UNIVERSITÀ DEGLI STUDI FIRENZE
DIEF DIPARTIMENTO DI INGEGNERIA INDUSTRIALE

October 17th–18th, 2022

AM FOR CUSTOM MADE SURGERY TEMPLATES

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ADDITIVE 4 BIOMEDICAL

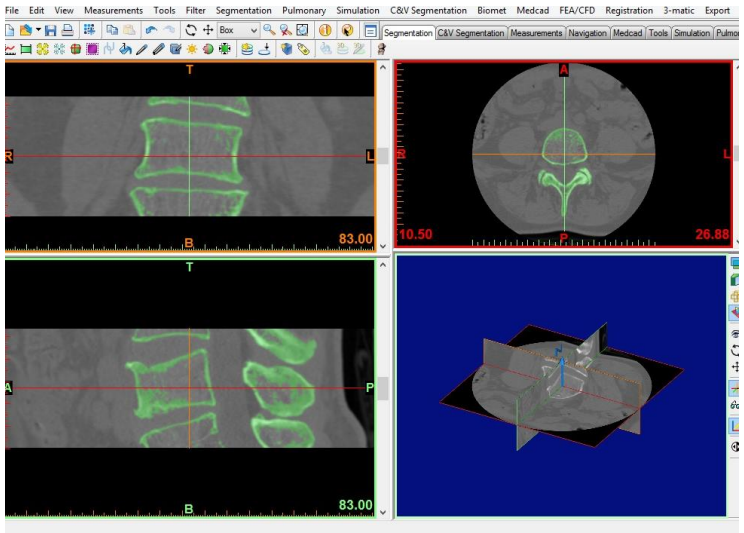
SC 09/A3 CoCo AM Additive Manufacturing

ASSOCIAZIONE NAZIONALE DISEGNO E METODI

