enatom

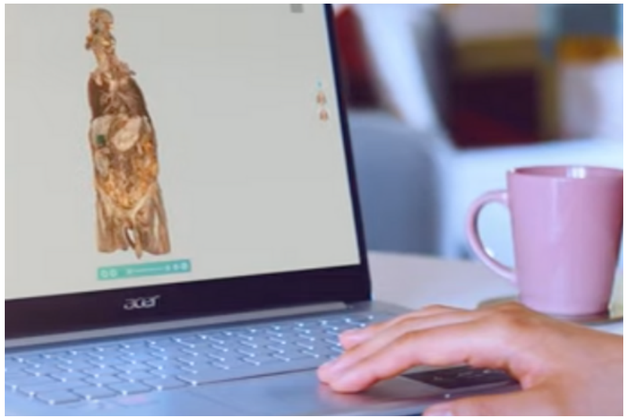
Introduction TU Delft - Enatom
OCTOBER 2023

explicit content

umcg

INTRODUCTION

THE PROBLEM: Whilst the need for anatomical knowledge increases, the gap between theory and practice in anatomy education is too big due to

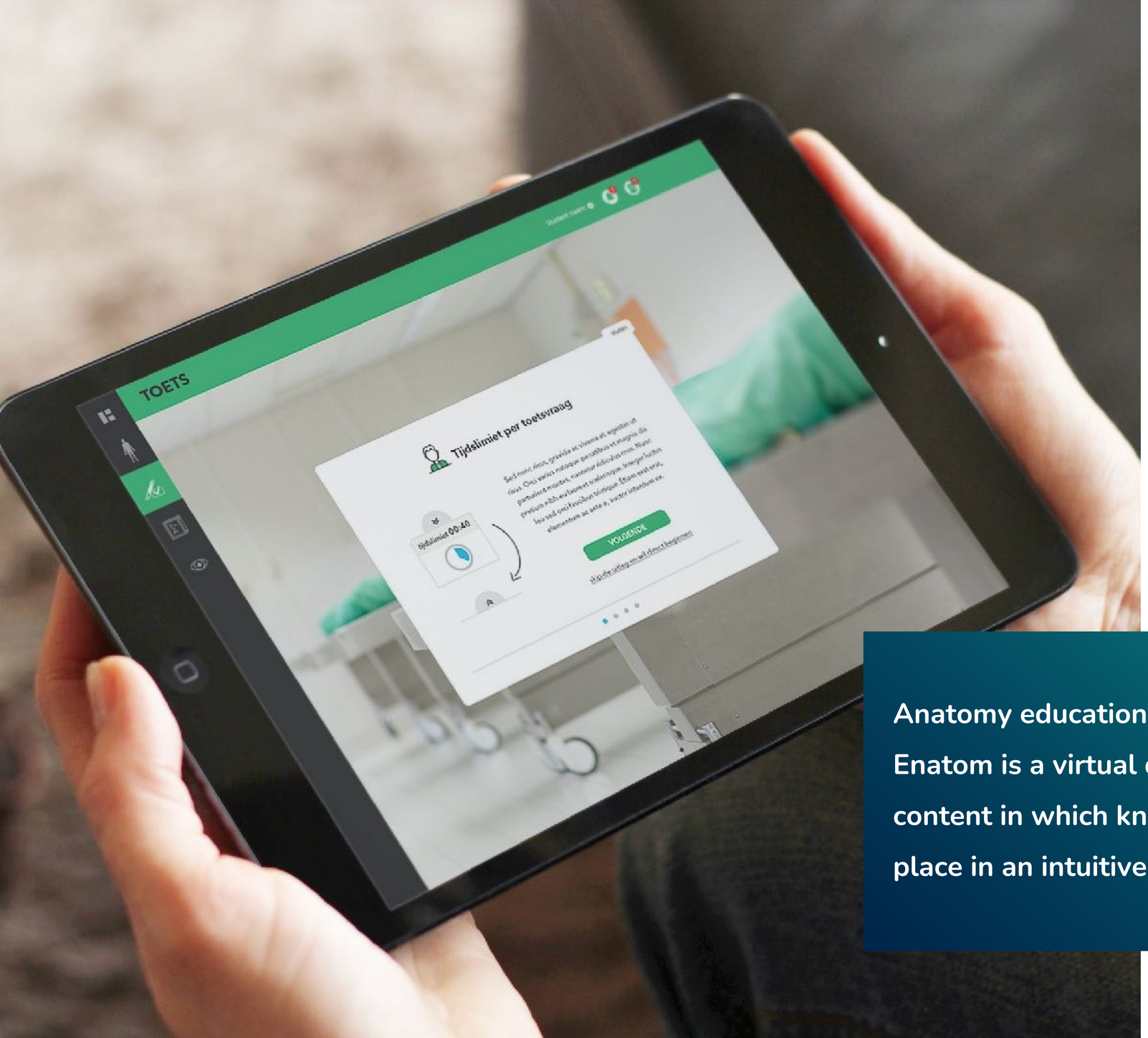


1. Limited/no access to dissection rooms, because of:

- Cultural beliefs (e.g. religion does not allow dissection)
- Low resource settings
- Deliberate choice
  - Cost effectiveness
  - New institutes
  - Limiting use of biocides

2. The changing educational landscape in biomedical studies:

- Students are expected to do more self study when it comes to basic/exact knowledge like anatomy.
- Contact hours are decreasing
- Exponential growth of available anatomical information - how to extract the right knowledge?
- New studies - where students enroll with different study/job backgrounds (lack of basic level of anatomy)



OUR SOLUTION

A photorealistic Digital twin

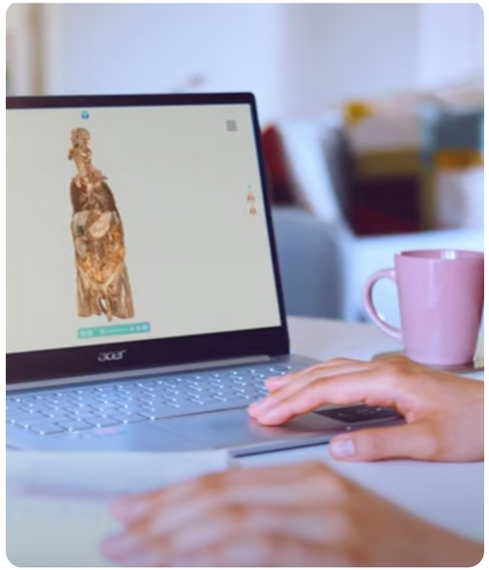
Anatomy education for tomorrow’s healthcare professional. Enatom is a virtual dissection room with photorealistic content in which knowledge transfer and testing can take place in an intuitive way at any place and any time.

