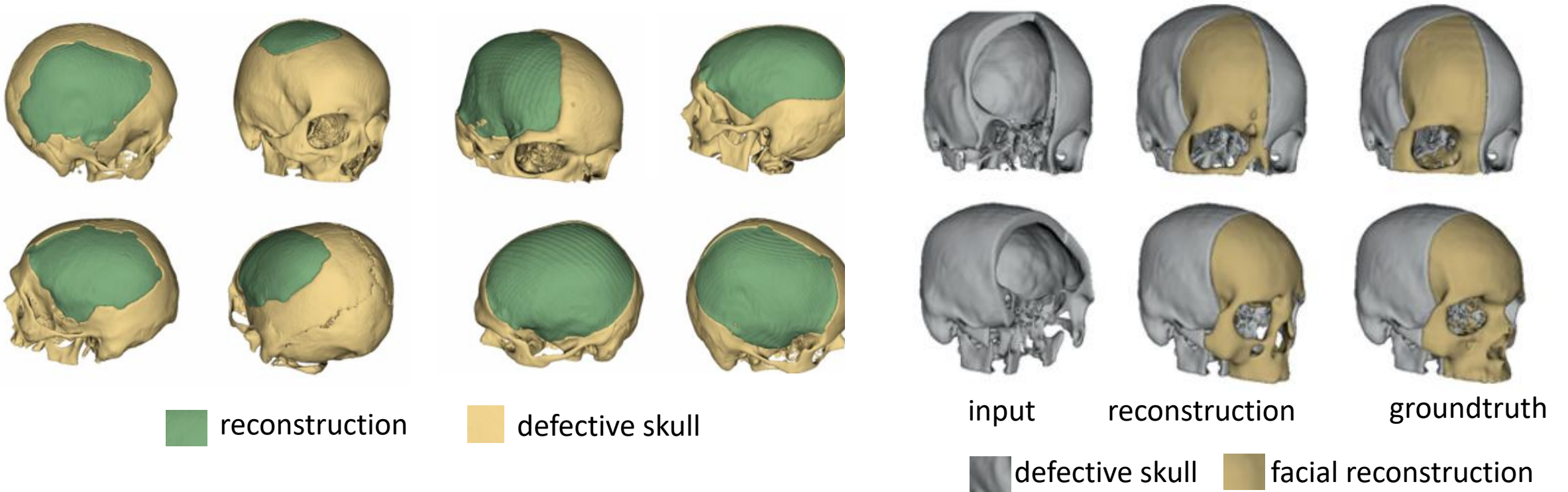


# Medical Shape Completion

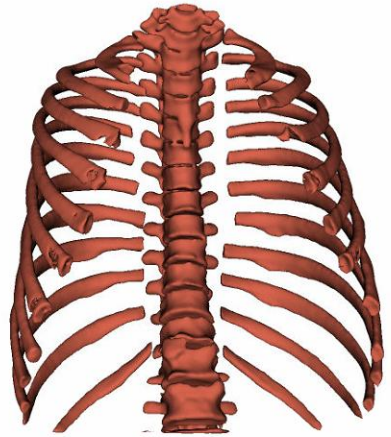
Jianning Li

# Completing Defective Skulls

for automatic craniofacial implant design