COMET

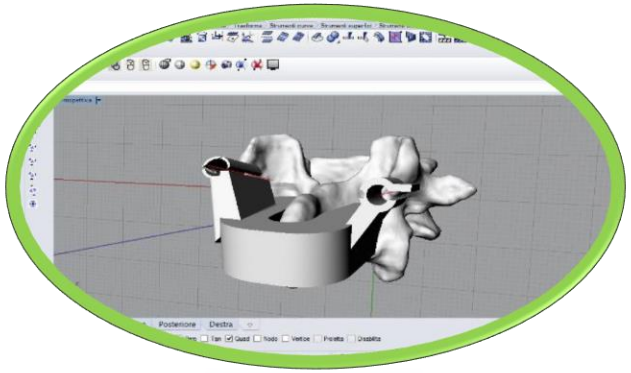
aias

SPINE JIG FOR PEDICLE ARTHRODESIS

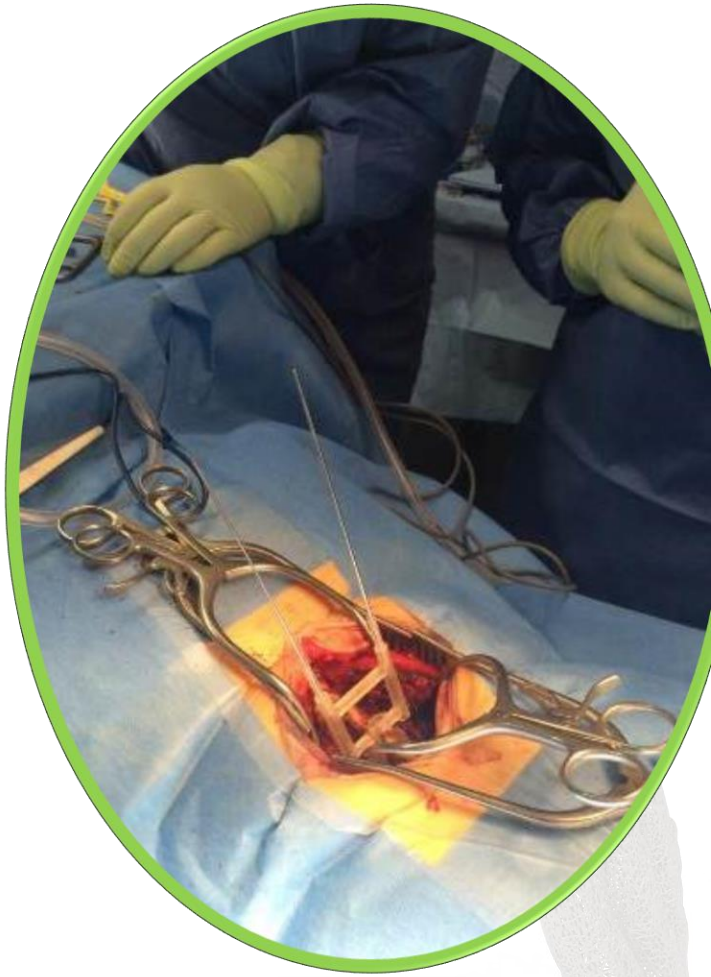


SEGMENTATION FROM CT SCAN

VERTEBRA & TEMPLATE



CAD RECONSTRUCTION & DESIGN

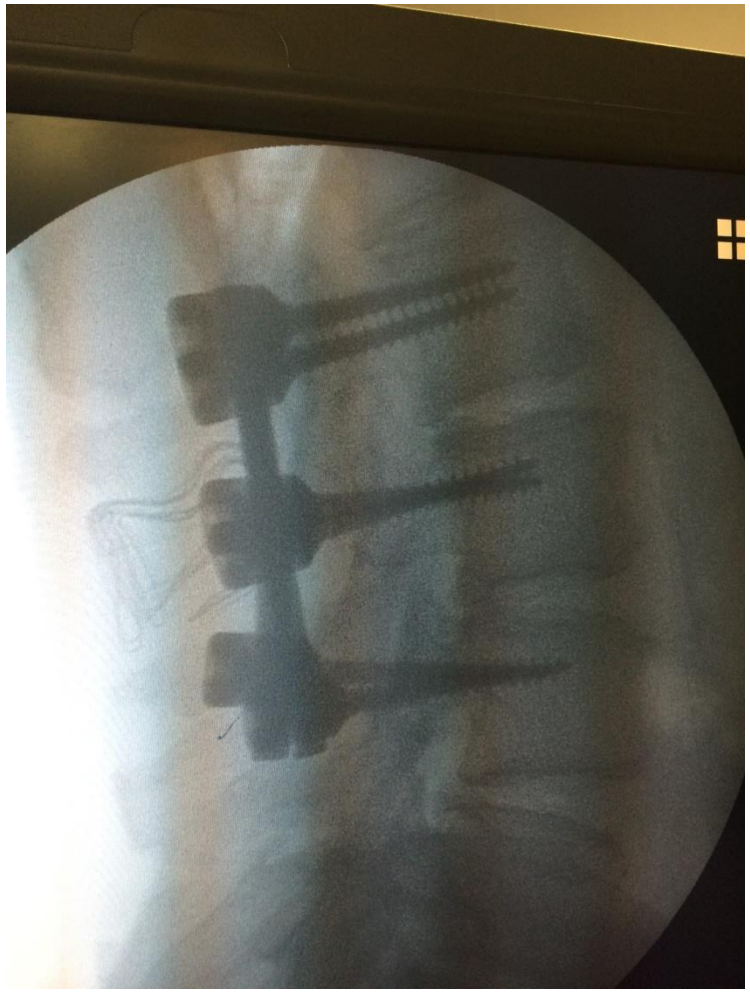


IN VIVO APPLICATION

ADDITIVE 4 BIOMEDICAL

