

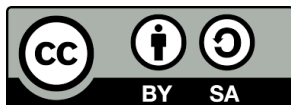


Tools and Applications for 3D Data Processing

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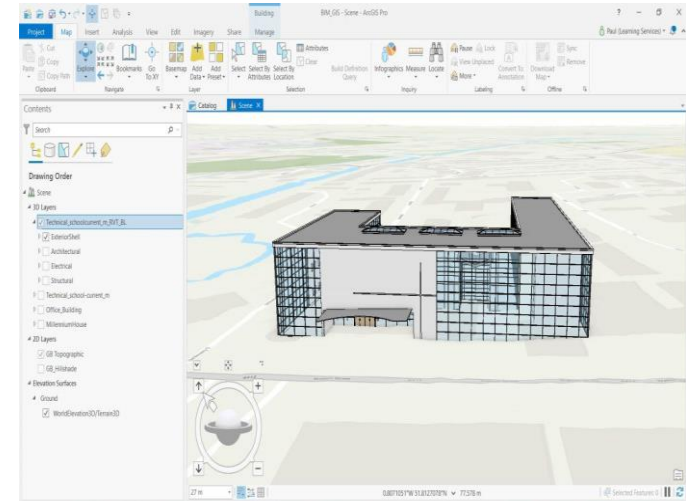
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Learning outcomes

- At the end of this module, the participant is expected to be able to
 - Describe and choose different tools and applications for 3D data processing





- **CAD, BIM and GIS**
- CAD (computer-aided design) is the use of computer-based software to aid in design processes. CAD software can be used to create 2D or 3D drawings
- BIM software offers a model-based process for designing and managing buildings and infrastructures, advancing construction drawings to generate a digital representation of the functional properties of a facility
- GIS software is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface

	BIM (CAD)	GIS
Goal	digital representation used for design, construction and management of assets	captures, stores, analyzes, manages and presents data linked to location.
Detail	physical and functional detail (composition); detailed geometry	Spatial context: geometric, topologic features (no geometrical detail)
Scope	represent non-existing objects	spatial object representation
Spatial analysis	no spatial analysis	spatial analysis
Users	single user	multiple users in one dataset (Enterprise Geodatabases)
Data types	single drawing files (2D or 3D)	maps combine multiple feature sets (streets, buildings, topography) together; many types of data (photos, videos, databases, sound clips)
Software	Autodesk Revit, Navisworks, Tekla, Relatics	ArcGIS Desktop, Server, web viewers and services (Obsurv)
Standards	IFC, STEP	OGC WMS, WFS, GML, CityGML

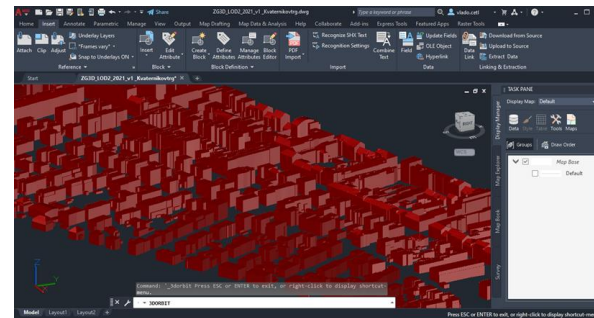
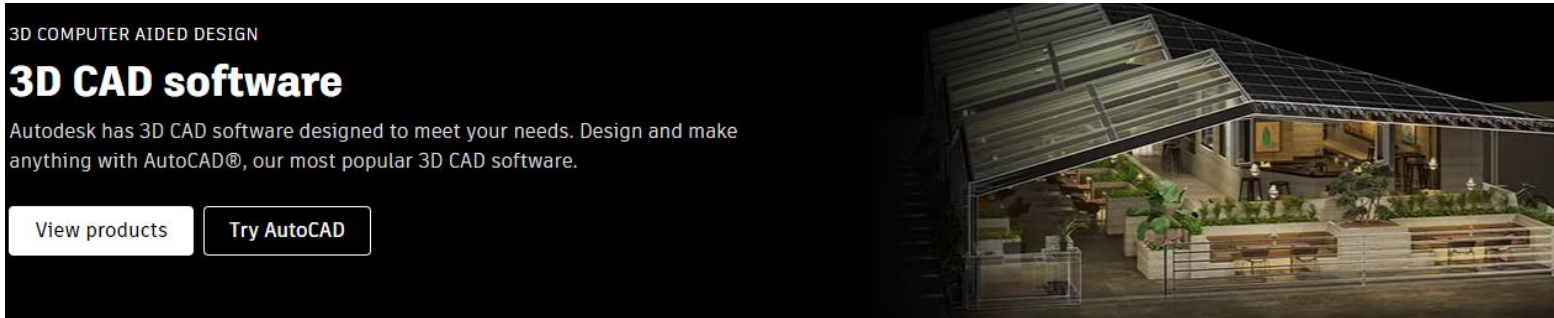
- Commercial vs. Free and Open Source