# Completing Skeleton Remains

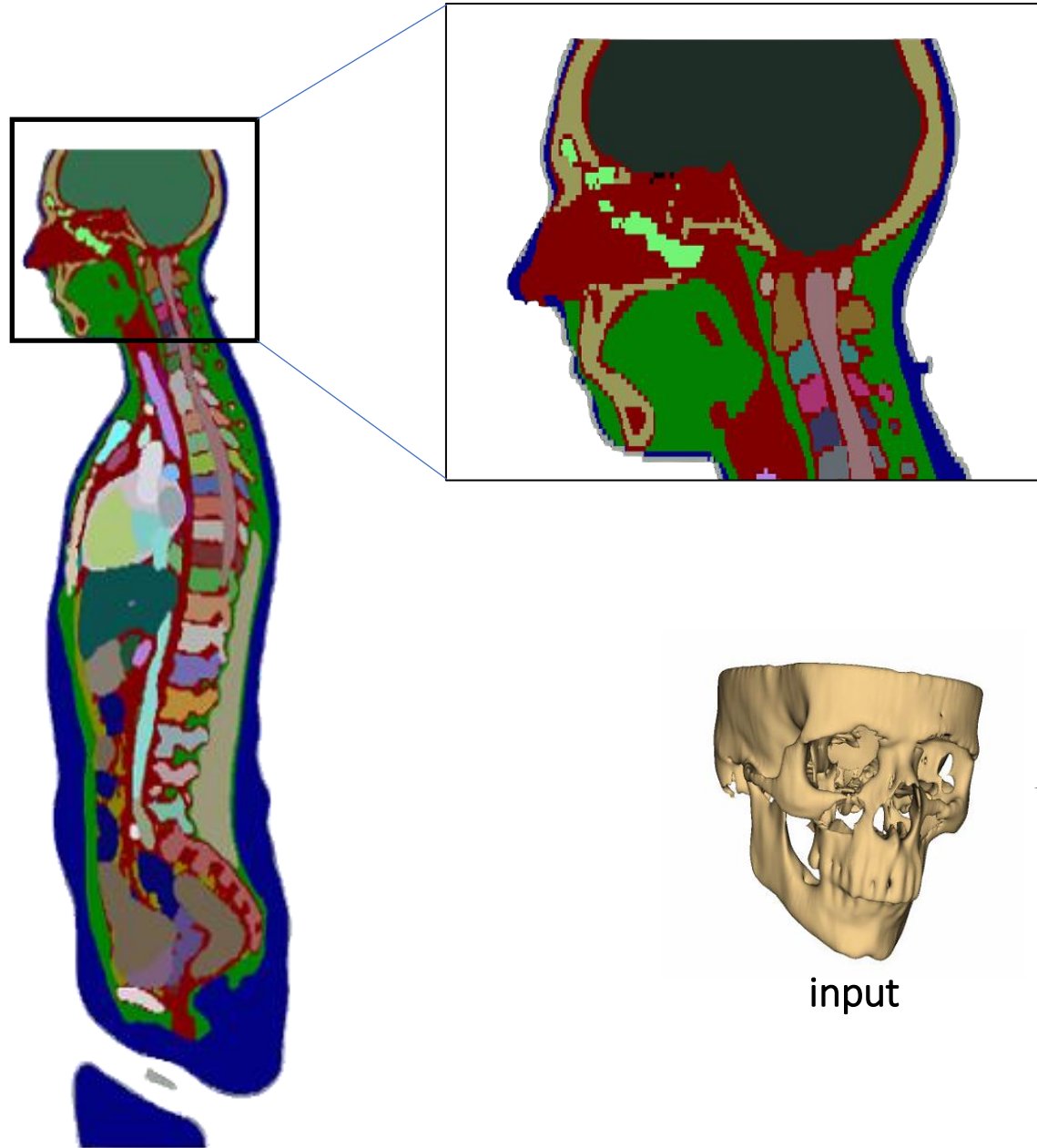


**anatomy completor**



**facial reconstruction**

# Facial Reconstruction



- skull
- muscle
- fat
- skin

input

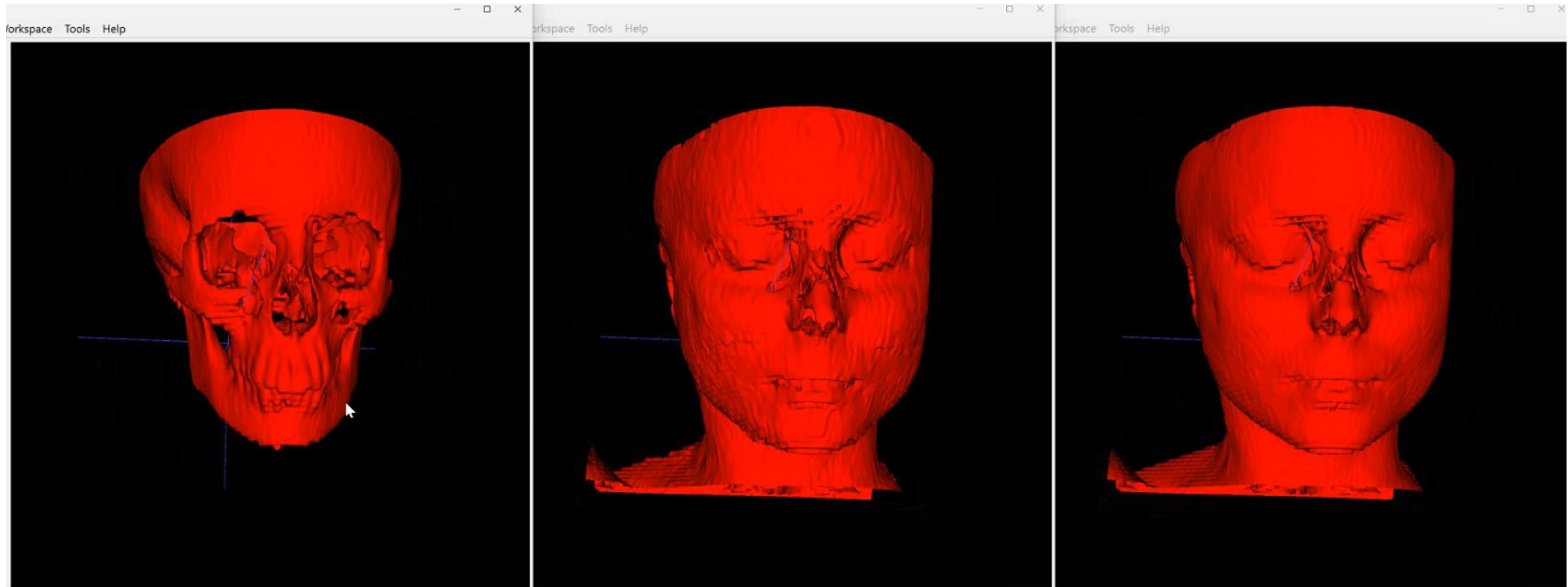