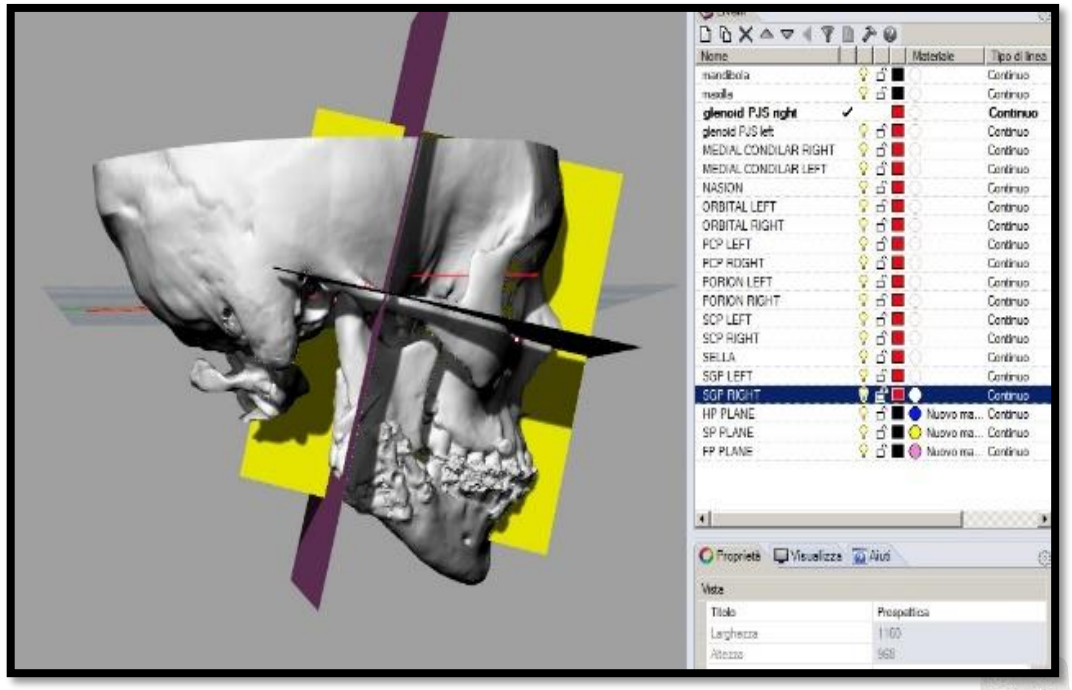
SPINE JIG FOR PEDICLE ARTHRODESIS

Pedicle Screws Implant



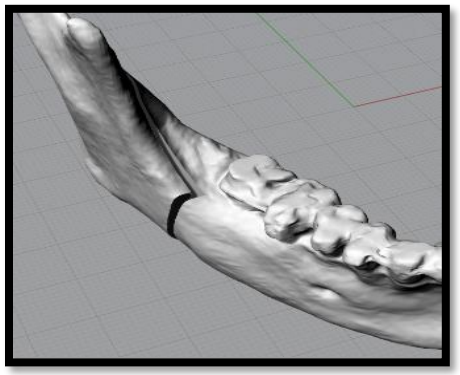
BILATERA SAGITTAL SPLIT OSTEOTOMY – A CUSTOM MADE POSITIONING TEMPLATE

- SEGMENTATION OF BONES STRUCTURE
- IDENTIFICATION OF ANATOMICAL SYMMETRY PLA
- IDENTIFICATION OF ANATOMICAL LOCATION POINTS