COMPARISON OF OPEN SOURCE AND PROPRIETARY SOFTWARE

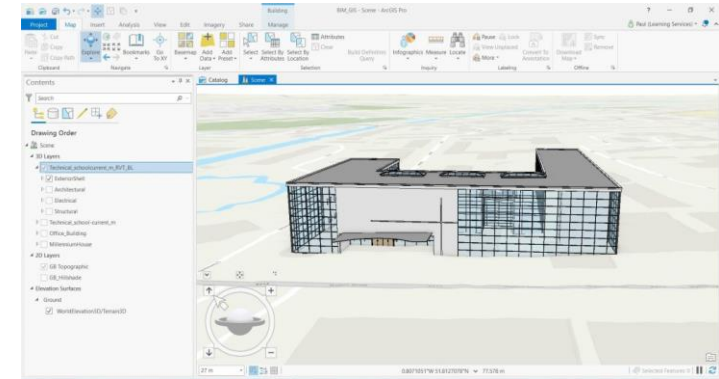
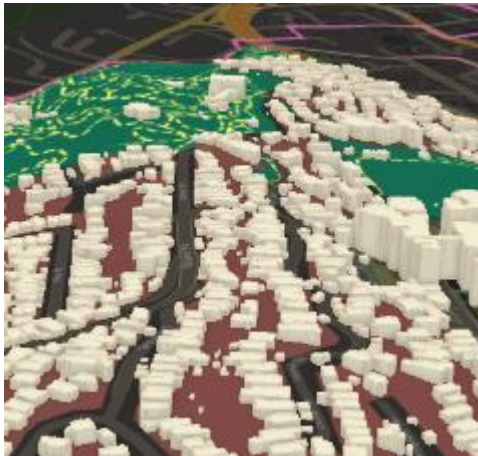
	proprietary software	open source software
license fee		
maintenance and support	commercial support	community or commercial support, if available
source code access	no access	access, modification possible

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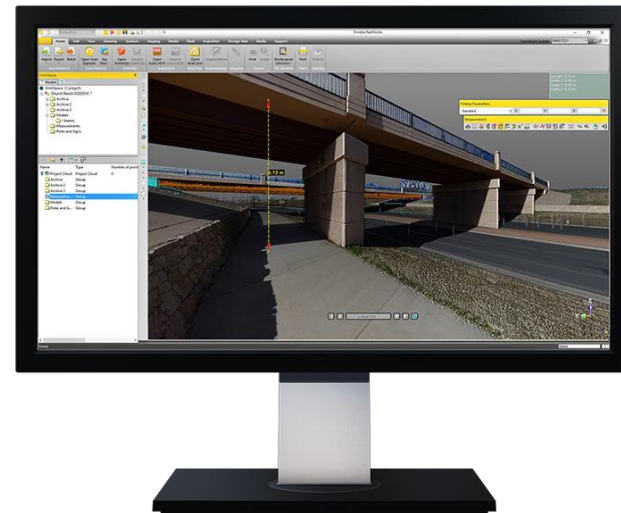
- Commercial
 - Autodesk 3D CAD software