ground truth

# Facial Reconstruction: Gender

input

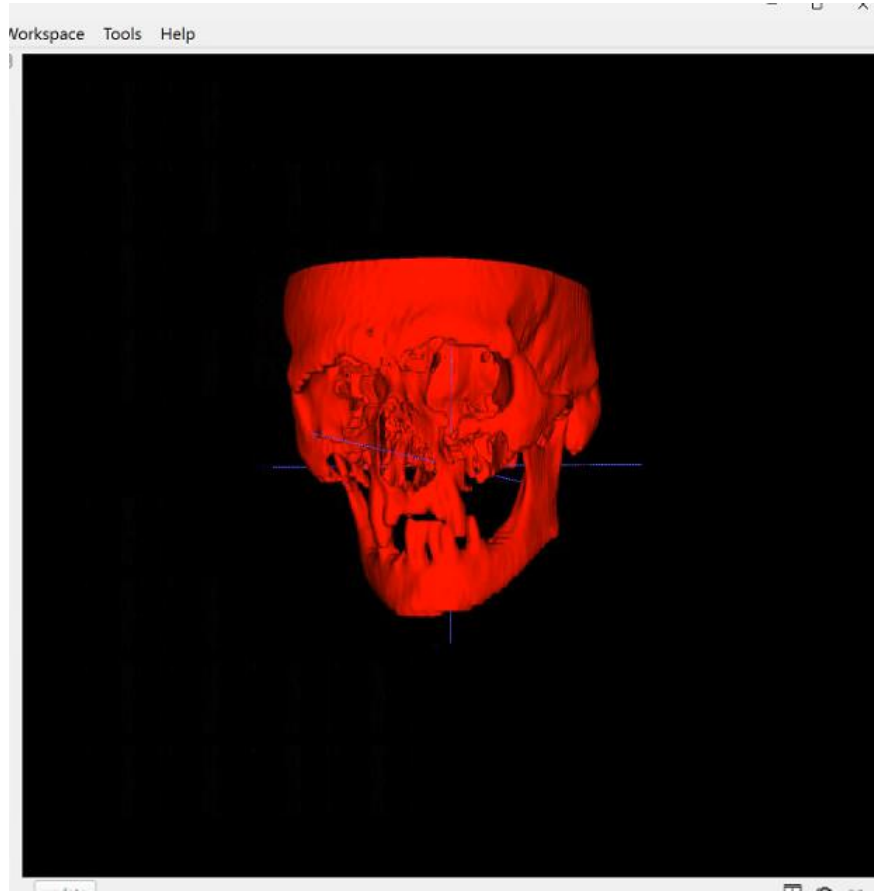
prediction

ground truth

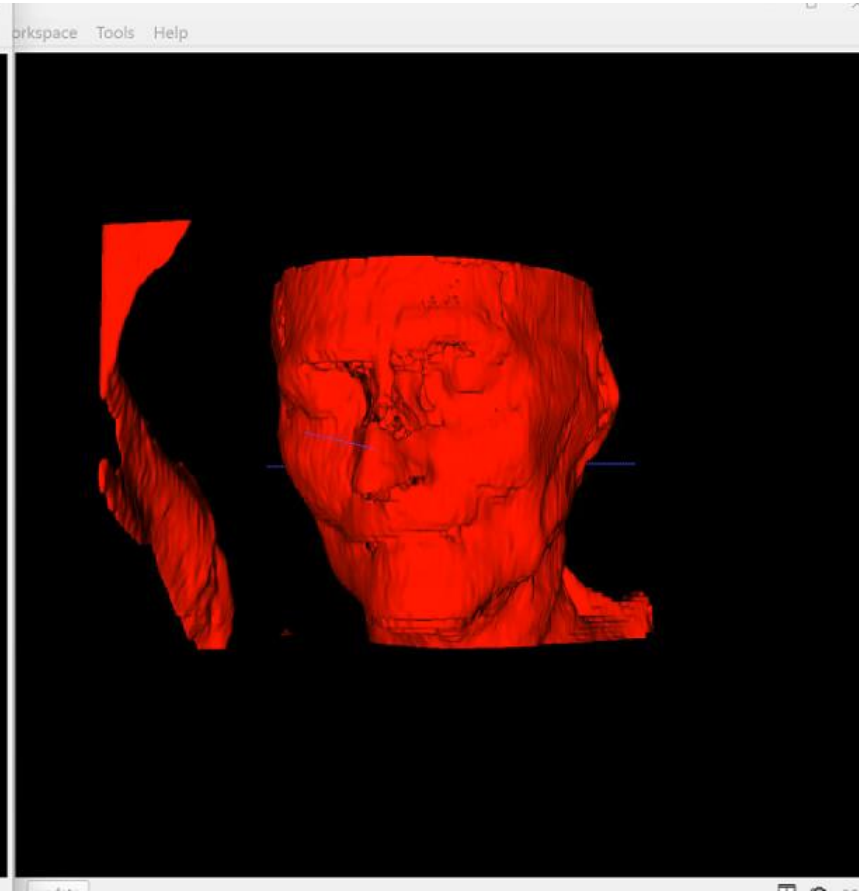


# Facial Reconstruction: Age

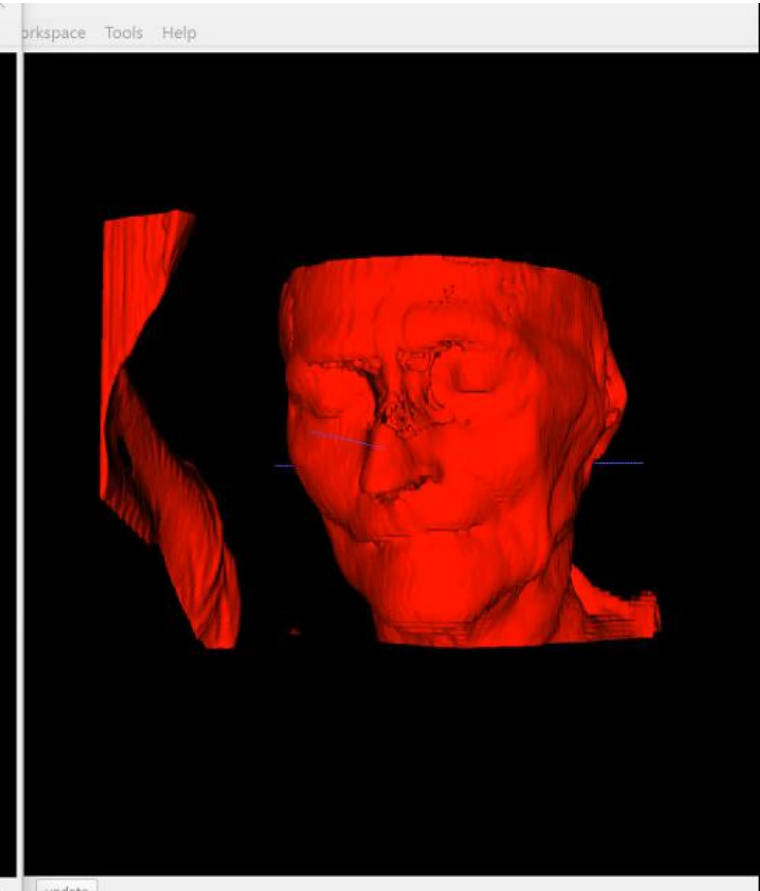