Torso 6

A virtual dissection room built on (digital) craftmanship

Photo realistic and diverse content

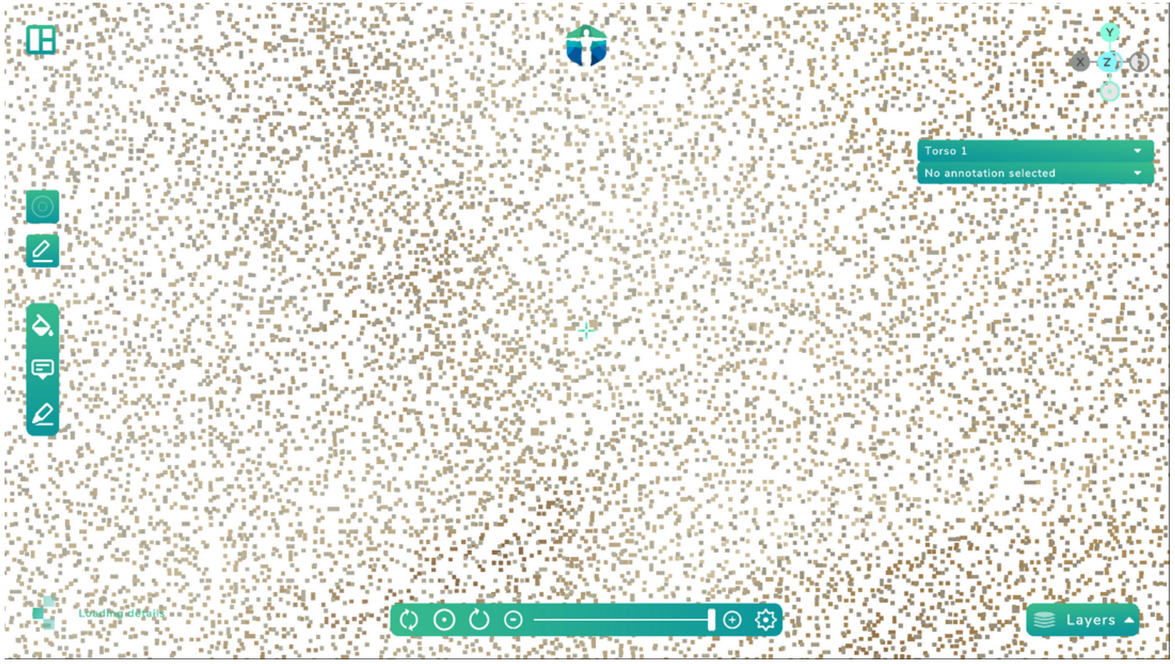
Web application - Anatomical Atlas



Assesment

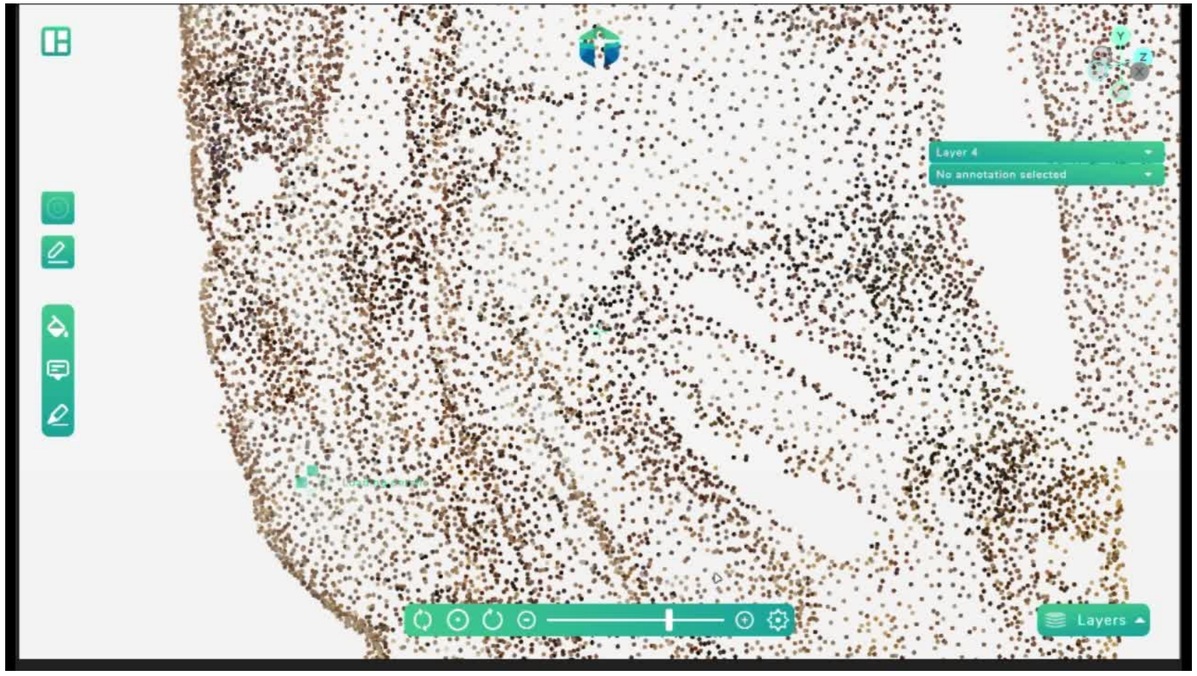
Ready for future use

Challenges



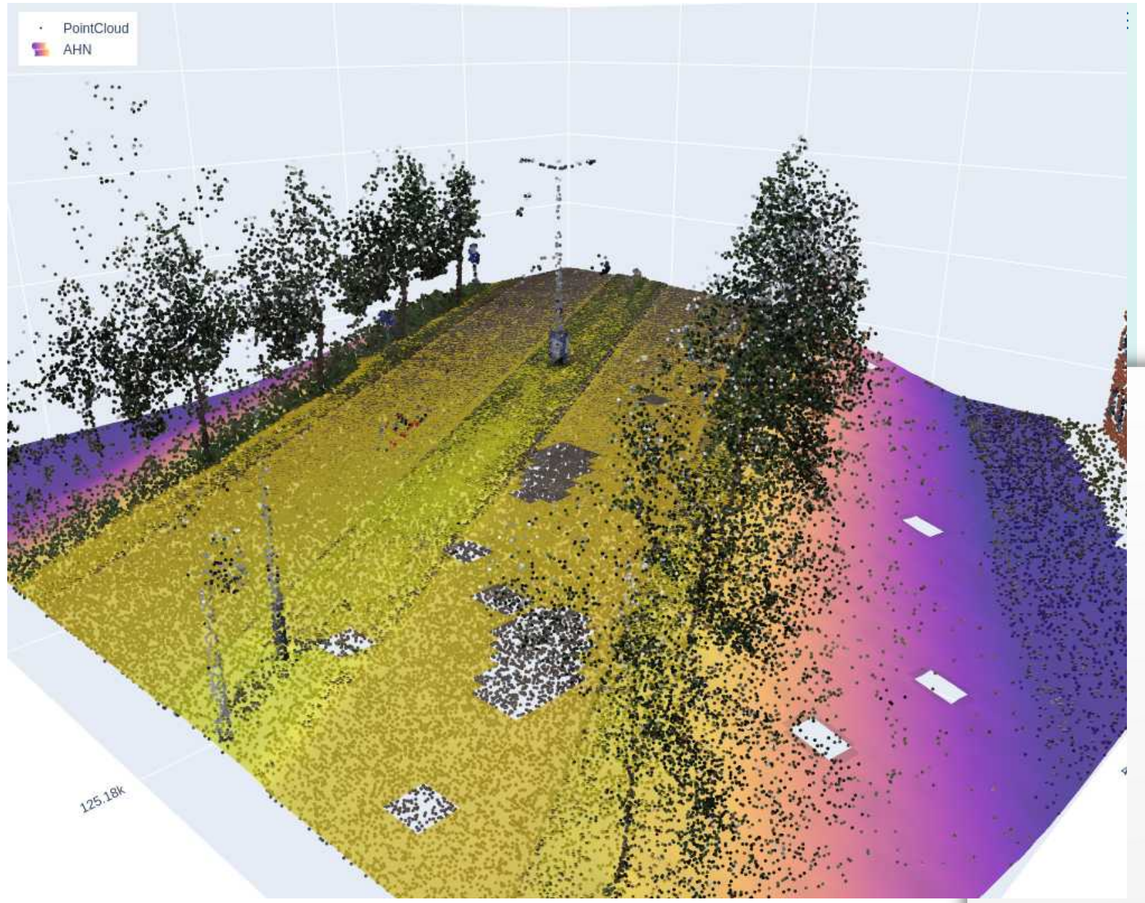
- continuous level of detail delivery
- Future proof? (nanotech/nanite/NERF)