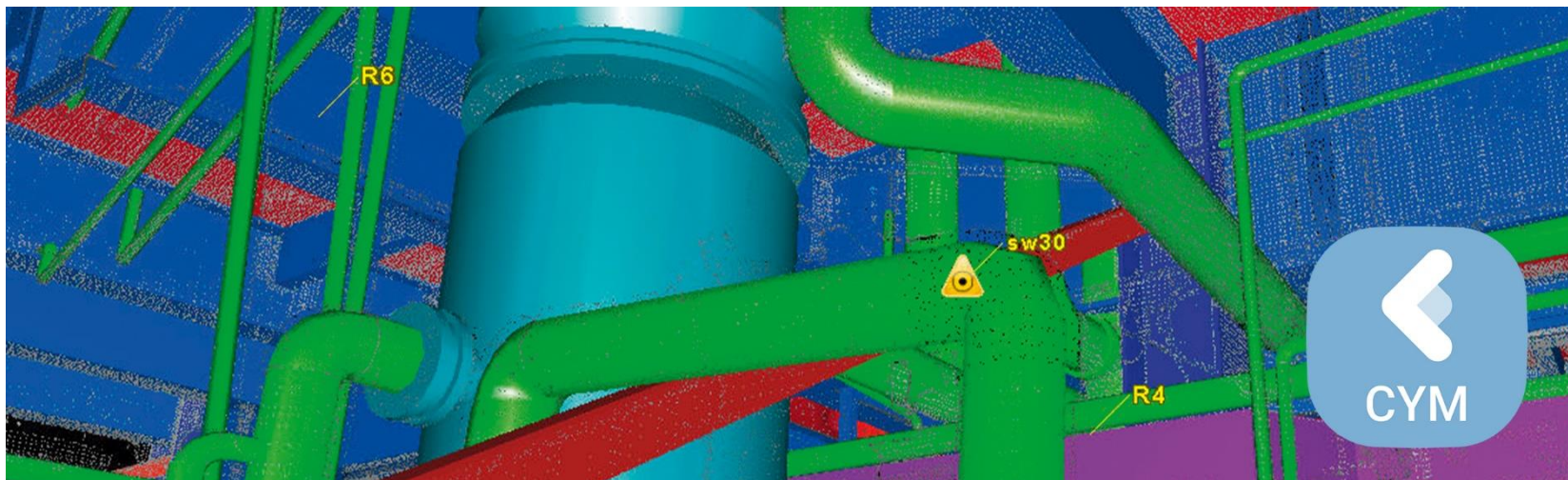
- **Commercial**
 - [ESRI ArcGIS Pro](#) allows to explore, analyze, and symbolize data in 3D
 - It also reads building information modeling (BIM) files as an ArcGIS workspace of feature classes called a BIM file workspace



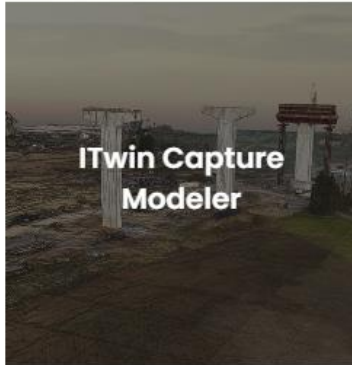
- Commercial
 - Trimble RealWorks:
 - Import point cloud data from virtually any source, then quickly process, analyze and create high-quality deliverables with Trimble RealWorks software's automated tools and point cloud-specific workflows.



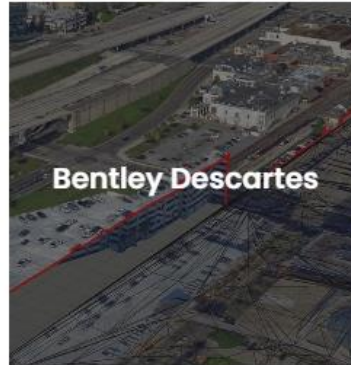
- Commercial
 - [Leica Cyclone MODEL](#)
 - Standalone 3D modelling software for analysing & converting rich, laser scan data



