UNIVERSIDAD DEL QUINDÍO

Diseño e impresión en 3D

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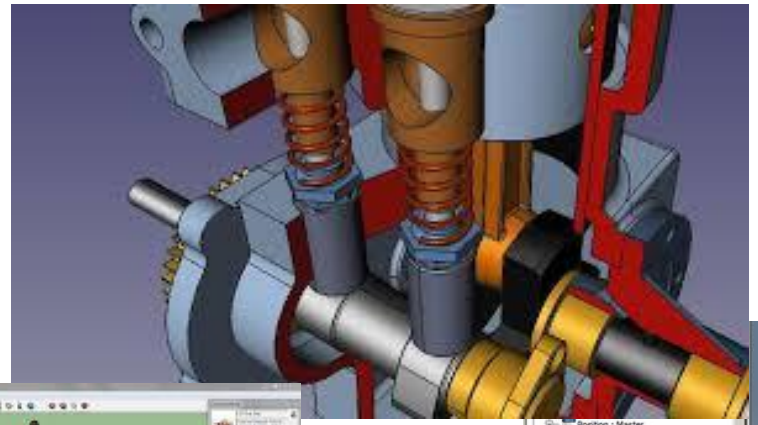
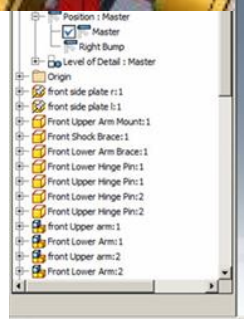
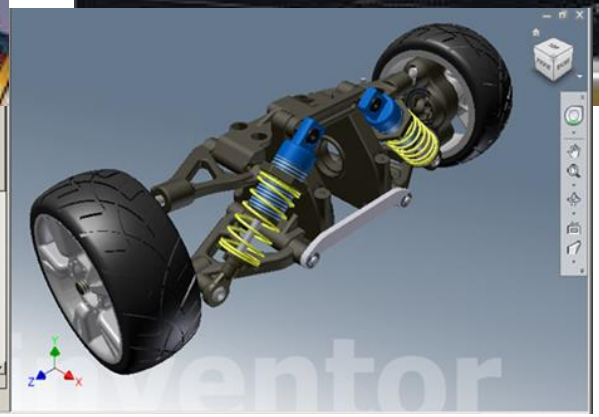
CAD Software

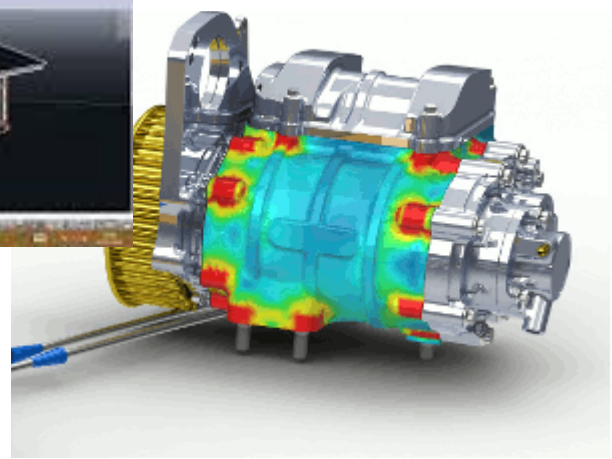
The CAD softwares are used in industries like 3D printing, animation, gaming, architecture, and industrial design, 3D models are crucial components of digital production.