- Empty space
  - dynamic point size (splatting, interpolation etc.)
  - point SDF(signed distance field)
  - keep the data as 'real' as possible! (Clinical precision)
- Faster streaming
- Smarter points/nodes selection (see video)
  - Download/stream order
  - Frustrum culling
- Memory handling (MAC!) gpu/cpu
  - platform agnostic



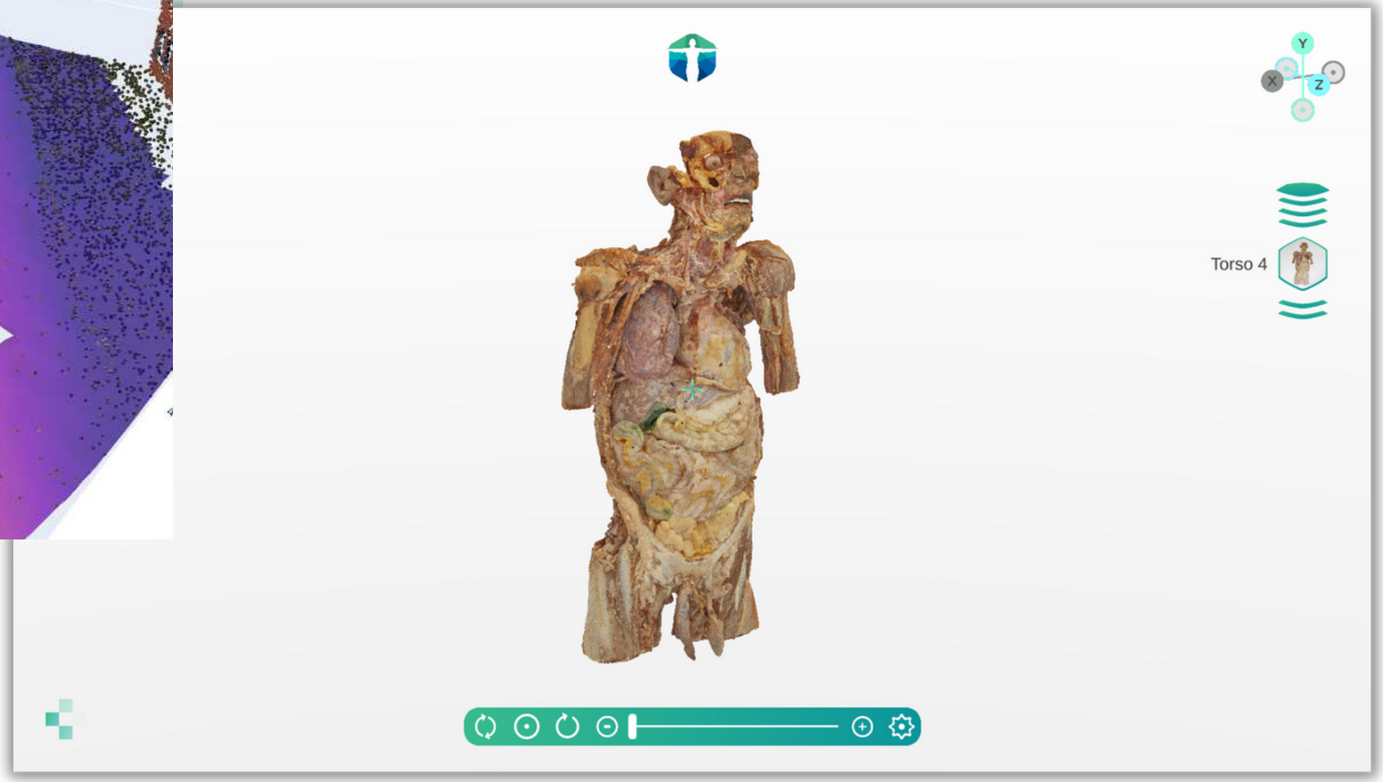
Geomatics?

