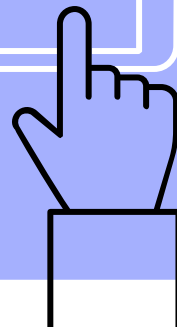
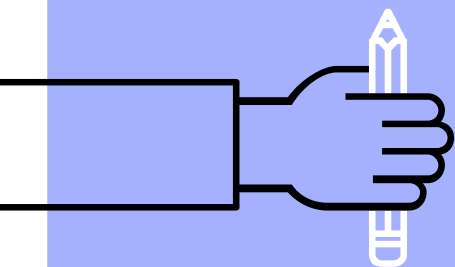
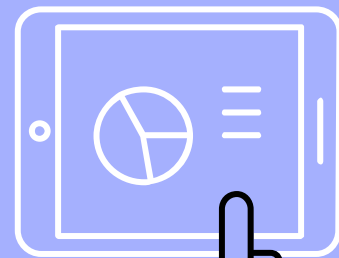


MATLAB Programming 3D Printing Project

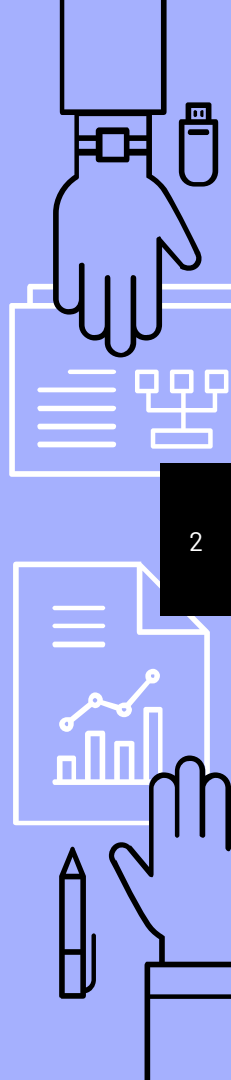
盧家鋒 Chia-Feng Lu, Ph.D.
Department of Biomedical Imaging
and Radiological Sciences, NYCU
alvin4016@nycu.edu.tw



Syllabus – 3D Rendering & Printing

Week	Topic
11	Graphic structure - curve and image display
12	3D object rendering - surface and volume rendering
13	Introduction of 3D printing and STL file output
14	Operation of 3D printer and G-code file
15 (12/22)	3D printing hands-on <u>at NYCU Maker Space</u>
16 (12/29)	Final report – video recording (10-15 min) Please provide photos of 3D printing in MakerSpace, explanation of Matlab codes, product showcase, problem/solution & discussion, and work assignment.

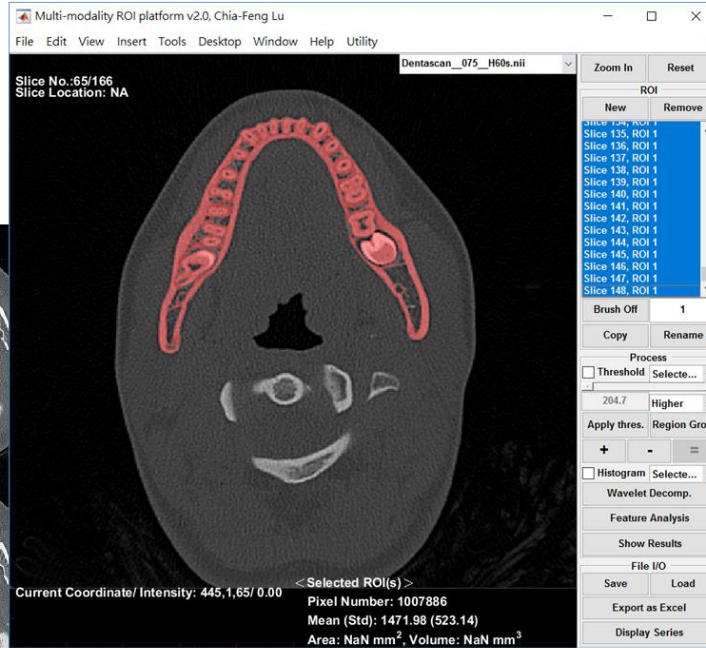
You may record the team report using Google Meet or screen recorder software.



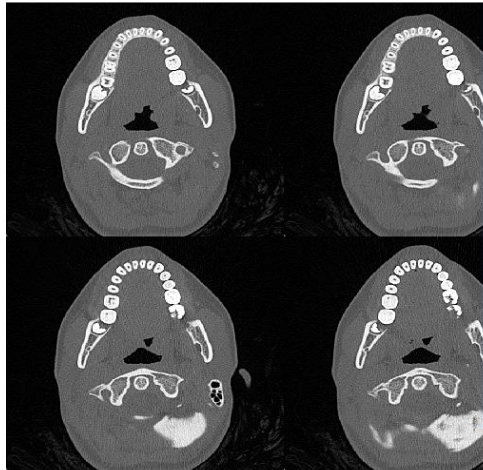
3D Printing Model

Region of interest and thresholding

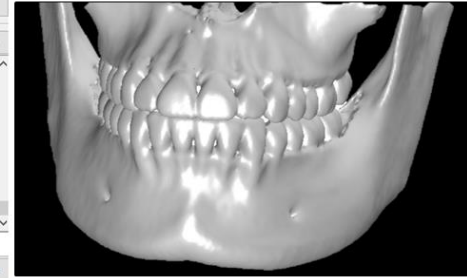
2



1 DICOM image read



3 3D rendering



4 STL file export

```

UINT8[80] - Header
UINT32 - Number of triangles

foreach triangle
REAL32[3] - Normal vector
REAL32[3] - Vertex 1
REAL32[3] - Vertex 2
REAL32[3] - Vertex 3
UINT16 - Attribute byte count
end