SOLIDWORKS







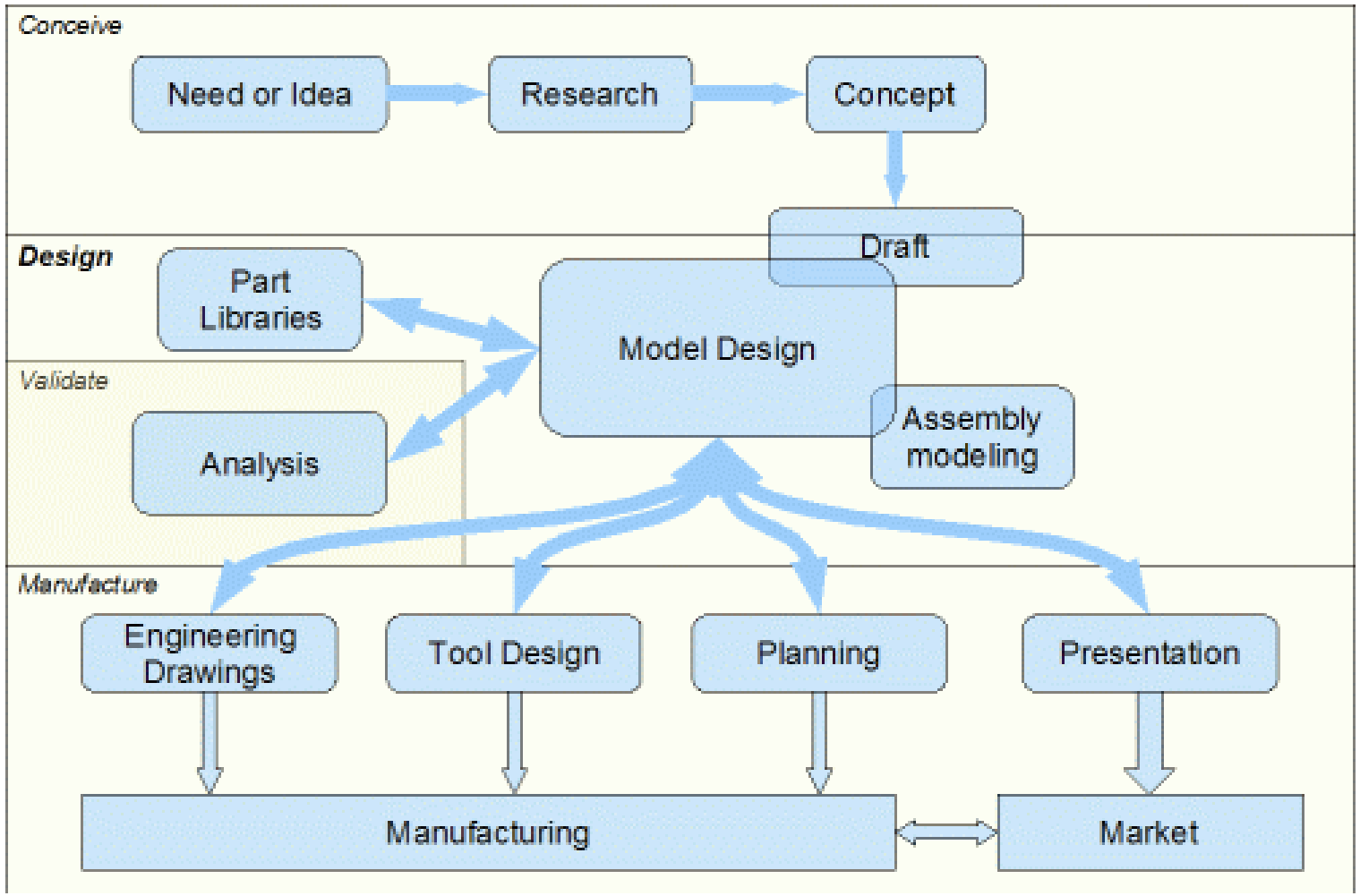
Industries using CAD software

Industry
Machinery
Computer Hardware
Mechanical or Industrial Engineering
Mining & Metals
Higher Education
Medical Devices
Automotive
Construction
Computer Software
Aviation & Aerospace

Importancia del diseño CAD

- Improves ingeneer productivity.
- Facilitates the customer requirements.
- Minimize transcription errors.
- Improves design presicion.
- Component’s interactions can be analized.
- Reduce prototype testing.
- Design standarization.
- Better knowledge of costs.
- Manufacture oriented design.
- Construction blueprints can be easily obtained.

CAD based design process



https://en.wikiversity.org/wiki/Computer-aided_design/Principles_and_terminology#/media/File:CAD_Lesson_Principles_CAD_Scheme.gif

FreeCad

FreeCAD

Open Source parametric 3D CAD modeler

- FreeCAD is a parametric 3D modeler made primarily to design real-life objects of any size. Parametric modeling allows you to easily modify your design by going back into your model history and changing its parameters. FreeCAD is open-source and highly customizable, scriptable and extensible.

