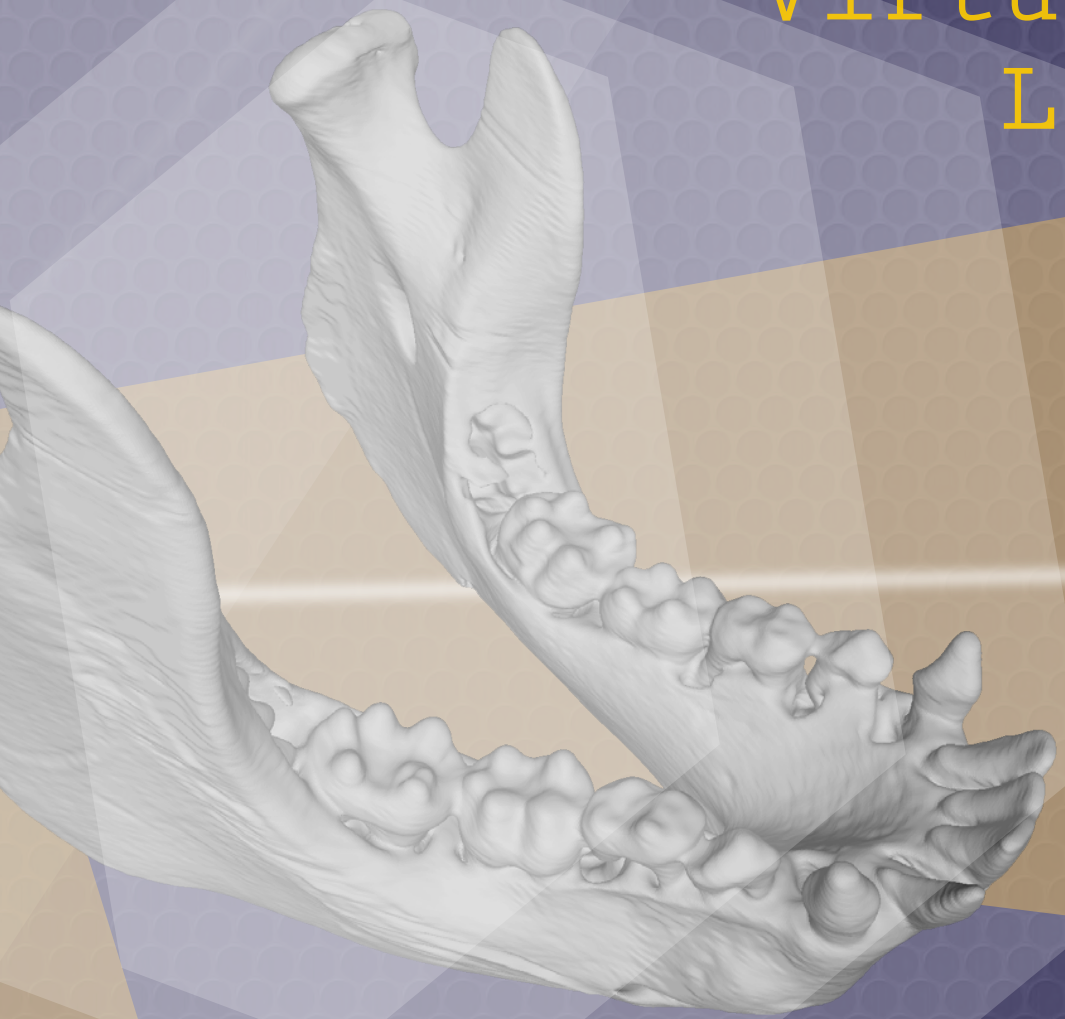
3D Virtual Lab



Institut Català de Paleontologia
Miquel Crusafont

INSTALLATIONS

The **3D Virtual Lab** is located in the center of Sabadell in the Institut Català de Paleontologia Miquel Crusafont's building. Our aim is to make it available for organizations that require a specialized human and technical team for **the digitization of all kinds of items.**

The 3D Lab is equipped with the main digitization tools, including an industrial computed **tomography equipment** and latest generation of **laser and photogrammetric scanning equipment**, covering extensively the needs of any customer.