input



prediction

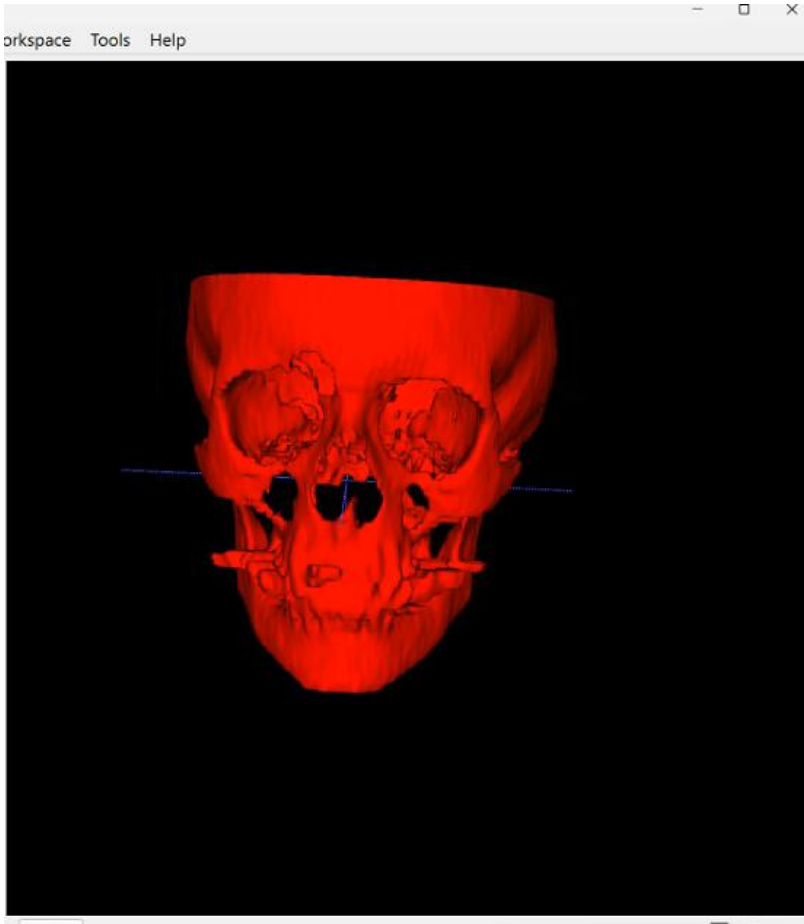


ground truth

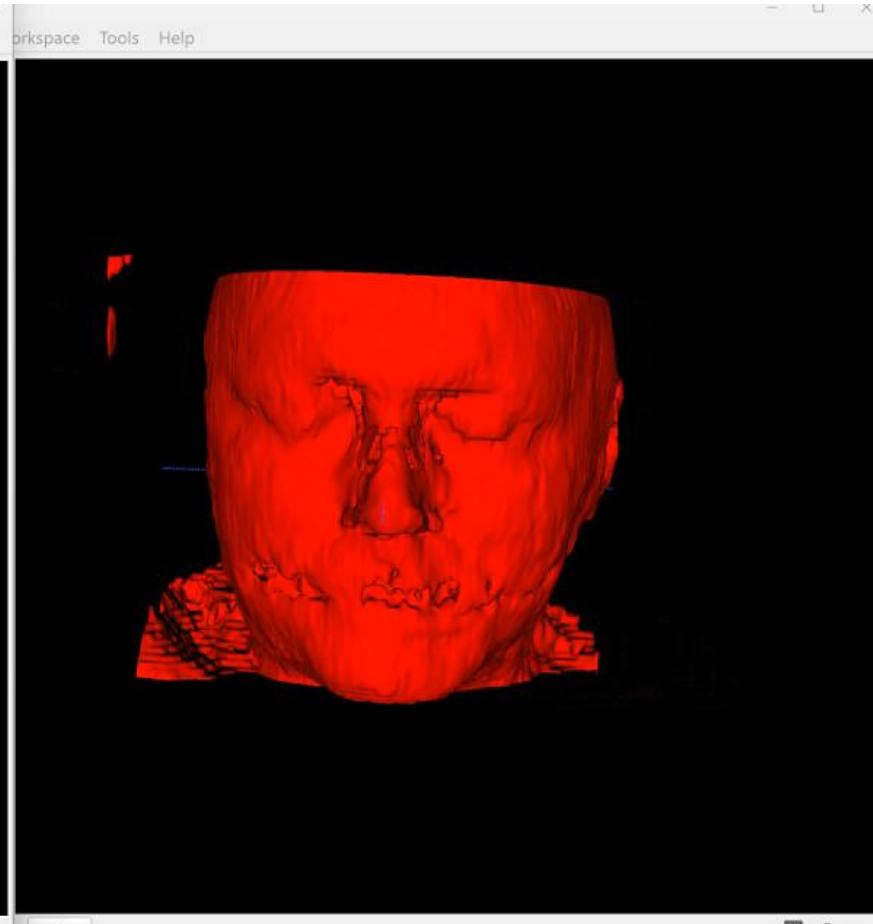


# Facial Reconstruction: Demographic

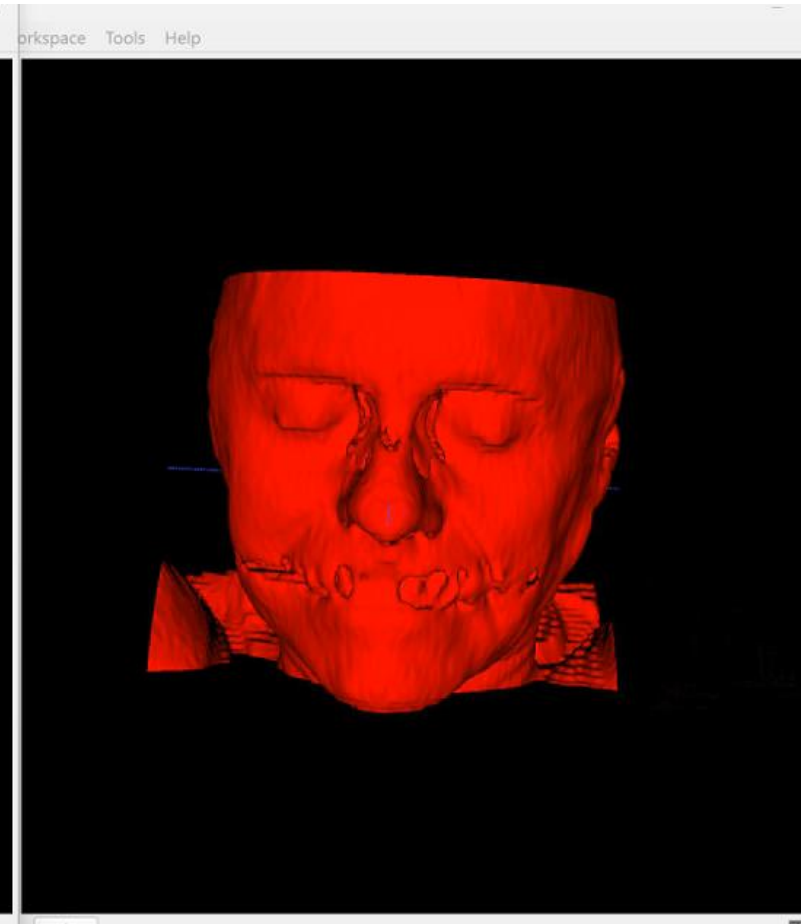