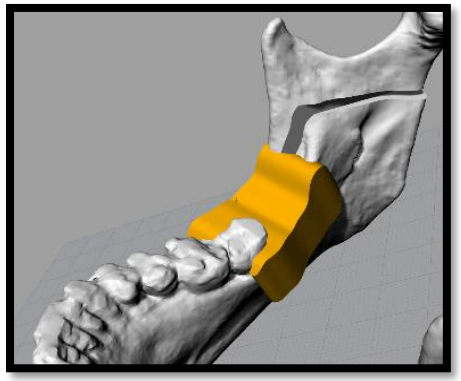


BILATERA SAGITTAL SPLIT OSTEOTOMY – A CUSTOM MADE POSITIONING TEMPLATE

CUT SIMULATION

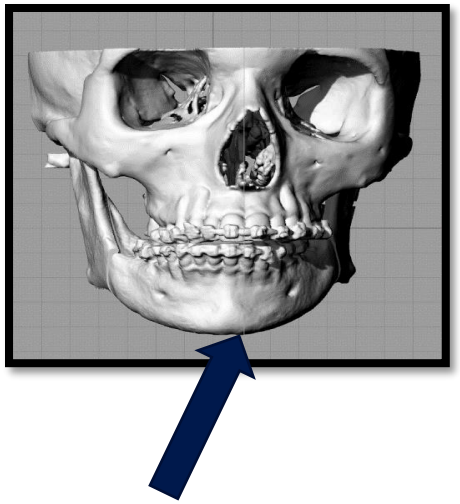


DIMA

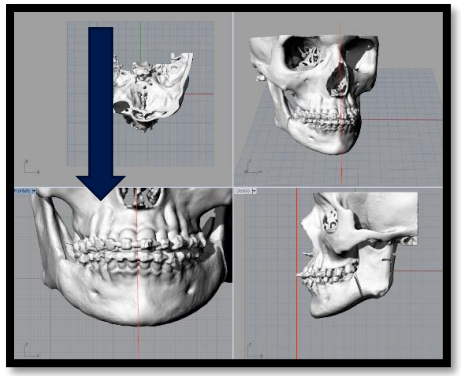


It was possible positioning the mandibular Braches as from CAD project, with the application of a template obtainedf from «virtual cast» of the mandibular structure

