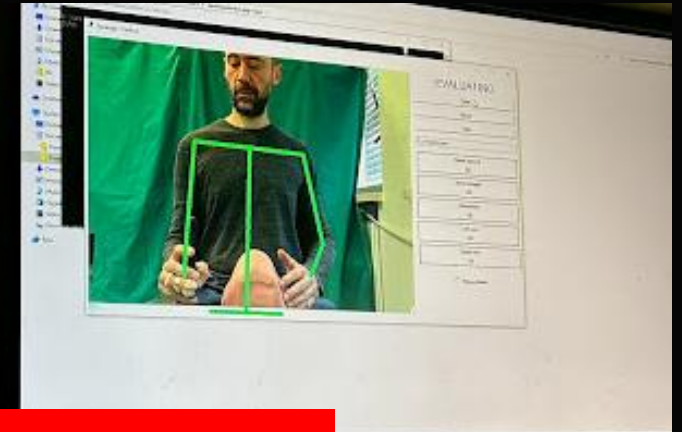


From Idea to Insight

January 2024

1

Initial system created



**Imprecise
Could not see 3D movements
properly
joint detection was not good**

July

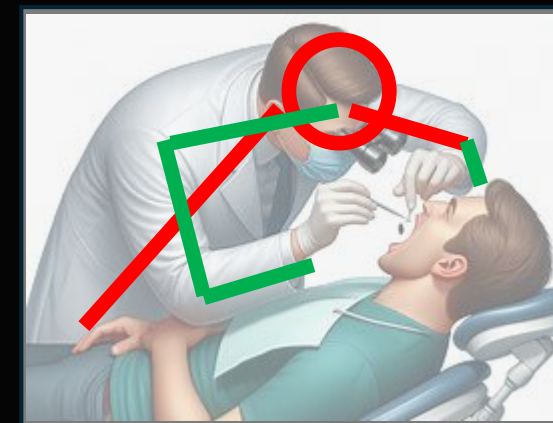
MSCA fellowship at

Testing in Finland