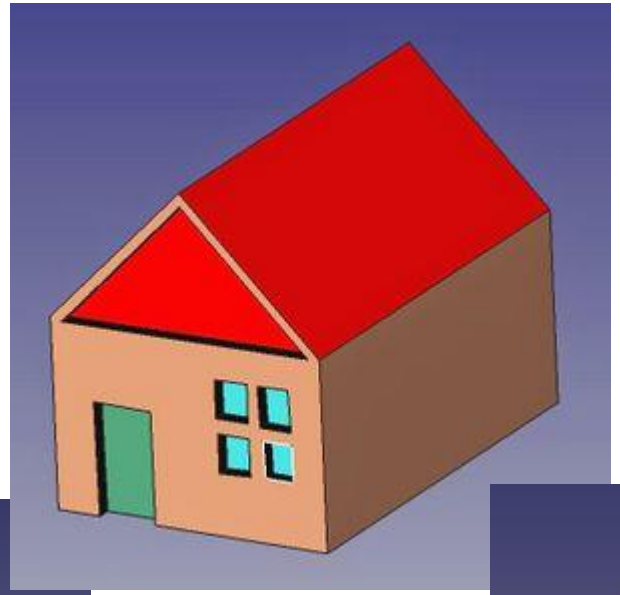
- FreeCAD is multiplatfom (Windows, Mac and Linux), and reads and writes many open file formats.

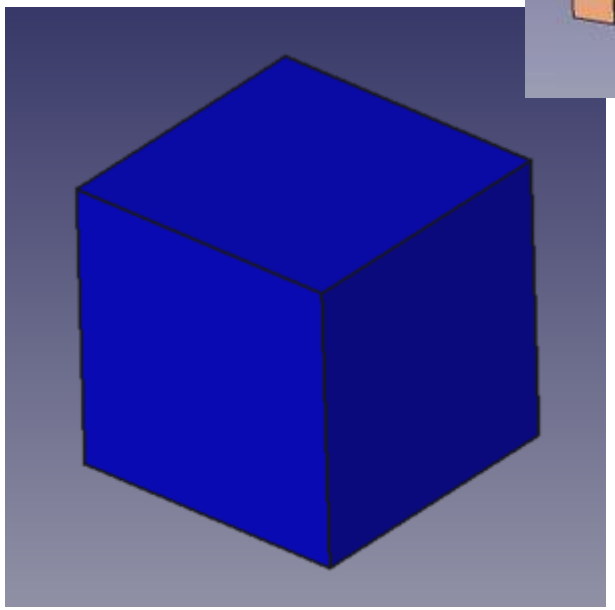
- A free software with no worry about license purchase.

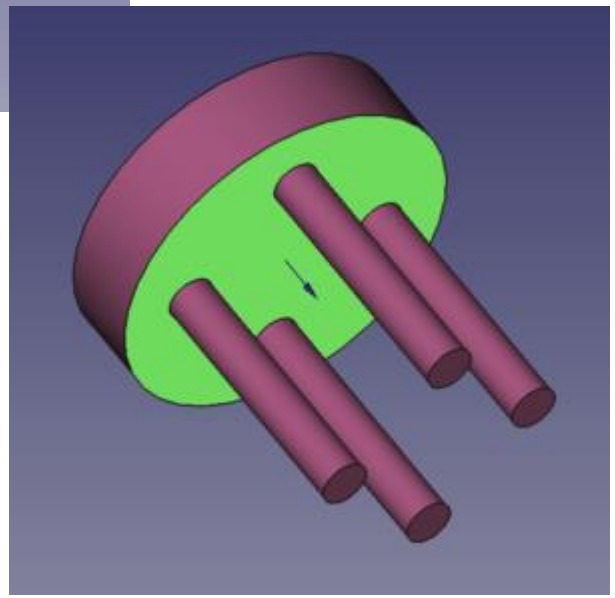
Freecad basic topics

- Workspaces
- Basic shapes
- Join objects
- Boolean actions
- Arrays
- Rounding edges

- Extruding







Add-ons repository for FreeCAD

his repository is a collection of useful additional workbenches and modules for FreeCAD made by community members, gathered here for your convenience.