It's the same! but different



- Showing AS IS data
- Importance of details

- Explorative vs knowledge building
- Direct use vs clinical and photoreal details

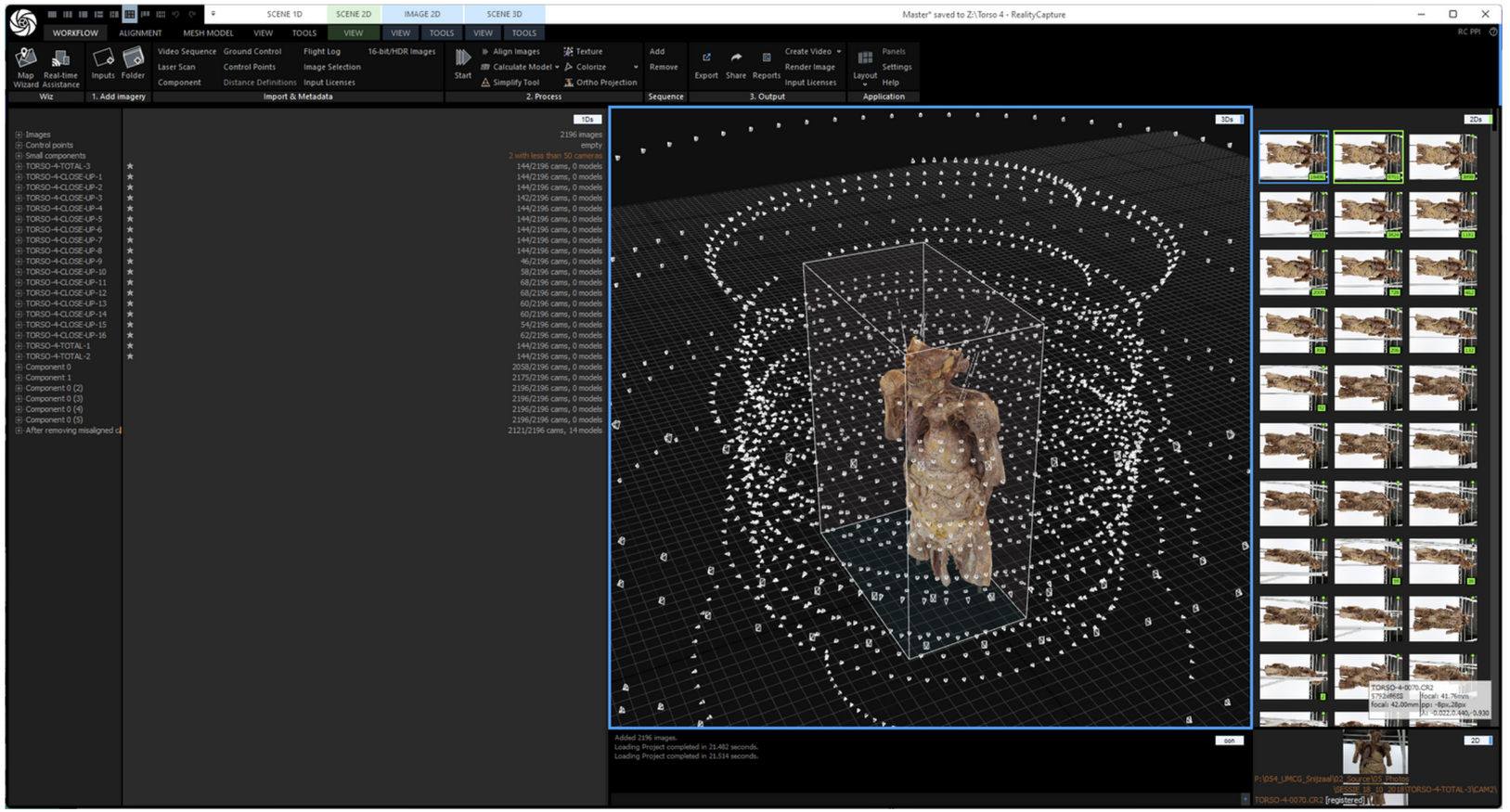


- Areas of interest