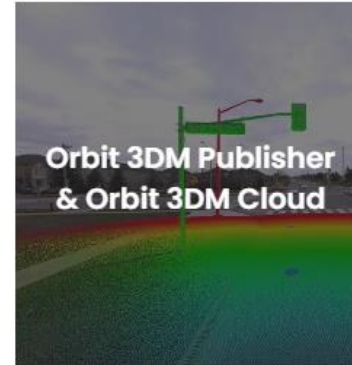
- Commercial
 - [Bentley](#)



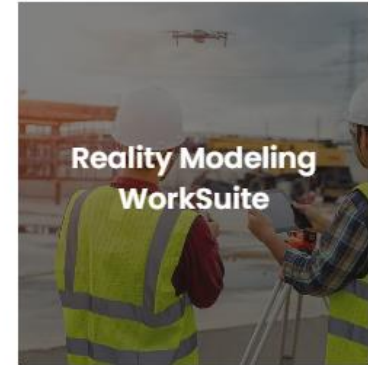
iTwIn Capture Modeler enables you to automatically generate multiresolution 3D models at any scale and precision.



Extract data and integrate point clouds, reality meshes, scalable terrain models, and raster imagery into your workflows.

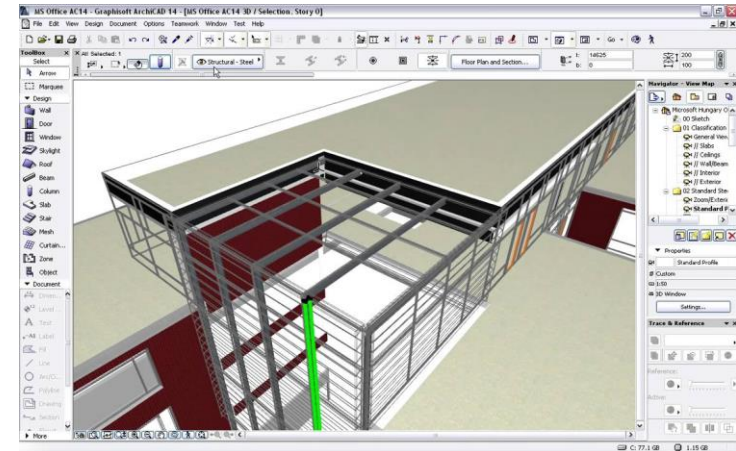


Share unlimited volumes of planar/panoramic imageries, meshes and point clouds of your mobile, oblique, indoor, UAS, or terrestrial mapping data.



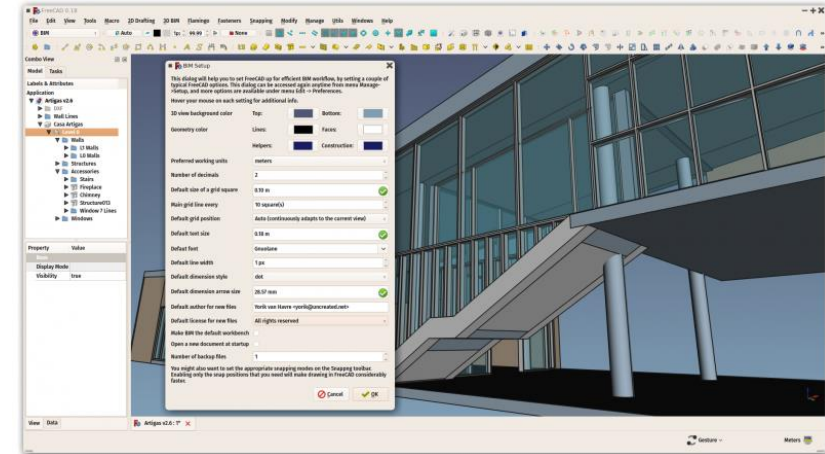
Access Bentley's most popular reality modeling applications iTwin Capture Modeler and Reality Data Management, in one bundle.