Since these are not part of the official FreeCAD package and not supported by the FreeCAD team, you should read the information provided on each of the addons page

Instalación:
https://github.com/FreeCAD/FreeCAD-addons

The FreeCAD Library

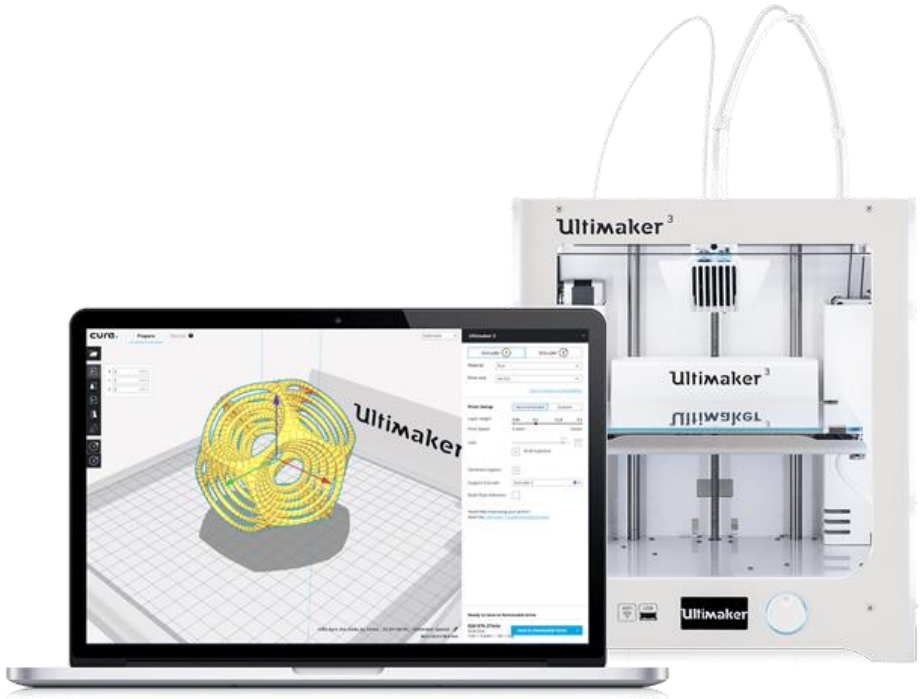
This repository contains a library of Parts to be used in FreeCAD. It is maintained by the community of users of FreeCAD and is not part of the FreeCAD project, although it is made with the aim to be used as a repository of parts by FreeCAD in the future.

It contains several pieces of diferent categories, as furniture, building construction, electrical parts, electronic components, mechanical parts, among others.

It can be installed as an ADD-ON or simply downloaded.

Ultimaker - Cura

Ultimaker Cura prepares your model for 3D printing. For novices, it makes it easy to get great results. For experts, there are over 200 settings to adjust to your needs. And integration with major software platforms makes 3D printing even simpler.