- Data usage

Our process

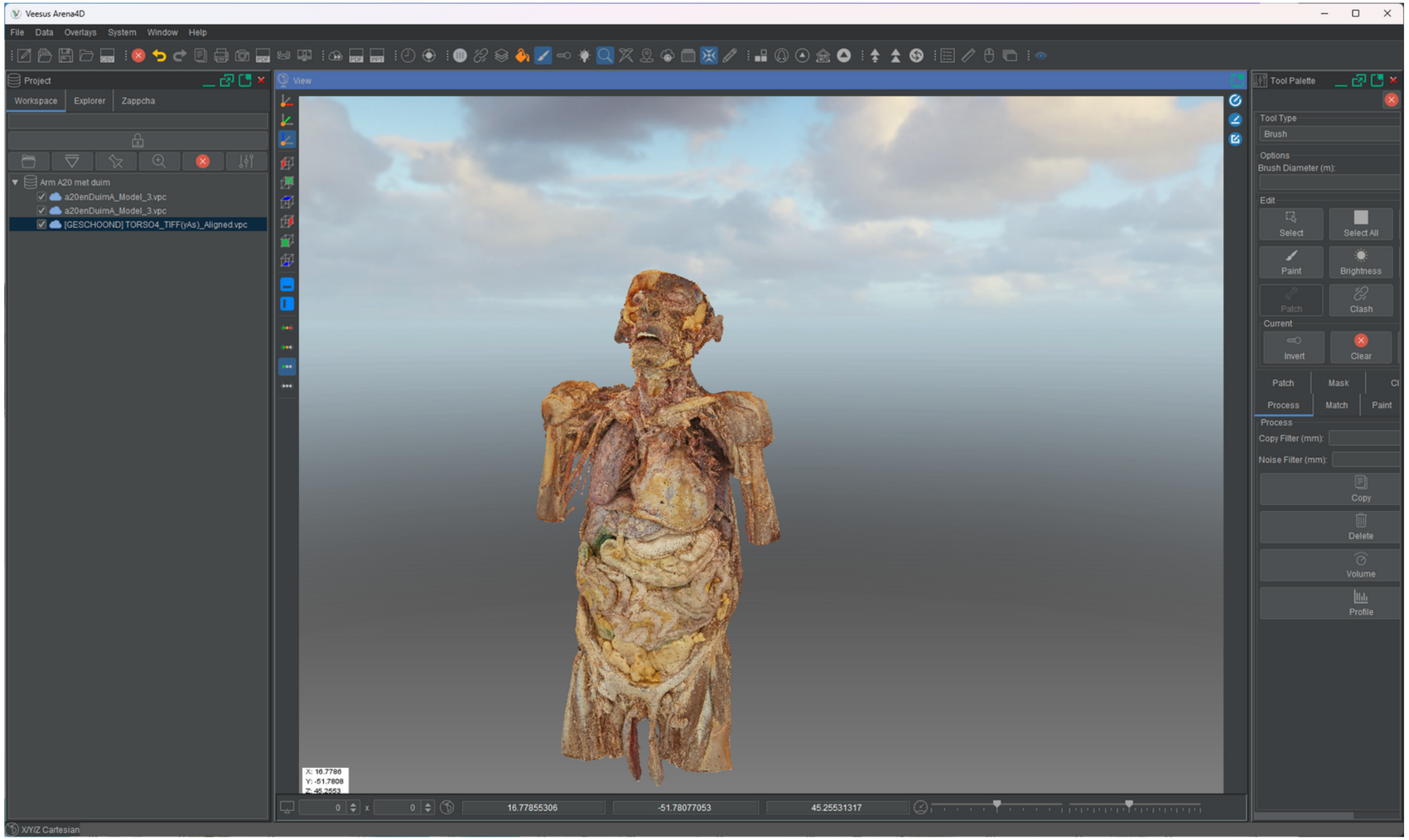
Preparing and photos

Our process



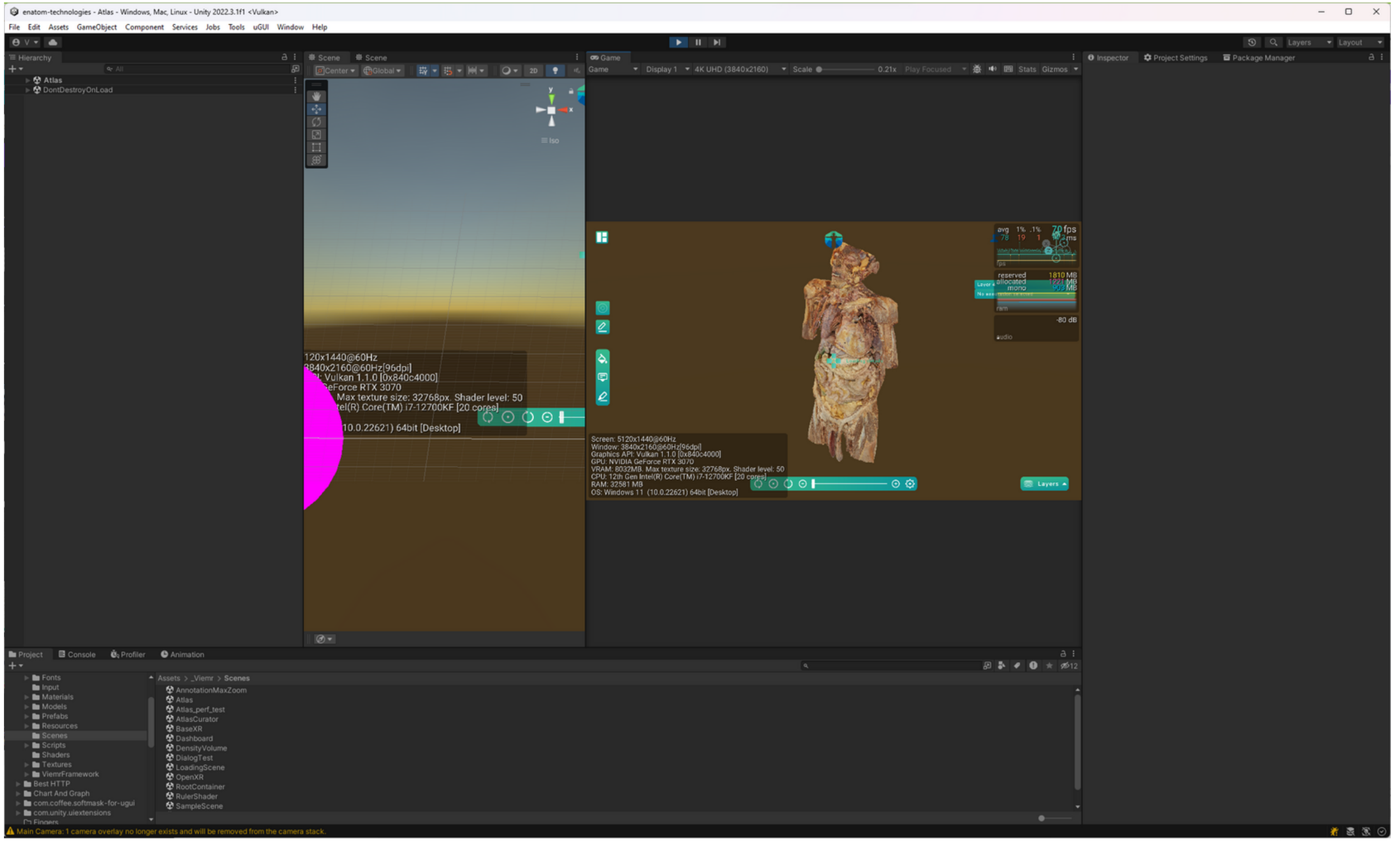
Reality capture

Our process



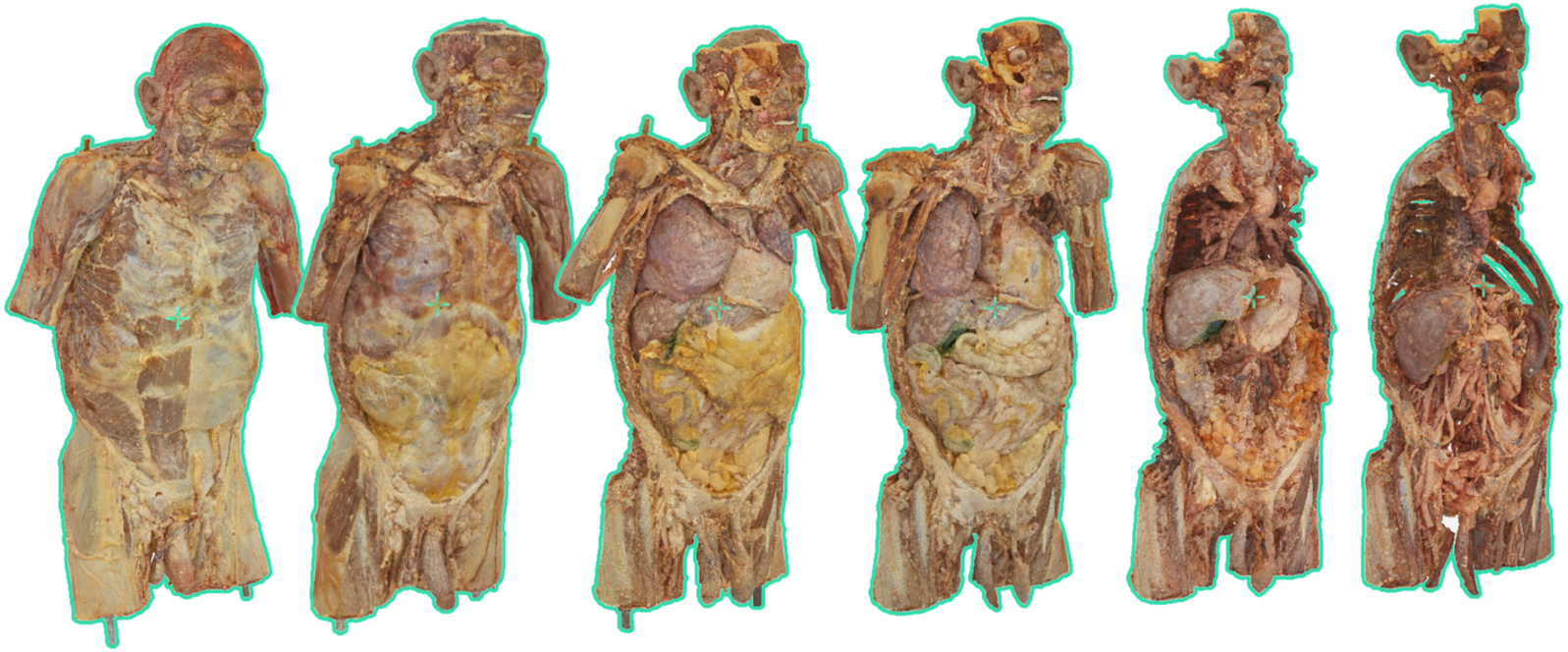