before

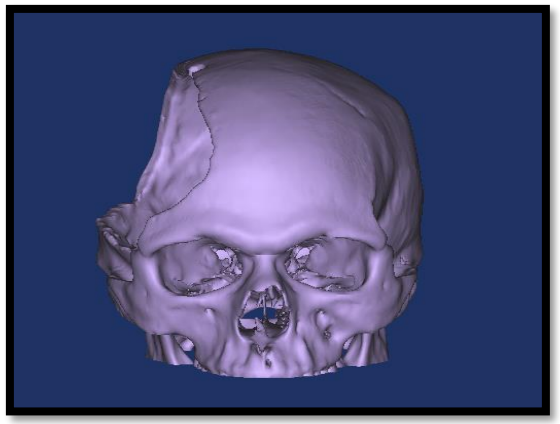


after

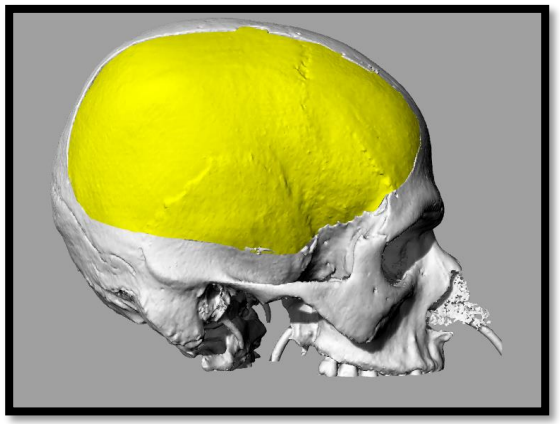


DIMA must be designed on «correct» configuration of mandibular segment

MIRRORED CUSTOM MADE CRANIOPLASTY PLATE



Segmentation



Mirroring of cranial gap

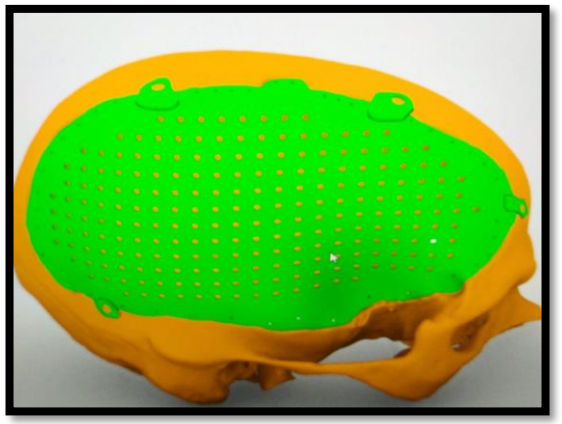
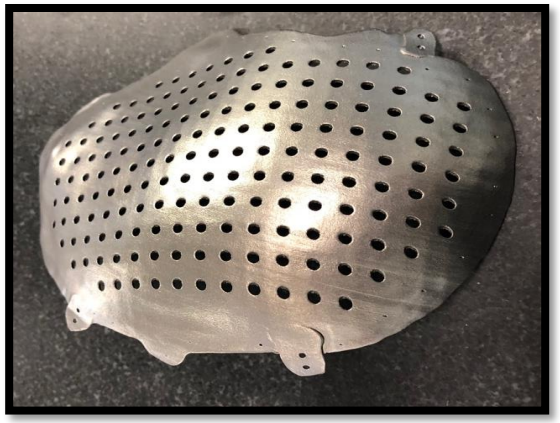
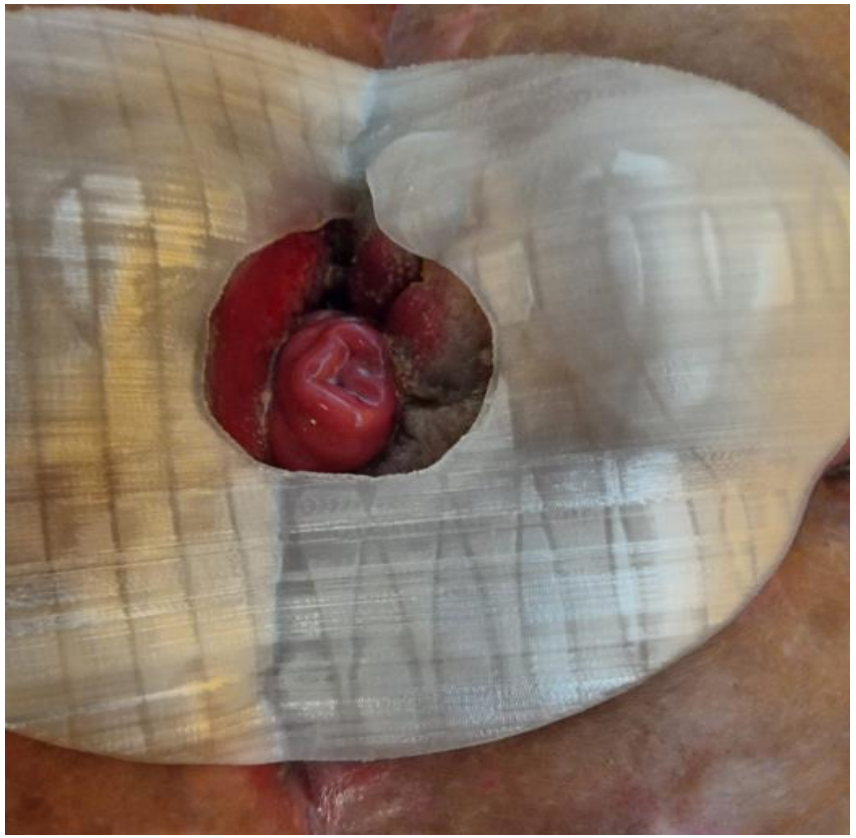


