# enatom

# Introduction TU Delft - Enatom OCTOBER 2023









### 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



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



#### 2. The changing educational landscape in biomedical studies:

• Exponential growth of available anatomical information - how to extract

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.

TOET

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## OUR SOLUTION

# A photorealistic Digital twin





#### 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
- Download/stream order
- Frustrum culling
- Memory handling (MAC!) gpu/cpu

<sup>•</sup> platform agnostic



- Smarter points/nodes selection (see video)

#### Geomatics?

#### It's the same! but different

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- Showing AS IS data
- Importance of details

- Areas of interest
- Data usage

#### data Jetails

• Explorative vs knowledge building

• Direct use vs clinical and photoreal details





Preparing and photos

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**Reality capture** 



Arena 4D annotation



**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



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