- **Commercial**
 - [Graphisoft ARCHICAD](#) is software used widely by architects, designers, engineers, and urban planners for a comprehensive project's design
 - ARCHICAD's user interface is functional and straightforward, making it one of the more accessible BIM software to pick up for beginners
 - ARCHICAD can render 3D models of anything from an office park landscaping project to entire college campuses

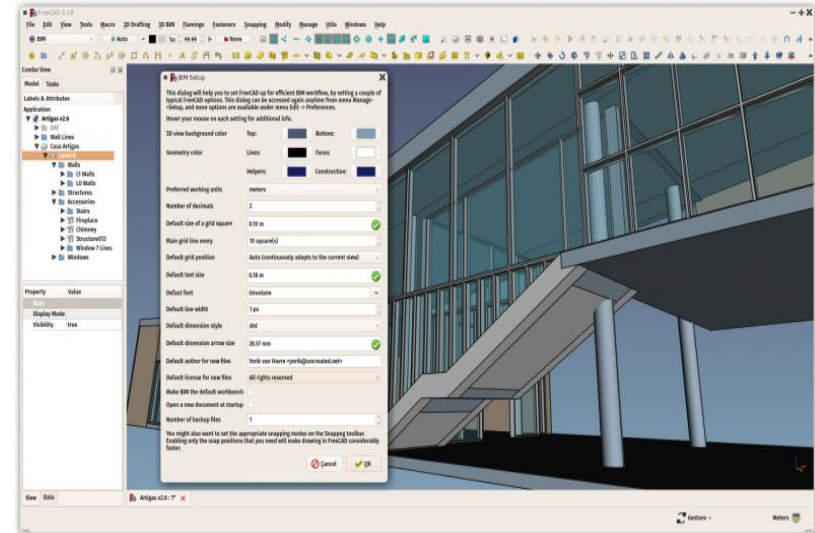


- **Free and Open Source**

- [FreeCAD](#) - parametric 3D modeler made primarily to design real-life objects of any size
- It is designed to fit a wide range of uses including product design, mechanical engineering and architecture
- The [BIM Workbench](#) BIM.svg is an external workbench aimed at implementing complete BIM tools and workflow in FreeCAD
- It can be installed from the Addon Manager.



- **Free and Open Source**
 - [QGIS](#) - A Free and Open Source Geographic Information System
 - QGIS allows users to create, edit, visualize, analyse, and publish geospatial information
 - Not a BIM software
 - Data exchange is possible



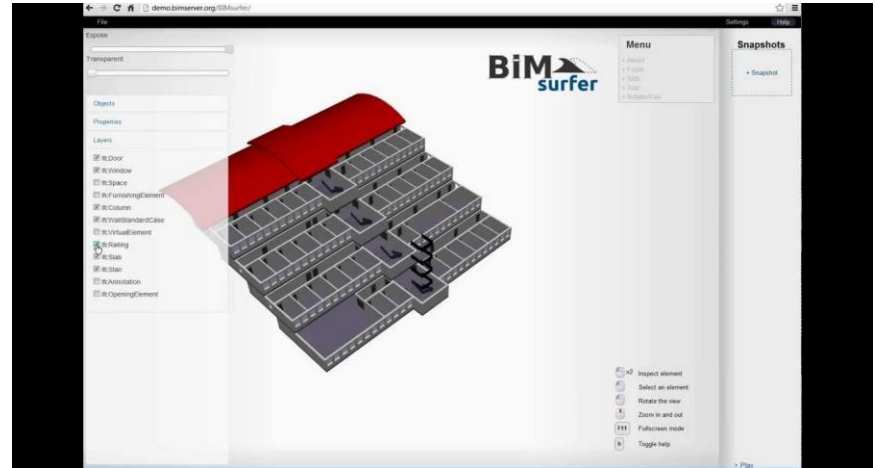
- Free and Open Source
 - [Open3D](#)

Open3D

A Modern Library for 3D Data Processing



- **Free and Open Source**
 - [BIMvision](https://bimvision.org) - is a freeware IFC model viewer
 - It allows to view the virtual models coming from CAD systems like Revit, Archicad, Bentley etc.
 - IFC edit plugin



Some logo's and links to web site and social media here

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