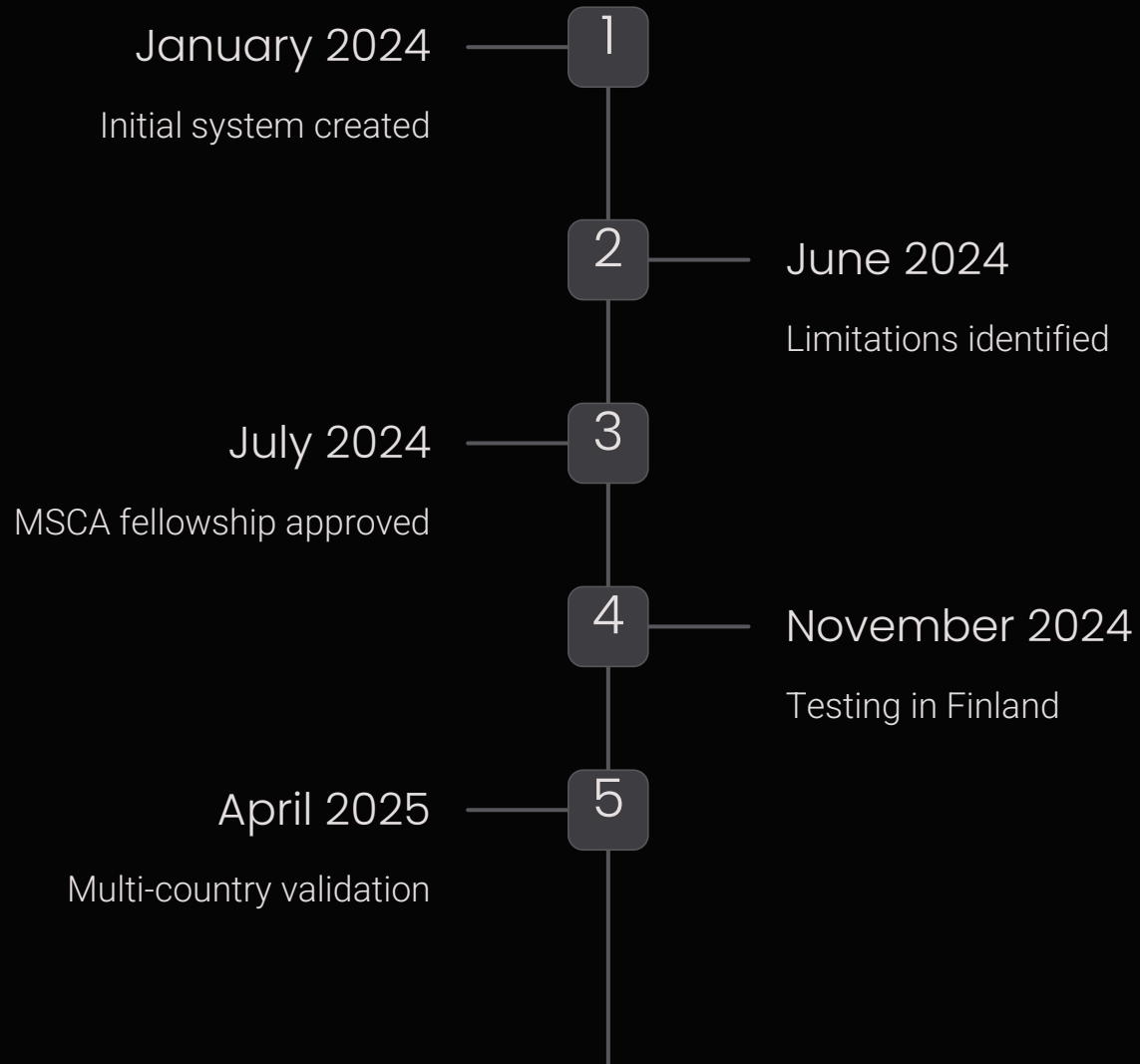
April 2025

5

Multi-country validation



From Idea to Insight



From Idea to Insight



UNIVERSITÀ
DEGLI STUDI
DI BRESCIA

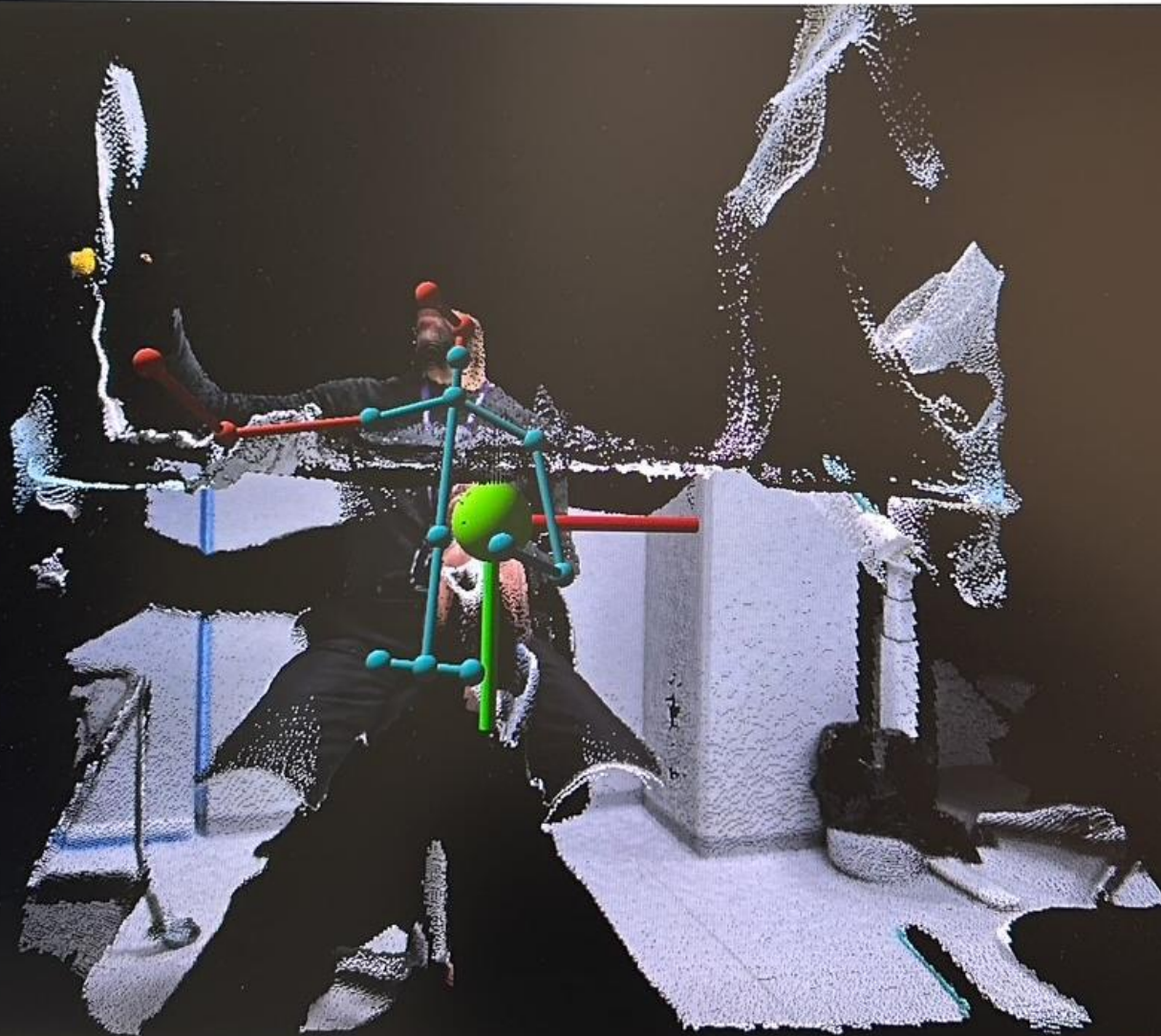


UNIVERSITY
OF OULU



Don't bend your neck too much.
Don't raise your elbow too high.
Don't overextend your elbow.

Camera 39.3 fw 0.3 side
Camera height 1646mm
Manequen height 873mm
(m) View: Depth
(y) Capturing: Stopped
(k) PointCloud = On
(c) PointCloudColors = On
(f) Floor = Off
(s) Stabilize = Off
(a) Alarms = On
(w) ExpColorPuppet = On



