



# Advancing Medical Education through Digital Technology: Empowering Students with 3D Model.

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# Importance of digitisation and learning how to create 3d models, and learning with 3D models



## Digitisation

- Accessibility
- Efficiency



## Create 3D

- Learning and development
- Problem-Solving skills



## Learn from 3D

- Enhanced understanding
- Apply, imply and learn

# Day 1

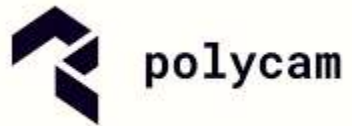


## Tools/Applications

## Process

## Advantages

## Constraints/ Challenges



Materials : iphone,  
Turntable,



- Selected Plastinated Human Brain from the Anatomy teaching collection.
- Obtained nearly 100 images in total from every possible angles and surfaces.
- Used elevated support for small models

- Mobile access
- Easy, user-friendly interface
- Accuracy , Texture and details, resolution
- Easy export in various file formats
- 7 Day Free Trial / £7 per month

- Lighting
- Avoiding object interference
- Avoiding reflection
- Larger objects
- Requires phone with good camera

# Day 2


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Tools/Applications	Process	Advantages	Constraints/ Challenges
 <p>Blender (Post-processing)</p>	<ul style="list-style-type: none"><li>• Comprehensive view of the model</li><li>• Clean up the mesh</li><li>• Surface smoothing</li><li>• Fixing holes and gaps</li><li>• Refine the model</li><li>• Export</li></ul>	<ul style="list-style-type: none"><li>• Corrects any imperfections</li><li>• Used to adjust the transparency and color of the models obtained from 3D slicer</li><li>• Free , Cost-effective</li><li>• Precision and detail – refinement</li></ul>	<ul style="list-style-type: none"><li>• Trial and error</li><li>• Need guidance</li><li>• Export formats and the resolution.</li><li>• Memory usage – sometimes slowing the system.</li><li>• Low quality scan hard to clean up and correct the imperfections.</li></ul>

# Day 3

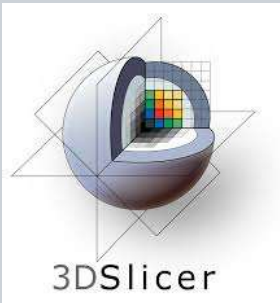


## Tools/Applications

## Process

## Advantages

## Constraints/ Challenges



3DSlicer

3D Slicer

- Used CT / MRI Medical scans – DICOM Files : Multimodal imaging
- Import the data set
- Region of Interest/Structure : Lungs, Heart, Kidney , Abdominal aorta
- 3D segmentation/ reconstruction process
- Segment editor – Grow from seeds
- Adjust the Threshold/Preset

- Learn and differentiate the anatomical structures in the different densities.
- Normal and Pathological differentiation (Tumors)
- Obtain 3D Print model from segmentation
- Free, Cost-effective

- Trial and error
- Need guidance
- Leaks from seed placement
- Missing any steps produces a much worse image at the end
- Memory usage – sometimes slowing the system.



# Day 4 & 5 : Integration


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Tools/Applications	Process	Advantages	Constraints/ Challenges
<p>Sketch Fab</p>  <p><a href="#">msdlt – Sketchfab</a></p>	<ul style="list-style-type: none"><li>• Exported the 3d model</li><li>• Annotation</li></ul>	<ul style="list-style-type: none"><li>• Best tool to display the 3D model</li><li>• Supports multiple formats</li><li>• Embeds nicely within Canvas</li><li>• Can import directly from PolyCam (unlike Cabinet)</li></ul>	<ul style="list-style-type: none"><li>• Minimal model blurring , reduces image clarity</li></ul>

# Key takeaway

- Fostering innovation for students
- Educational resources
- Collaborative projects
- Reproducible
- Pre-surgical planning and simulation
- Plug in tools : Machine learning integration to develop AI –based models for image analysis

Thank you