

3D SCANNING AND PRINTING

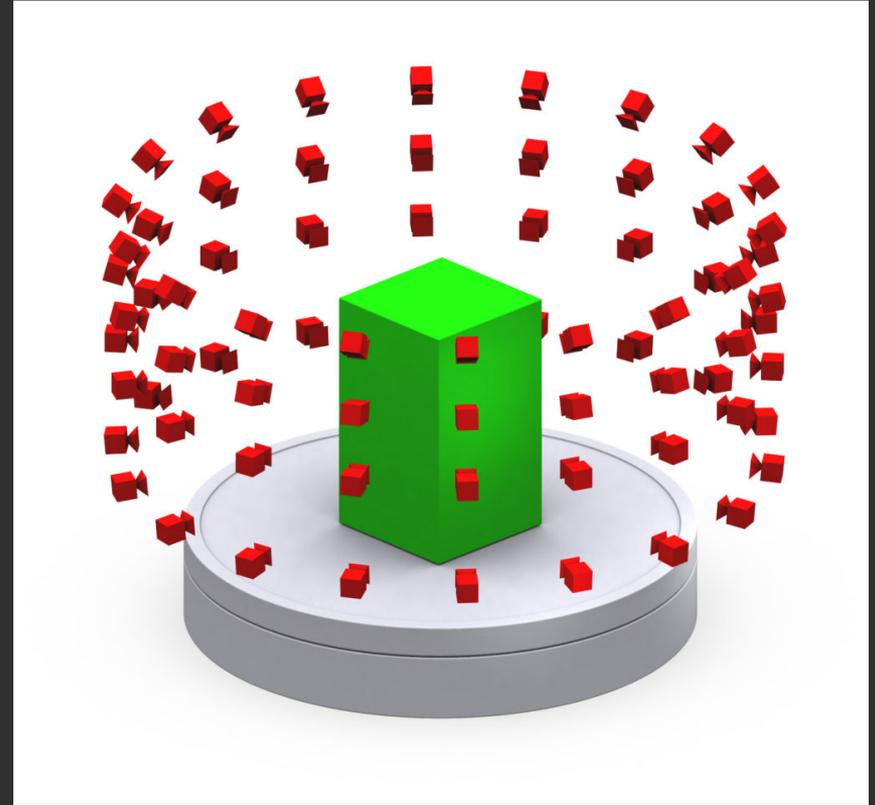
Guide of good practice

Intro to 3d scanning workflow

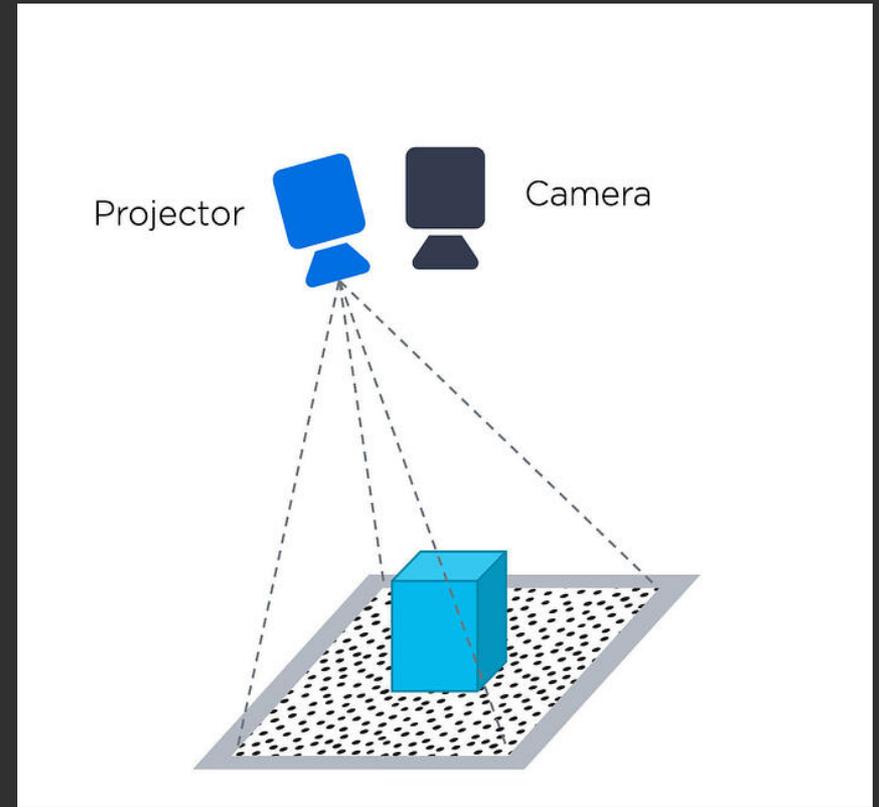
3d scanning technologies, what's out there?