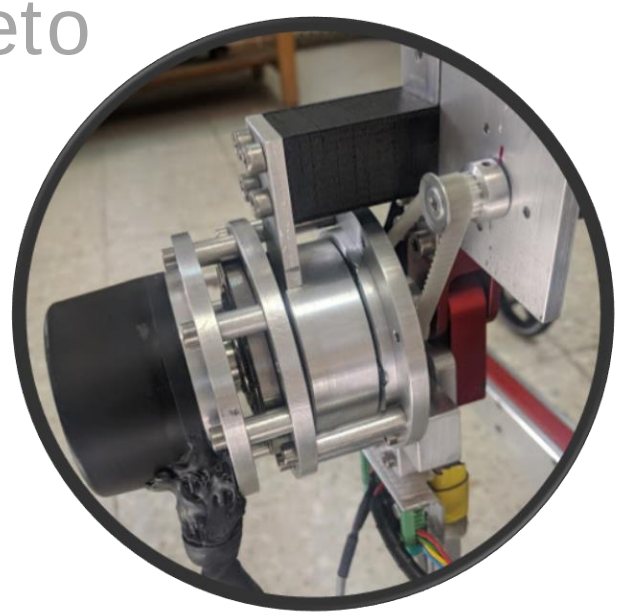


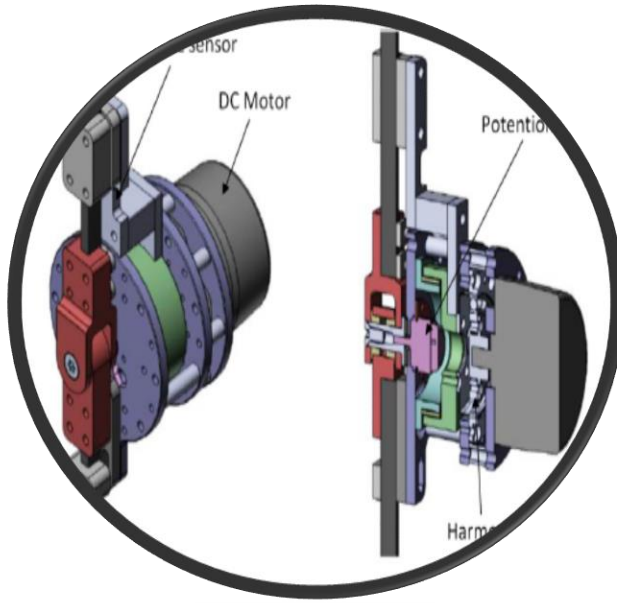
Anycubic i3 mega

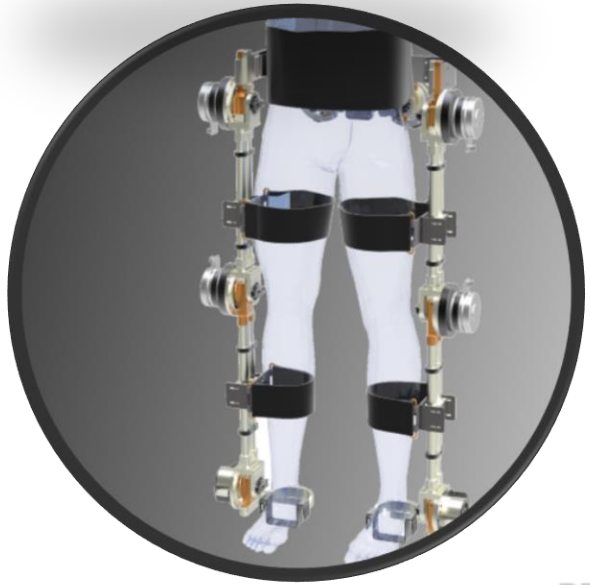
- Adopt any cubic ultrabase platform, removing the printed objects easier than other 3D printers.
- Extremely simple assembly, more stable performance
- No need for the firmware and debugging, easy prints after assembled
- All metal frame for rigidity and extending service life
- Double Z axis double drive, more powerful
- One-piece screw motor installation more convenient, excellence in parallel trapezoidal screw motor, the error is smaller, higher accuracy, more convenient installation
- 1.8 degree precision stepping motor driver chip has independent, refused to lose step

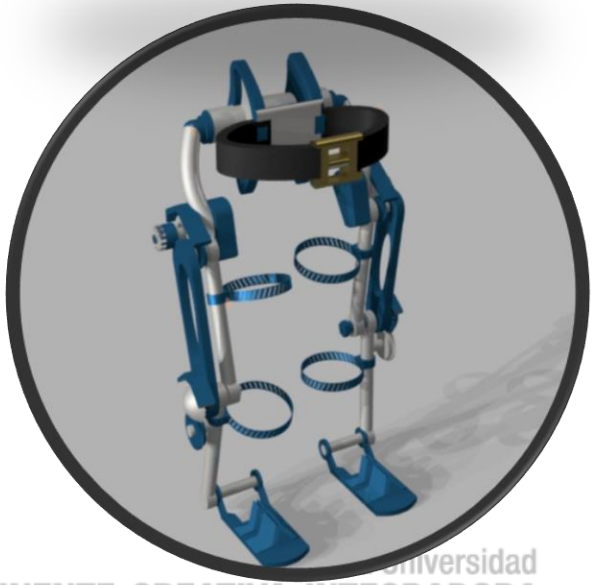
Estructura de un exoesquelet

- La mayoría de los exoesquelletos sencillos cuentan con 2 o 3 DOF en cada pierna.
- Algunos pueden llegar a tener 4 o incluso 5 DOF.
- En su mayoría utilizan motores DC con alguna caja de reducción.









Requerimientos de diseño

Los requerimientos definidos para la estructura del exoesqueleto son:

- Altura de 25 cm
- Proporciones antropomórficas
- Fácil acople al Smart Walker
- Uso de servos de tamaño estándar
- 2 DOF por pierna
- Capacidad mecánica de tener una persona en su interior
- Soporte extra en las articulaciones

Componentes principales a diseñar

- Articulación de la cadera
- Articulación de la rodilla
- Unión entre las piernas/acople con el Smart Walker
- Bandas de agarre del paciente

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Por una Universidad
PERTINENTE CREATIVA INTEGRADORA

CALIDAD QUE NOS CONECTA

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