```

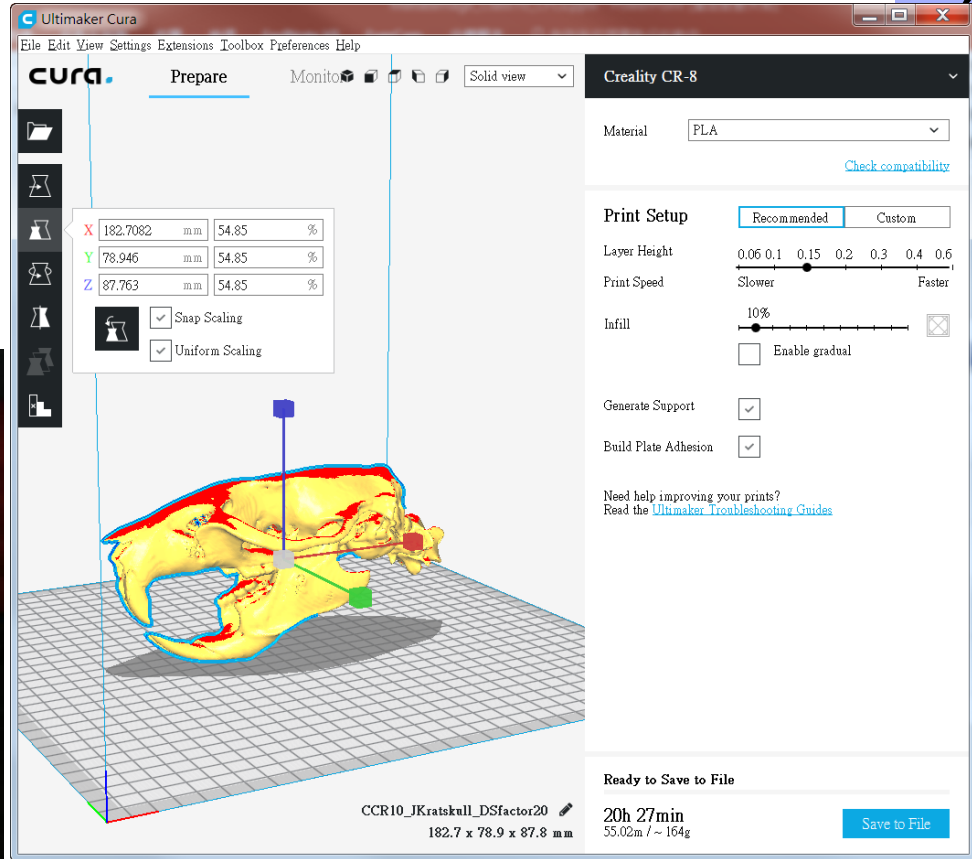
3D Printing Setup



吳孝觀 Ph.D



Produced by 2018
MATLAB course



Ultimaker Cura

File Edit View Settings Extensions Toolbox Preferences Help

cura Prepare Monitor Solid view

Creality CR-8

Material: PLA [Check compatibility](#)

Print Setup: Recommended Custom

Layer Height: 0.06 0.1 0.15 0.2 0.3 0.4 0.6

Print Speed: Slower Faster

Infill: 10% Enable gradual

Generate Support:

Build Plate Adhesion:

Need help improving your prints?
Read the [Ultimaker Troubleshooting Guides](#)

Ready to Save to File

CCR10_JKratskull_DSfactor20
182.7 x 78.9 x 87.8 mm

20h 27min
55.02m / ~ 164g

[Save to File](#)

X	182.7082	mm	54.85	%
Y	78.946	mm	54.85	%
Z	87.763	mm	54.85	%

- Snap Scaling
- Uniform Scaling

NYCU MakerSpace

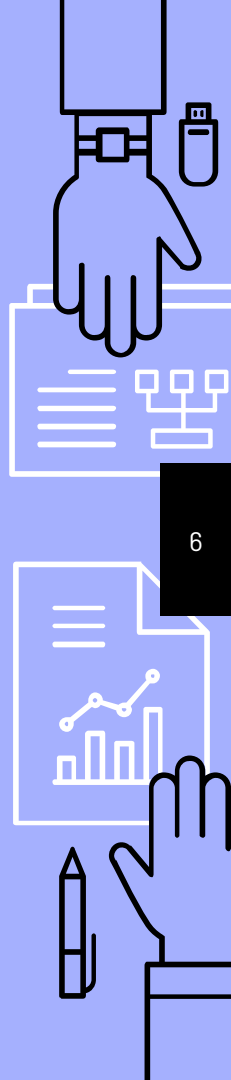




3D Printing Project

Please register for the group list!

- ▶ 72 attendees, separated into 18 groups
(4 members for each team)
- ▶ Dental CT
- ▶ Skull CT
- ▶ Spine CT
- ▶ Spine+rib CT
- ▶ Pelvis CT
- ▶ Upper limb CT
- ▶ Lower limb CT
- ▶ Heart CT
- ▶ Brain MRI
- ▶ Total body CT
- ▶ Rat skull microCT



THE END

alvin4016@nycu.edu.tw