- Photogrammetry
- Using structured light
- Laser scanning
- Computerized tomography (CT)

Photogrammetry

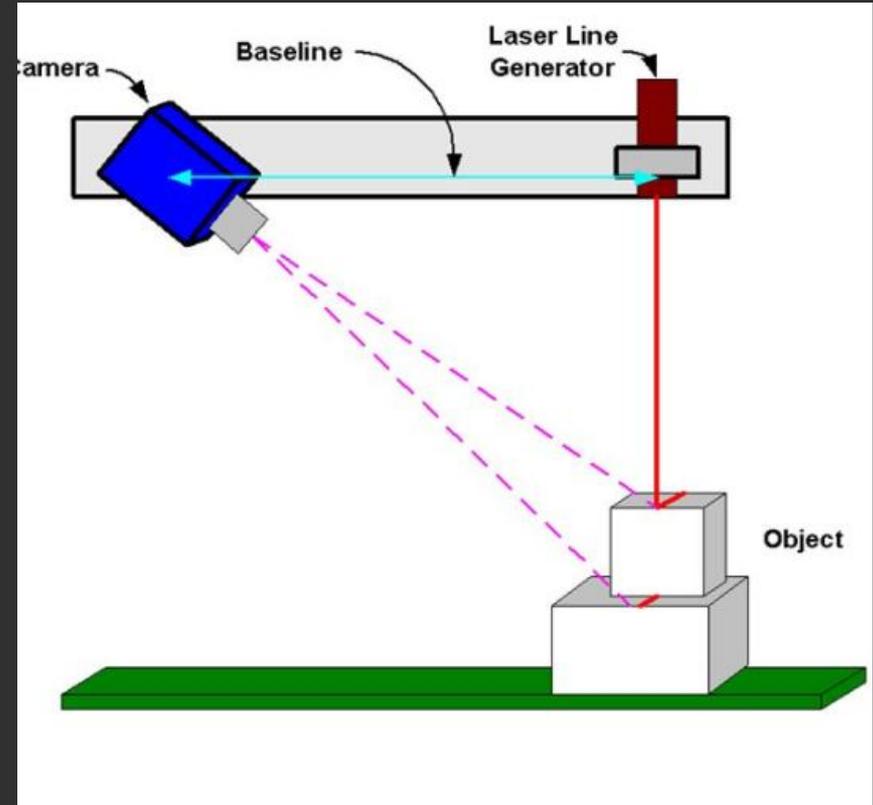


Structured light scanning



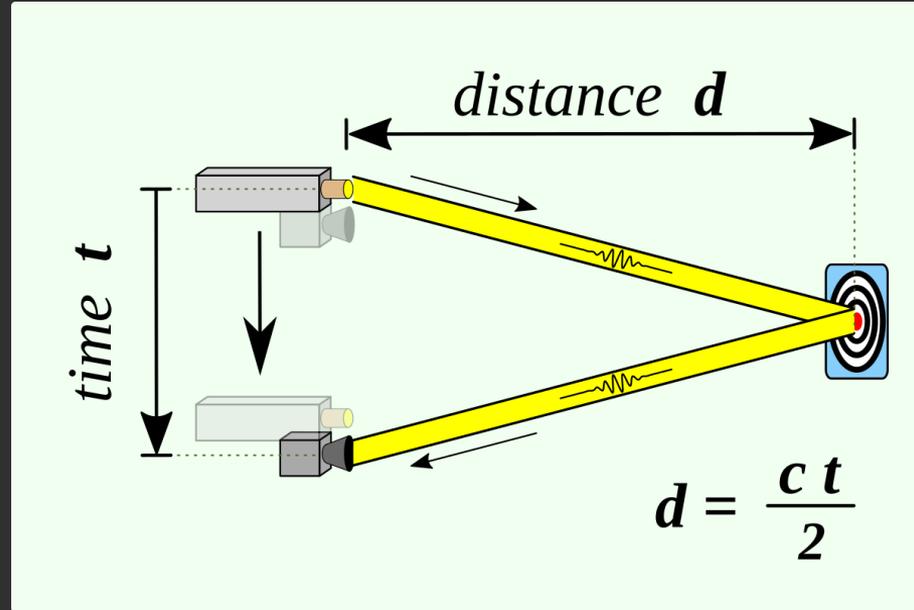
Laser scanning

Triangulation

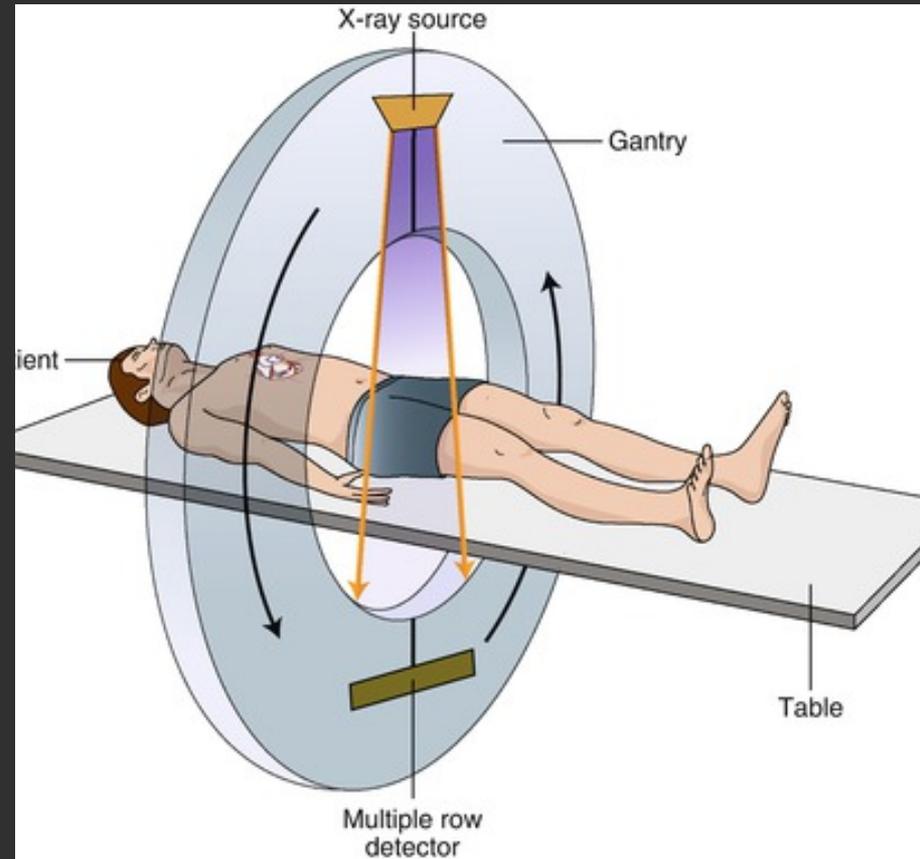


Laser scanning

Time of flight

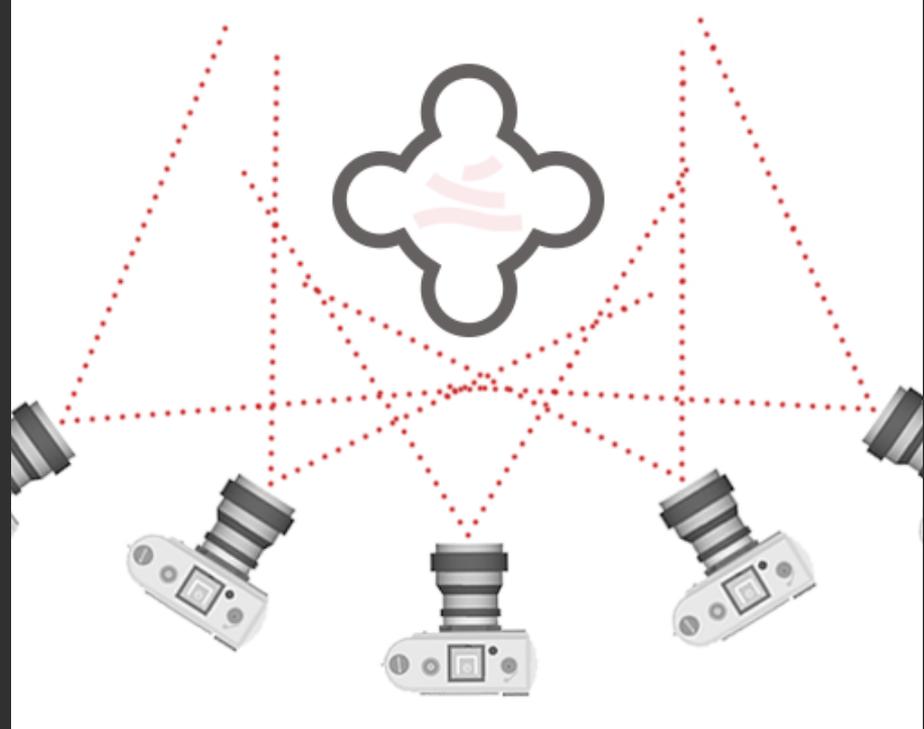


CT Computerized tomography

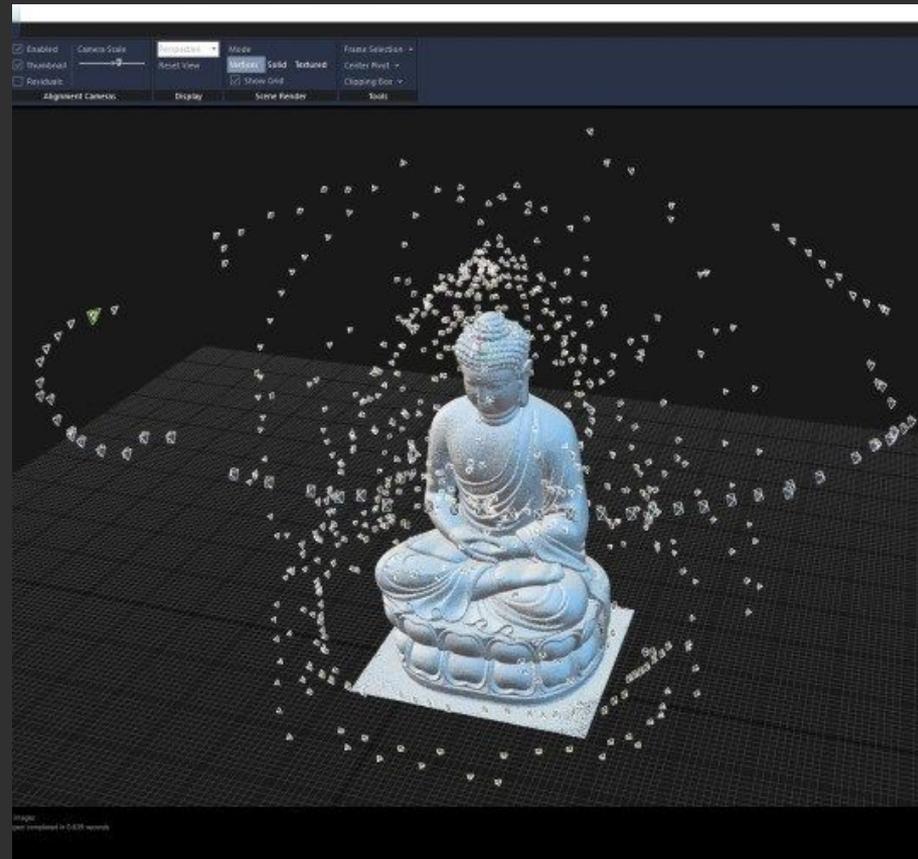


Photogrammetry workflow

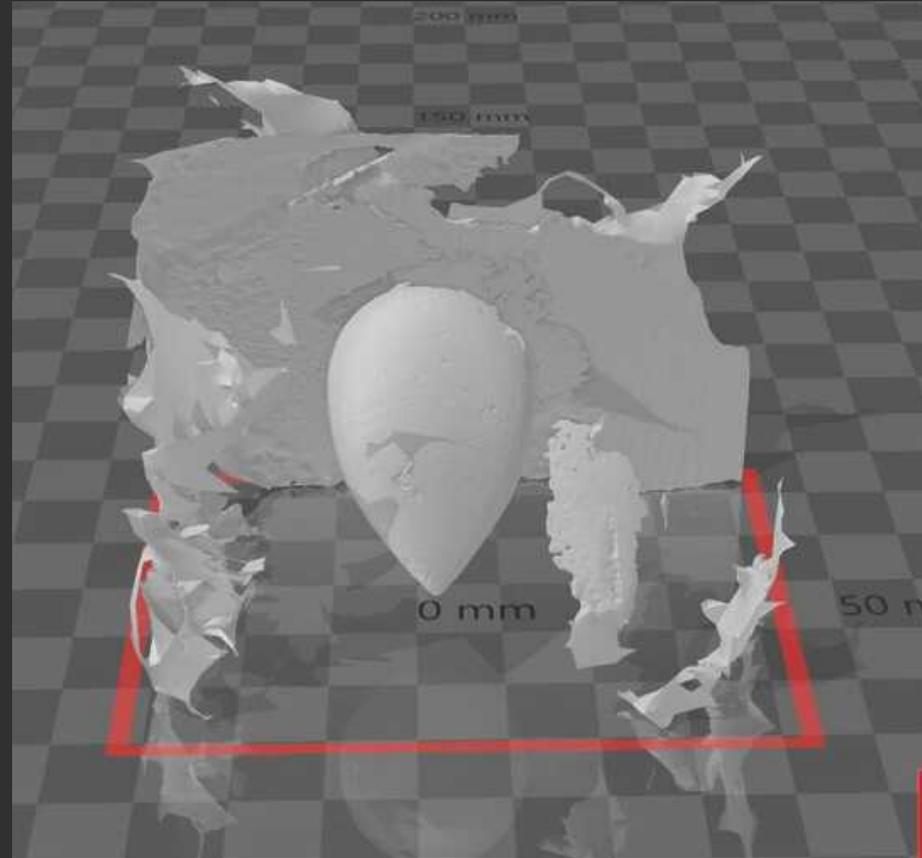
Acquired
images



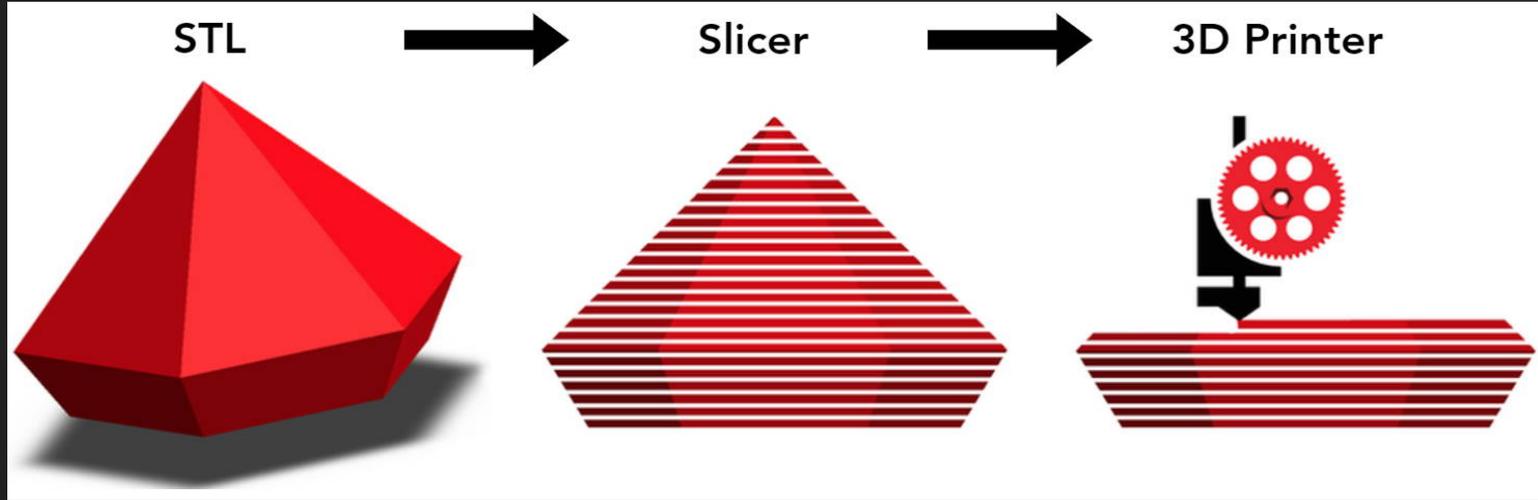
Reconstruction



Cleaning/Adding /Scaling



Slicing/Printing



Preparing a model for print

Each model is unic!

The **shape**, **orientation** and **function** of the model are very important factors.