input



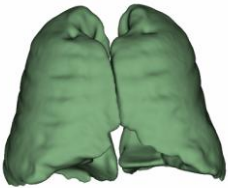
prediction



ground truth



# Multi-class Anatomy Completor



lung



heart



spleen



stomach



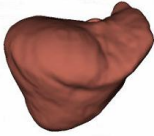
pancreas



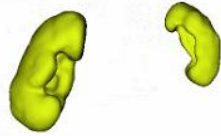
spine



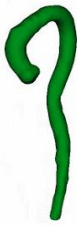
rib cage



liver



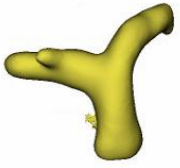
kidney



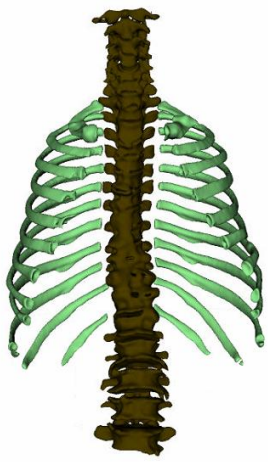
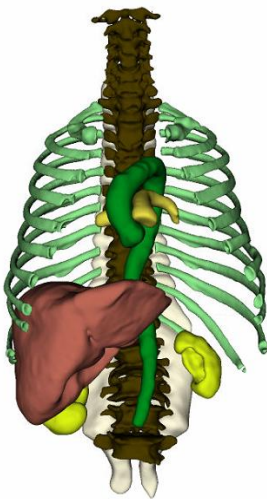
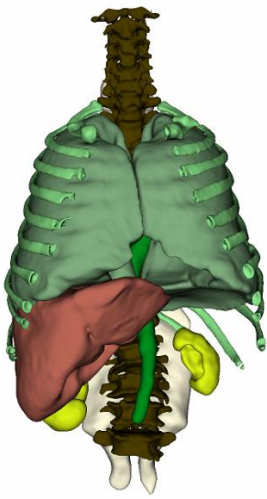
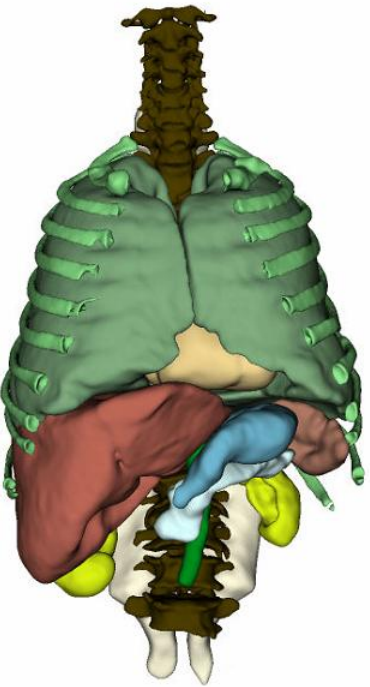
aorta



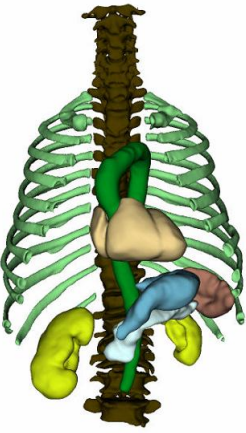
autochthon  
muscles



pulmonary  
artery



...