3°C
Pioggia e neve

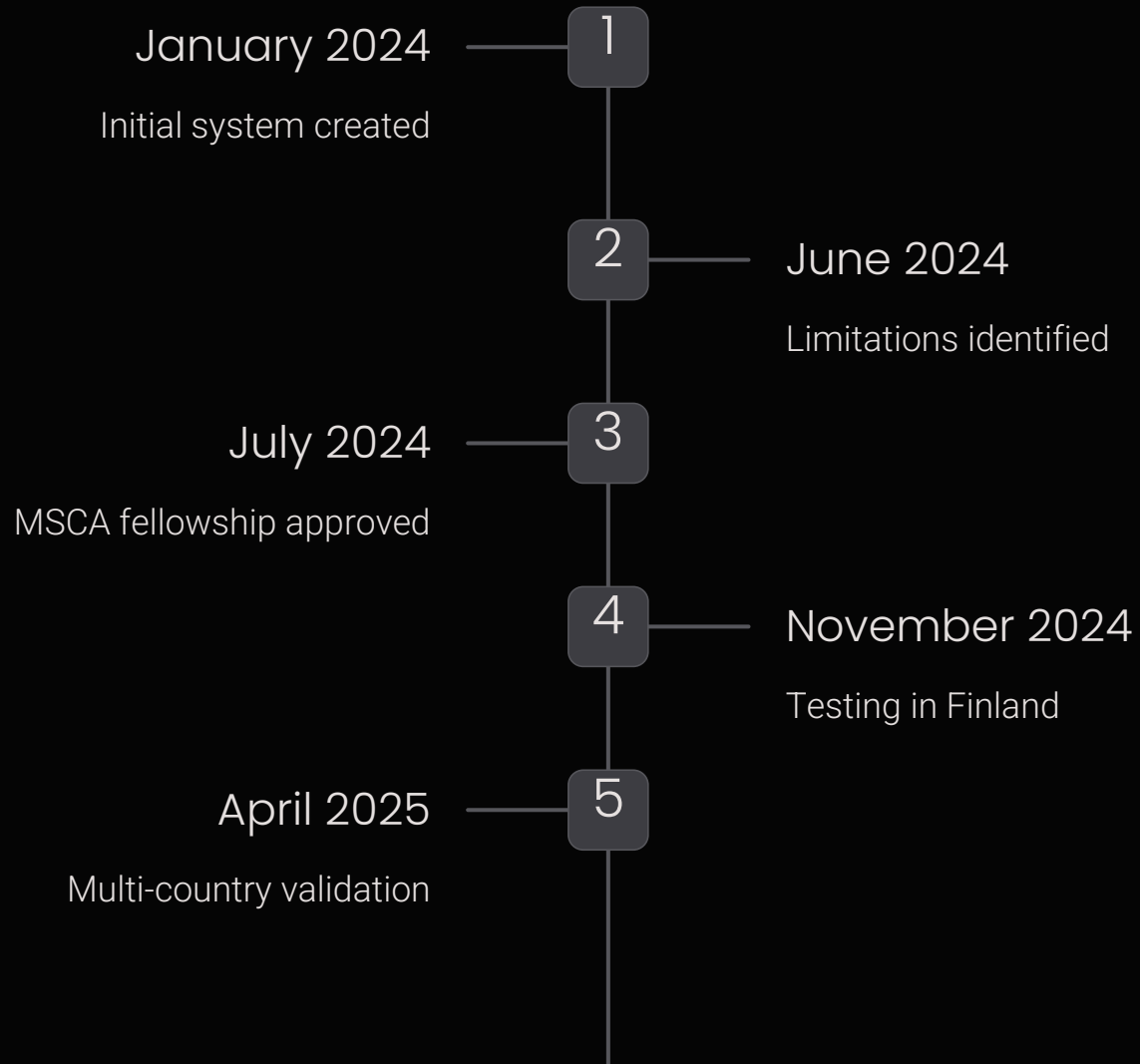
Search

Version 1.1.2 - Serial CL8FC3100BA - Temp 33.70 C

LEASING 9/2022
service@poula.fi
tel) 040 342 44 00
telephone/puhelin 482124

ENG 6:18 PM
3/30/2025

From Idea to Insight



Università degli Studi di Brescia

46,754 followers

3w • 🌐

🎓🎓 Ieri, presso il Salone Apollo del Rettorato, si è tenuta l'edizione 2025 del contest "My 3-minute PhD Thesis". L'evento ha coinvolto sei dottorandi ...more

Show translation



- 5 Teachers
 - Experienced dental educators
- 5 Working Sessions
 - 20 minutes each, structured protocol
- Deliberate Posture Variation
 - Correct vs. incorrect positioning
- Comprehensive Analysis
 - Personalized reports and feedback

Experienced dental educators

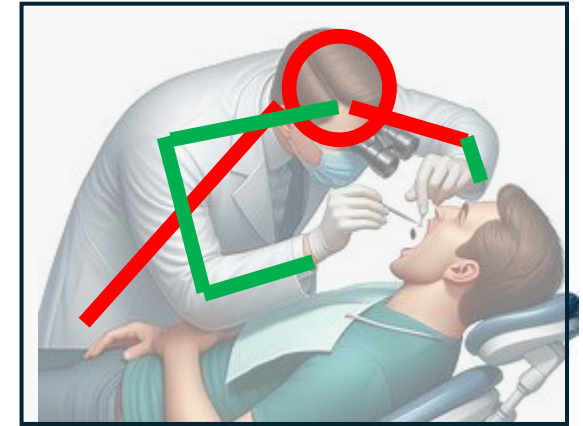
20 minutes each, structured protocol

Correct vs. incorrect positioning

Personalized reports and feedback

Limitations

- obstruction of the joints
- number of positions
- changes in position during movement
- variations, dimensions of the operator
- working time / work time
- hand position
- camera positioning
- costs...





Idea, MVP, Tests!