Arena 4D annotation

Our process



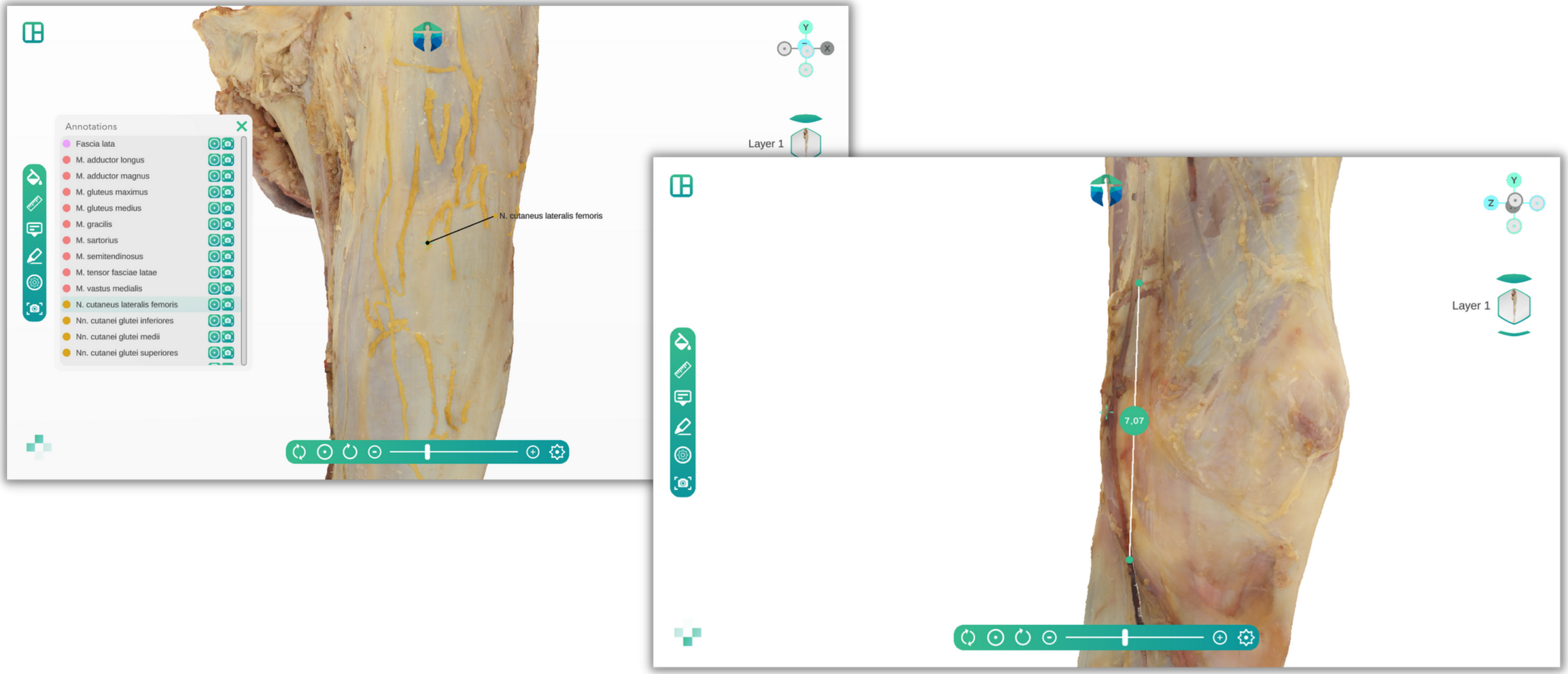
Unity engine

SPECIMEN - 6 LAYERS OF CONTENT

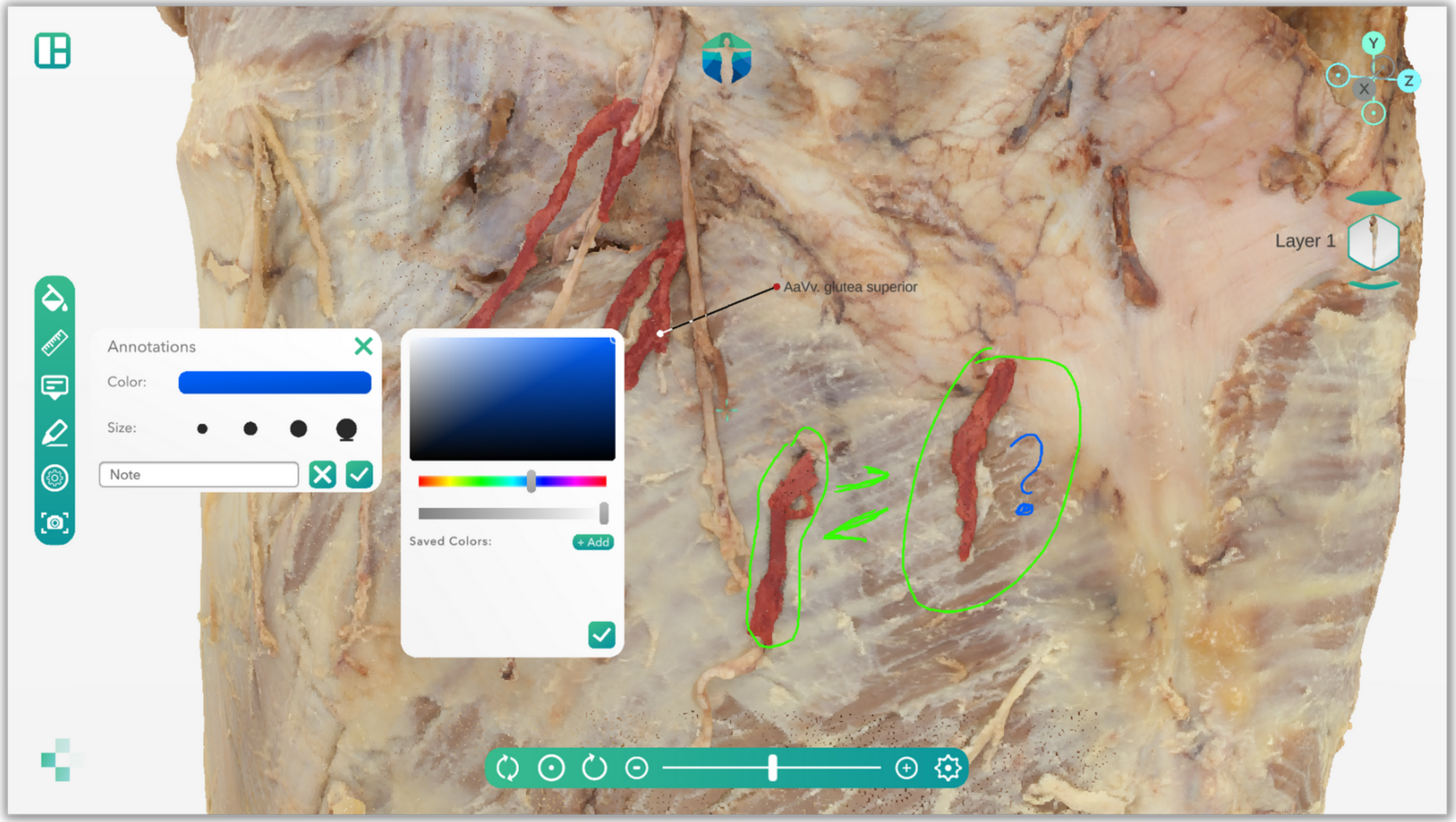


- 200 million plus points per specimen
- Using Potree v.1.7 format (octree nodes)
- Encypting and decrypting binary files while streaming
- Flattening the potree structure for speed
- Using Intensity as 'classification' system
- Changing colour for selecting structures/annotations