Plate Design

Titanium plate



CUSTOM MADE SUPPORT FOR UMBILICAL OSTOMY



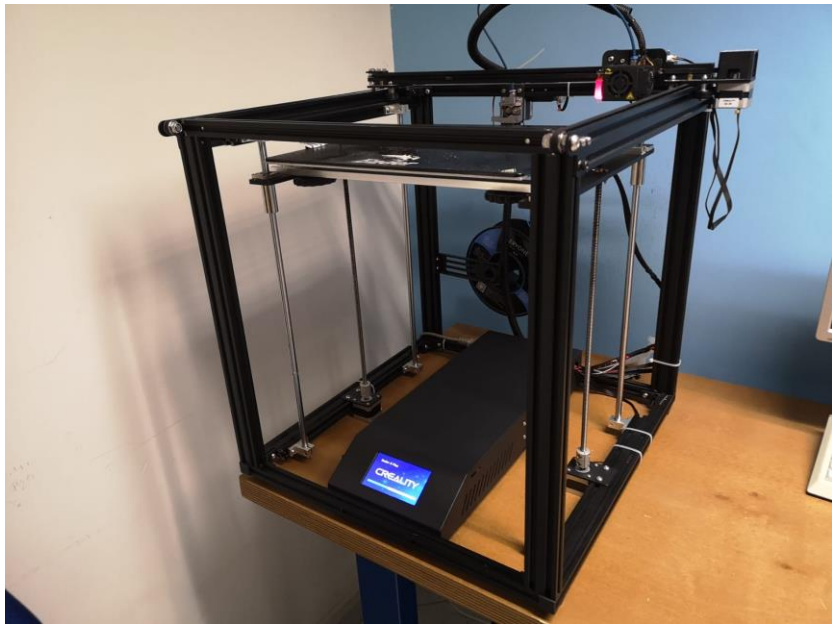
The singular position of the stoma did not allow to Apply the classic «bag» without avoiding the Leakage of intestinal fluids

With a reverse engineering process, the affected Area was scanned and a support designed. Remodeling the typical concavities and convexities of the umbelical area, the support allow the application of the classical medical aids for Ostomy

AM SOLUTIONS

CREALITY ENDER 5 PRO PLUS

- Building Area 350*350*400 (mm)
- Max resolution 0,05 mm
- FDM (1,75mm)
- Materials: PLA, PETG, HIPS, TPU



AM SOLUTIONS

ZORTRAX M200 PLUS

- Building Area 200*200*180 (mm)
- Max resolution 0,03 mm
- LPD (1,75mm)
- Materials: PLA, PETG, HIPS, TPU, ABS, ASA, PCABS, NYLON, ASAX

AM SOLUTIONS

ELEGOO MARS PRO 2

- Building Area 129*80*160 (mm)
- Max resolution 0,03 mm
- LCD MSLA
- Materials: all 405nm resin