Correct angulation knowledge



Improved system

Practical experience integration



Literature, IT, Physiotherapist and dental nurse Input

Correct angulation AI instructed.



Dental Teachers / International Collaboration / testing

Practical experience integration / Spain, UAE, Italy, Finland



Evaluation, writing and dissemination

Tests, Public engagement, Scientific dissemination

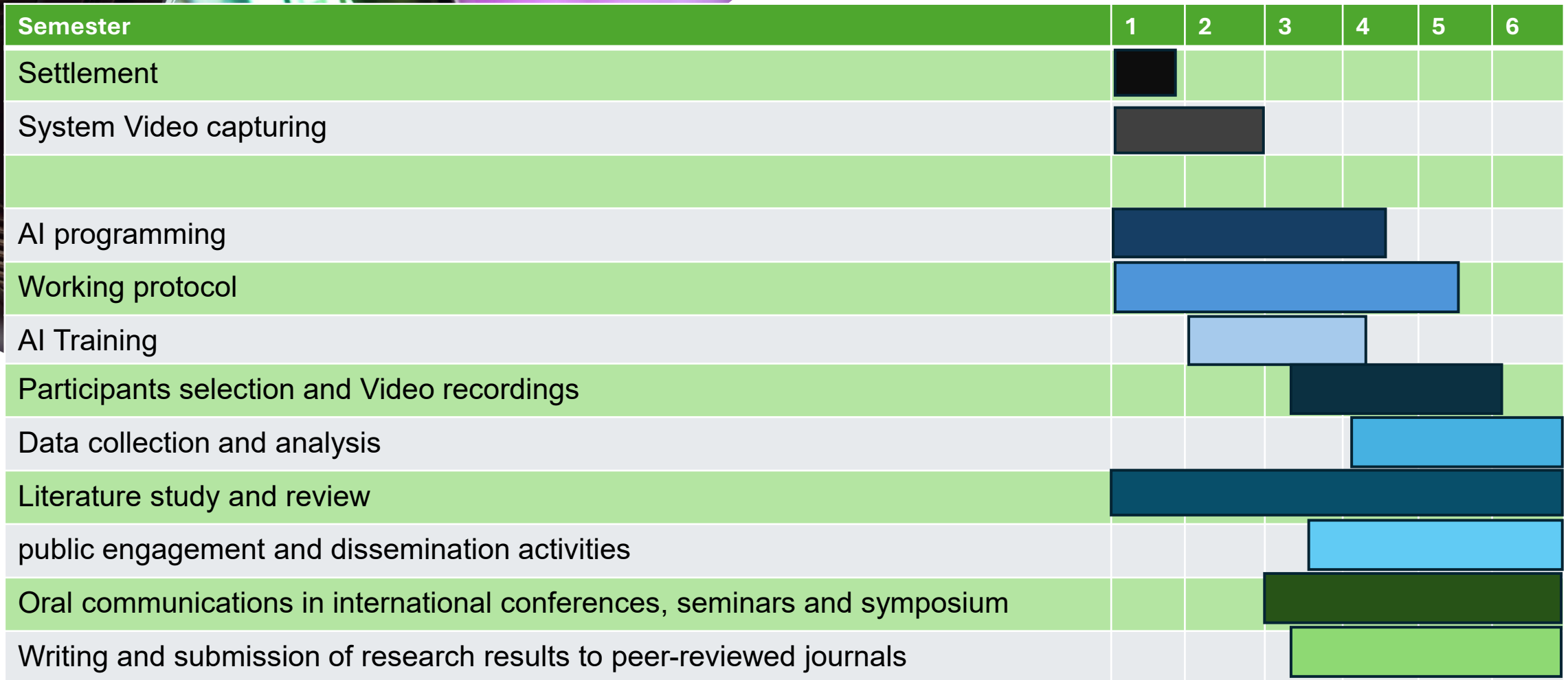


Conclusion

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Writing and submission of research results to peer-reviewed journals						

Ongoing Methodology



AI see Your Posture. You Own Your Health.



Real-time feedback empowers immediate correction

Comprehensive reports identify patterns

Data-driven insights for lasting change