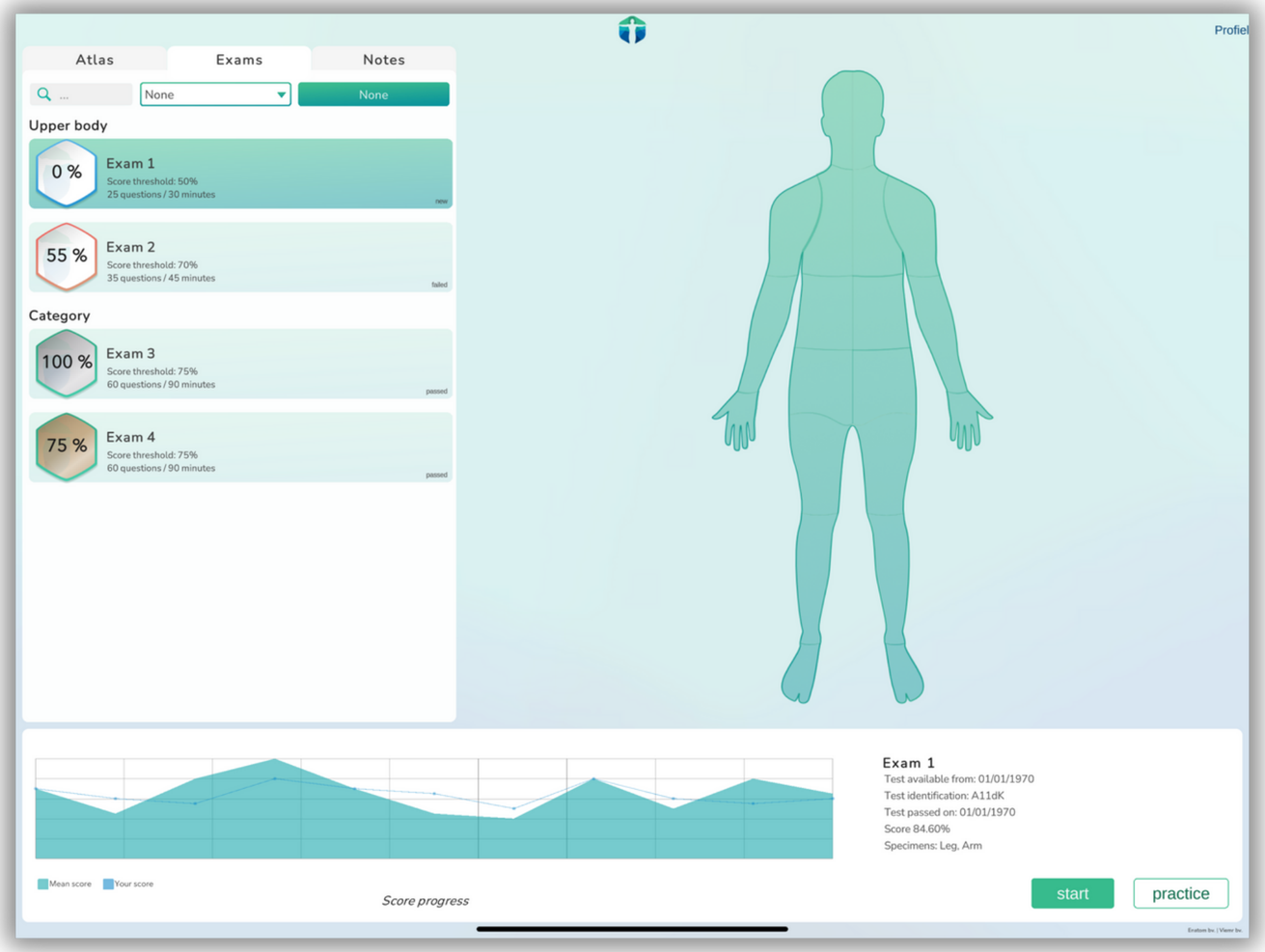
ANNOTATIONS & MEASUREMENTS



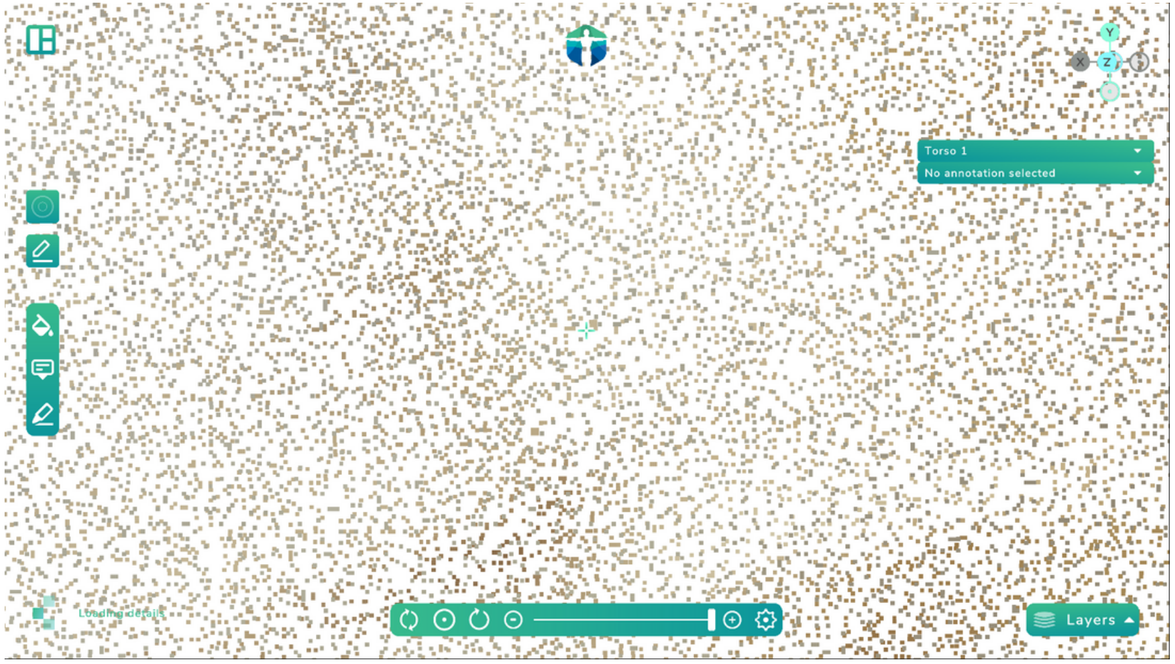
PERSONALIZE WITH NOTES



TESTING ANATOMY KNOWLEDGE



Challenges



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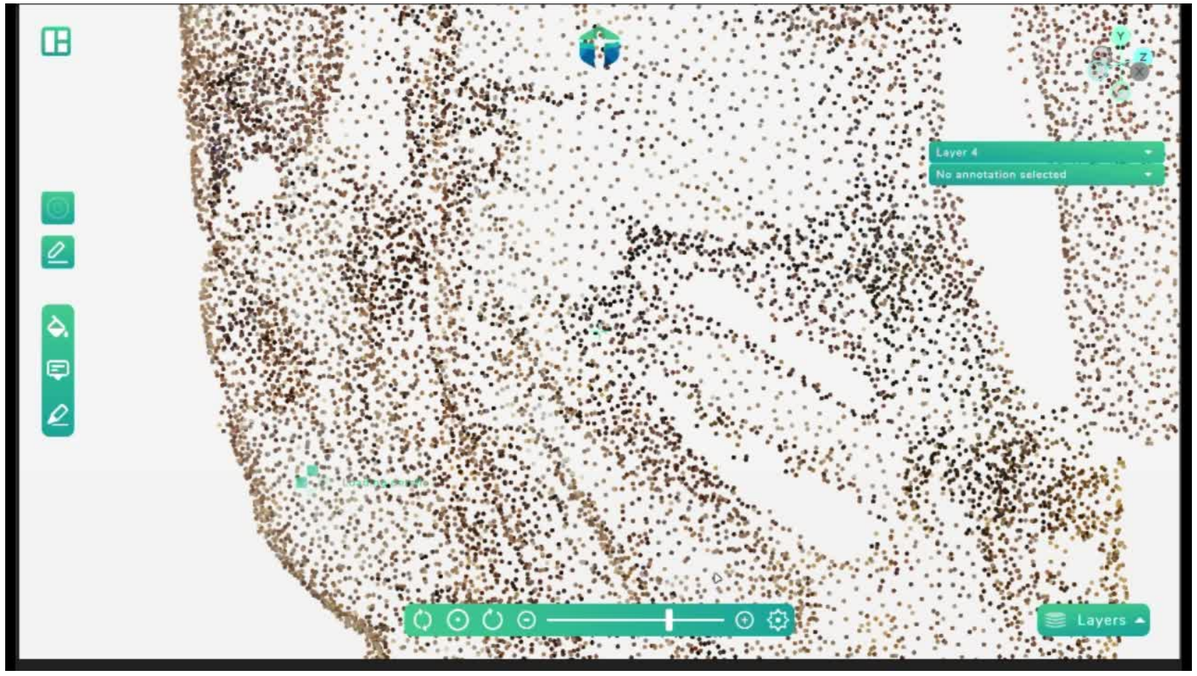

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