AM SOLUTIONS

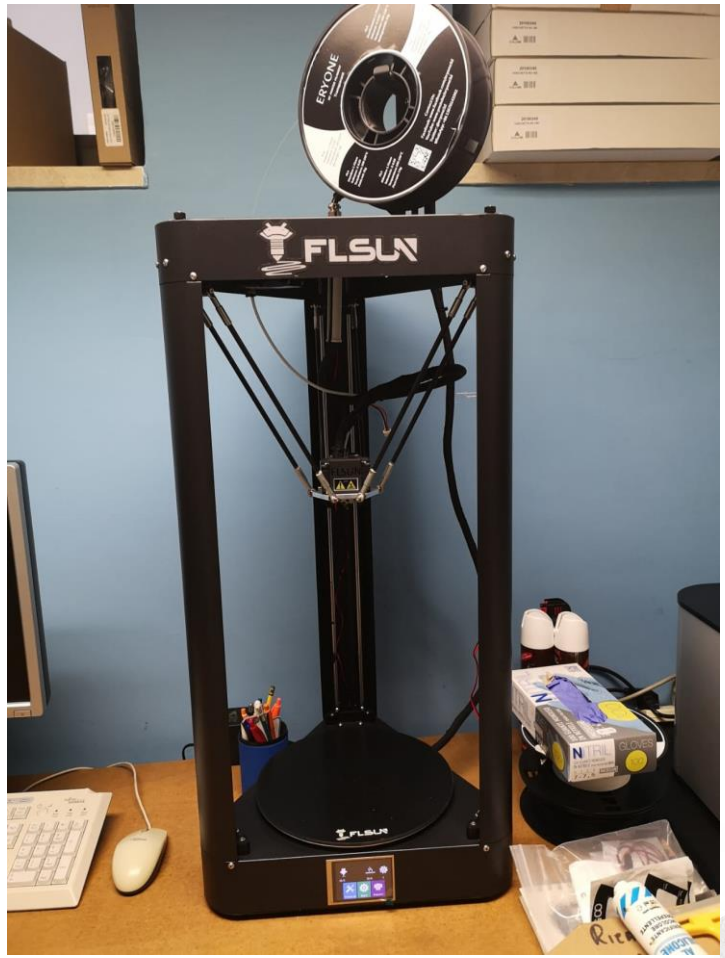
ELEGOO SATURN

- Building Area 192*120*200 (mm)
- Max resolution 0,03 mm
- LCD MSLA
- Materials: all 405nm resin

AM SOLUTIONS

FLSUN QQ-S PRO

- Building Area 255*255*360 (mm)
- Max resolution 0,05 mm
- FDM (1,75mm)
- Materials: PLA, PETG, HIPS,TPU



AM SOLUTIONS
DWS 3500 SD

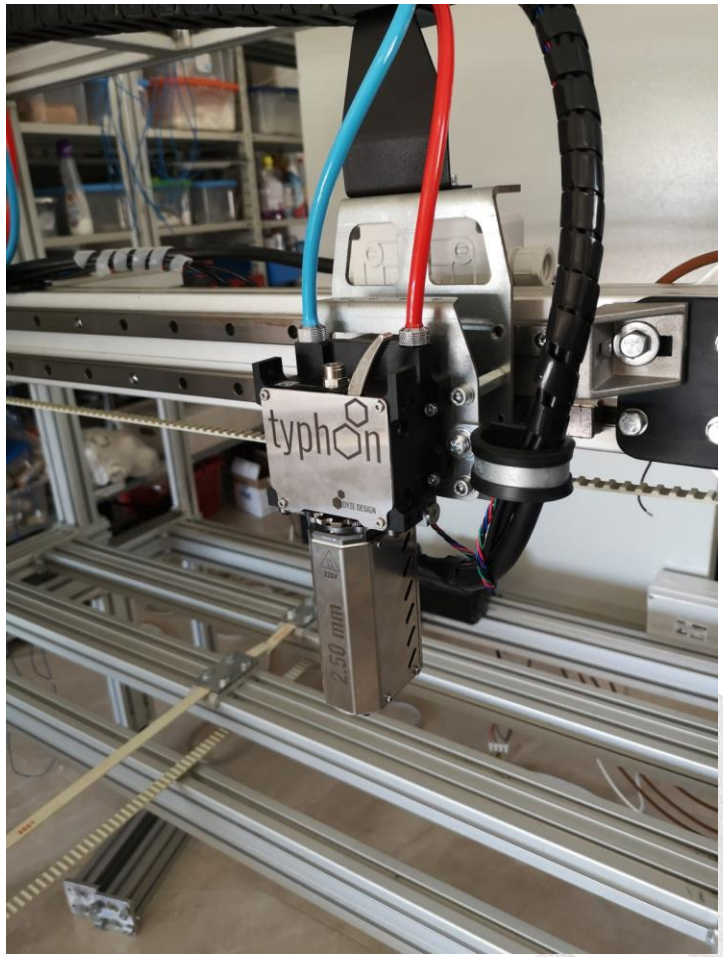
- Building Area 140*140*180 (mm)
- Max resolution 0,01 mm
- Blue Laser SLS
- Materials: DWS resins (also biocompatible and flexible)

ADDITIVE 4 BIOMEDICAL

AM SOLUTIONS

TECHNODESIGN P.R.O.S.H.A.