When using FDM types of printers we are in a constant fight with gravity, we try to avoid the need for supports and we also want to produce, in as little time as possible!

It is good practice to find a good **flat** (if possible) face to not only **start** but also **carry the model** during the entire print. Take in consideration how the machine **works** (mechanics), its movements and the fact that we are **adding weights** to the platform as we are adding material...

It may sound obvious at first for simple models but organic shapes can quickly complicate the task. Find a good **balance** between areas with **supports**, the **quality** and the **time** of print.

Depending on its **function**, we may only need a strong part and the esthetic in this case would not be the priority. Knowing how to **control the settings** available and how they **affect the model** as well as **other settings**, could take time. Be **curious** and try to exploit the parameters to your own **needs** by **learning** what they do!

To Support or not support?

Avoiding support is Avoiding support is "the" permanent battle when slicing a model, learning the capability of our tool is the best way to start. Producing a series of quick test files can help determine how well the printer will deal with overhangs (angle) or bridges. It will also save time and material down the line.

Another way to avoid supports could be to cut the model in smaller and more manageable parts but this would also add design and post processing time.

Ultimately designing the model as well as its own supports, is a great skill to have. Understanding the purpose of this design and how it is going to be made and used plays a big role in this process.

It is easier to fail small tests and learn from them, learn how to anticipate and fail faster.

- IO1 – Methodology for defining 3D printing exercises suitable for transversal education: <https://www.e3dplusvet.eu/wp-content/docs/O1A5-EN.pdf>
- Understanding 3D prints through touch: <http://printdisability.org/about-us/accessible-graphics/3d-printing/touch/>
- Best Photogrammetry Software in 2021 (Some are Free): <https://m.all3dp.com/1/best-photogrammetry-software/#section-free-photogrammetry-software>
- Photogrammetry software review: <https://www.sculpteo.com/en/3d-learning-hub/3d-printing-software/photogrammetry-software/>
- Lithophane maker online: <https://3dp.rocks/lithophane/>
- Lithophane maker online: <https://tool.itslitho.com/CreateModel>
- Lithophane maker online: <https://lithophanemaker.com/index.html>
- Scan the world 3d museum models: <https://www.myminifactory.com/scantheworld/>
- ZBrush: <https://pixologic.com/>
- Autodesk Memento tutorial: <https://www.instructables.com/How-to-Use-Autodesk-Memento-for-Conservation-and-R/>
- Autodesk 123D catch: <https://www.autodesk.com/solutions/123d-apps>
- Shooting for photogrammetry information: <https://www.instructables.com/Shooting-for-Photogrammetry/>