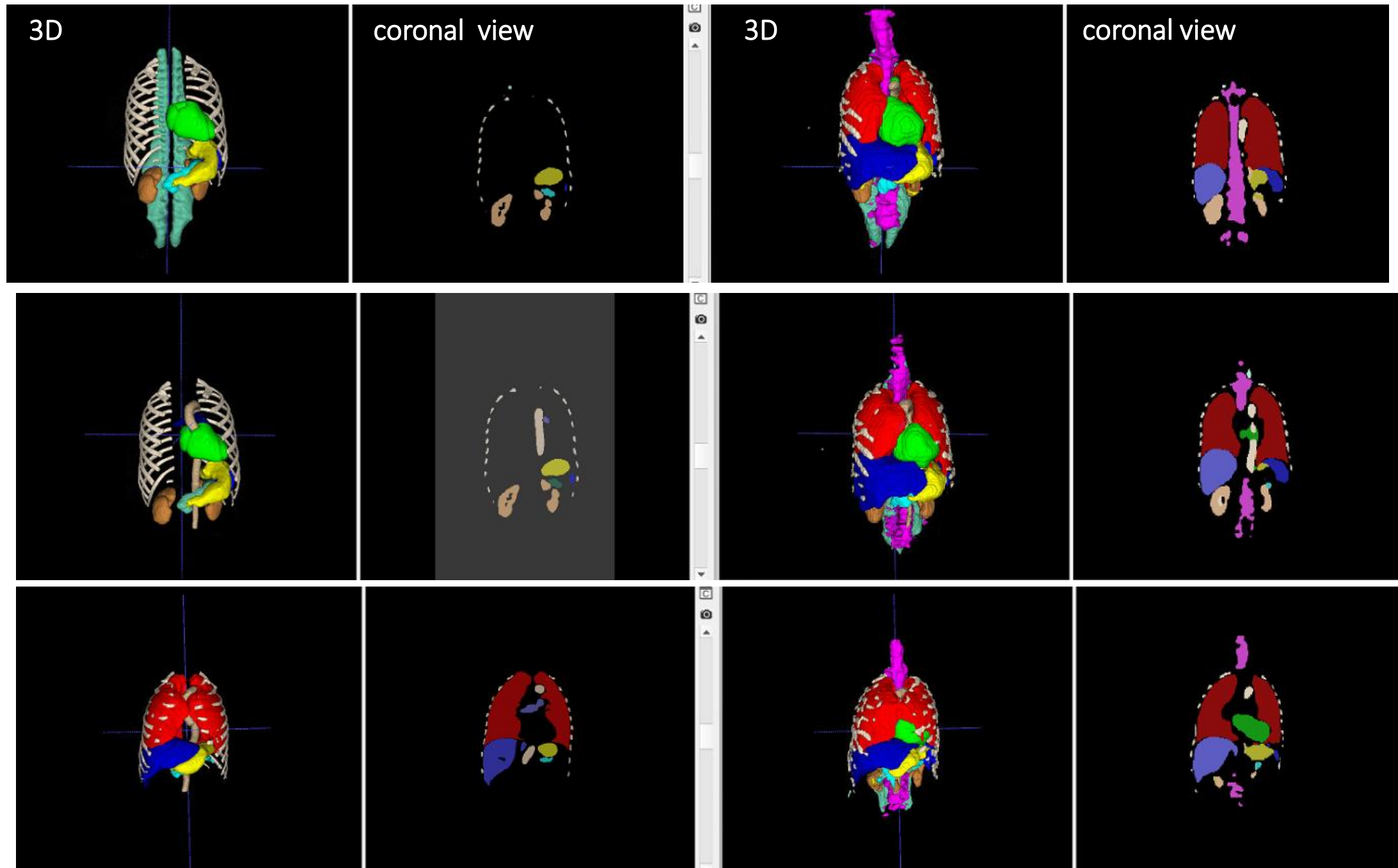


removing random organs



input

reconstructions

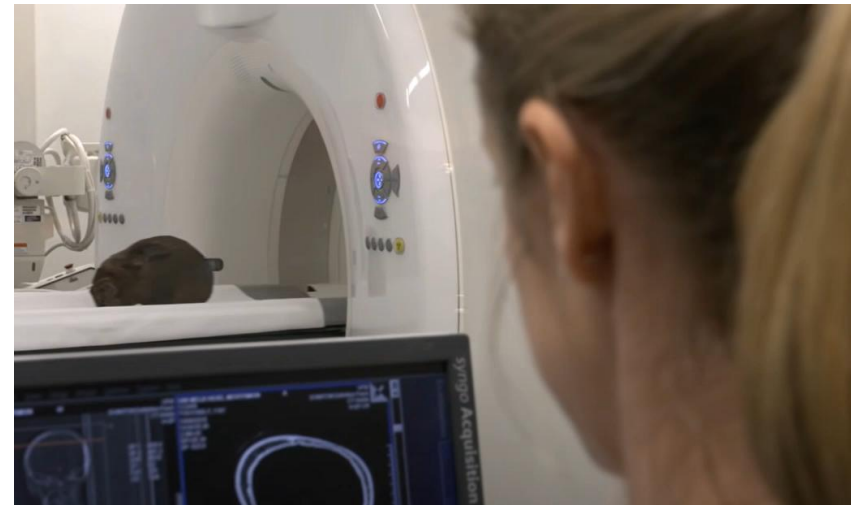


# What are the applications?

- Forensic facial reconstruction: archaeology, criminal investigation

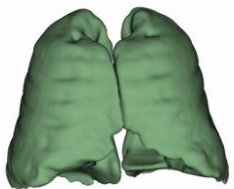


youtube@ DurhamUniversity

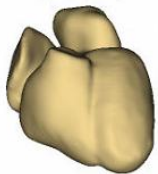


youtube@ The University of Melbourne

- 3D-printing organs for artificial organ transplantation



lung



heart



spleen



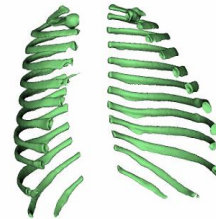
stomach



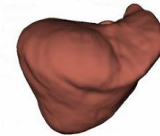
pancreas



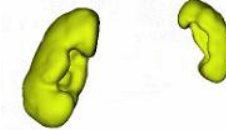
spine



rib cage



liver



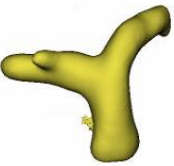
kidney



aorta



autochthon  
muscles



pulmonary  
artery