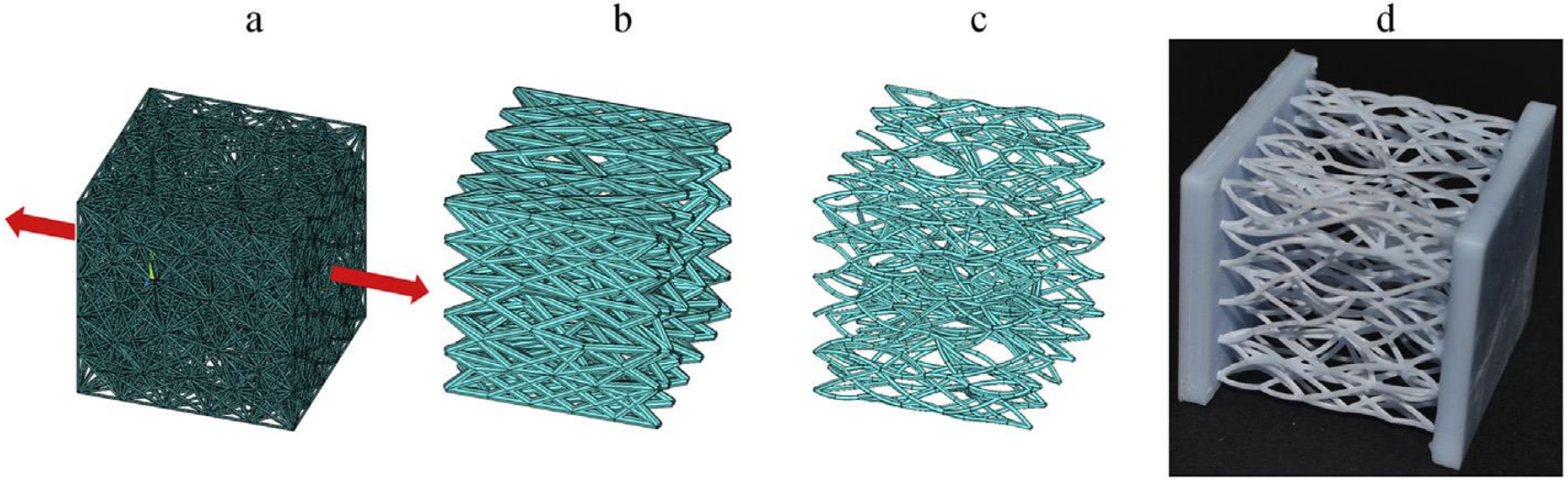
- Building Area ∞* ∞ *750 (mm)
- Max Resolution 2.5 mm (Large scale printer)
- High Flow system
- Materials: PLA, PETG, HIPS, TPU, PEEK



TISSUE ENGINEERING

Novel "load adaptive algorithm based" procedure for 3D printing of micro space-frame based components showing parametric curved fibers

Effect of the algorithm elaboration on the cubic RVE: a) isotropic cubic lattice structure showing the direction of the imposed displacements (X axis); b) cubic lattice structure showing resized beams oriented along the X axis; c) cubic lattice structure showing curved beams; d) 3D printed polymeric specimen.



COMPUTER-AIDED TISSUE ENGINEERING

Optimization of an ad hoc Realized Space Frame Structured RVE for FEM Modeling of Nanoporous Biopolymeric Scaffolds Obtained by Supercritical Fluids Assisted Process