INDUSTRIAL COMPUTED TOMOGRAPHY

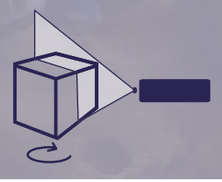
Facilities consist in a 12 square meters bunker with an X-ray tube with a **450 kV** maximum peak voltage and a maximum power of **3.3 mA**.

It allows to **analyze in a non-destructive form**, samples and prototypes from the automotive, metallurgy, welding, quality control, construction, etc. fields.

The equipment is able to analyze **objects up to 1.2 meters long, 0.5 meters wide and 500 kg of weight.** Even large pieces can also be analyzed, scanning the object in different separated parts, as our software is able to combine them digitally.

The equipment allows obtaining both **qualitative and quantitative results.**

It offers the possibility to work with two different focus – fine and standard – depending on the customer requirements.



The lab has a freight elevator that connects it directly to the outside and facilitates the entry of large volume objects.

SERVICES

IMAGE SERVICE AND CAD

Comprehensive service: Once ended the analysis process and once the tomography images have been acquired, the laboratory provides the customer the service image processing and **3D objects modelling** by CAD.

Due to the 3D Virtual Lab staff's experience in processing and interpretation of tomographic images combined with powerful workstations, the customer will obtain a high-resolution **three-dimensional model** of the sample analyzed.

High-powered workstations to obtain the maximum performance of the obtained data

3D PRINTING SERVICE

The **high resolution rapid prototyping** allows us to make real any design, obtained from CAD software, as well from the digitization model.

The printed piece is made with a plastic material with a similar resistance to ceramic.

LASER AND PHOTOGRAMMETRIC SCANNING

The **Next Engine** laser equipment allows to scan samples of medium size (with a range of few centimetres to half a meter length) to obtain high-resolution models of the sample.

The **photogrammetrical digitalization** offers the possibility to get the geometric properties of the studied object from photographies.

The models obtained from these techniques can later be edited using CAD software to confer a certain mesh and texture.

HUMAN STAFF

The **3D Virtual Lab staff** has an extensive experience in the objects digitization field, and has worked for several years using radiographic and tomographic techniques in both the medical and the industrial world. We are pioneers in the use of photogrammetric and laser systems applied to cultural heritage.

TECHNICAL CHARACTERISTICS

INDUSTRIAL COMPUTED TOMOGRAPHY

X-Ray Tube features

Brand: YXLON

Model: Y.TU450.D09

Focal spot size:

- Small focus: 0.4 mm
- Standard focus: 1mm

Voltage range: 20-450 kV

Increment: 1 kV

Maximum power:

- Small focal spot: 0.7 kW
- Standard focal spot: 1.5 kW

Maximum tube power

- Small focal spot: 1.6 mA
- Large focal spot: 3.3 mA

Inherent filtration: 5mm de Be + 3mm de Al + 0.5 mm de Cu

Detector characteristics

3840 cadmium tungstate (CdWO4) channels made by the optical coupling between a scintillator matrix and a photodiodes row.

Center-to-center distance between adjacent photodiode: 0.395mm

Scintillator dimensions: 0.349mm x 1.14mm x2.56mm

Photodiode effective area: 0.295mm x 0.6mm.

Detector resolution: 267 microns

Interslice distance range: 1 mm, 0.5 mm, 0.25mm, 0.1 mm

Characteristics for computed tomography sample

Maximum length: 1.2 meters

Maximum thickness: 0.5 meters

Maximum weight: 500 kg

IMAGE PROCESSING AND CAD

Software

Avizo (VSG)

ImageJ and Fiji (NIH)

Meshlab (ISTI-CNR)

Rhinoceros (McNeel)

LASER AND PHOTOGRAMMETRICAL DIGITIZATION SERVICE

Laser equipment: Next Engine 3D laser scanner

Photogrammetry performed with digital camera and photogrammetrical software

3D Virtual Lab

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