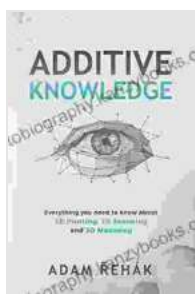


# Everything You Need to Know About 3D Printing, 3D Scanning, and 3D Modeling

3D printing, 3D scanning, and 3D modeling are three rapidly growing technologies that are revolutionizing the way we design, manufacture, and interact with the world around us. These technologies have a wide range of applications, from prototyping and manufacturing to healthcare and education.



## Additive Knowledge: Everything you need to know about 3D Printing, 3D Scanning and 3D Modeling

by Adam Řehák

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## 3D Printing

3D printing, also known as additive manufacturing, is a process of creating a three-dimensional object from a digital file. The process starts with a 3D model, which is a computer-aided design (CAD) file that describes the object's shape and dimensions. The 3D model is then sliced into thin

layers, and a 3D printer builds the object by depositing material layer by layer until the object is complete.

There are many different types of 3D printers, each with its own advantages and disadvantages. The most common type of 3D printer is the fused deposition modeling (FDM) printer, which uses a heated nozzle to melt and deposit plastic filament layer by layer. Other types of 3D printers include stereolithography (SLA) printers, which use a laser to cure liquid resin, and selective laser sintering (SLS) printers, which use a laser to fuse powder particles together.

3D printing has a wide range of applications, including:

- **Prototyping:** 3D printing can be used to quickly and easily create prototypes of new products, allowing designers to test and refine their designs before committing to expensive tooling and manufacturing.
- **Manufacturing:** 3D printing can be used to manufacture small batches of parts or products, or to create custom parts that are not available through traditional manufacturing methods.
- **Healthcare:** 3D printing can be used to create custom prosthetics, implants, and other medical devices, which can be tailored to the specific needs of each patient.
- **Education:** 3D printing can be used to create teaching models, which can help students to visualize complex concepts.

### **3D Scanning**

3D scanning is a process of capturing the shape and dimensions of a physical object and creating a digital 3D model. The process starts with a

3D scanner, which is a device that emits a beam of light or other radiation and measures the way that the beam interacts with the object. The 3D scanner then uses this information to create a point cloud, which is a collection of points that represent the surface of the object.

There are many different types of 3D scanners, each with its own advantages and disadvantages. The most common type of 3D scanner is the structured light scanner, which uses a projector to project a pattern of light onto the object and a camera to capture the way that the light is reflected. Other types of 3D scanners include laser scanners, which use a laser to measure the distance between the scanner and the object, and photogrammetry scanners, which use multiple photographs of the object to create a 3D model.

3D scanning has a wide range of applications, including:

- Reverse engineering: 3D scanning can be used to create a digital model of an existing physical object, which can then be used to create new parts or products.
- Quality control: 3D scanning can be used to inspect parts and products for defects and to ensure that they meet specifications.
- Healthcare: 3D scanning can be used to create custom prosthetics, implants, and other medical devices, which can be tailored to the specific needs of each patient.
- Education: 3D scanning can be used to create teaching models, which can help students to visualize complex concepts.

## **3D Modeling**

3D modeling is the process of creating a three-dimensional representation of an object using computer software. 3D models can be created from scratch, or they can be created by scanning a physical object or by importing a 2D image. Once a 3D model has been created, it can be used for a variety of purposes, such as visualization, animation, and 3D printing.

There are many different types of 3D modeling software, each with its own strengths and weaknesses. Some of the most popular 3D modeling software programs include:

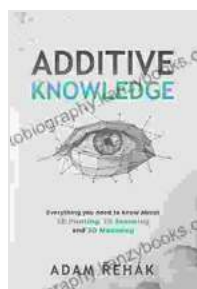
- Autodesk Maya: Maya is a professional-grade 3D modeling software program that is used by visual effects artists, game developers, and product designers.
- Blender: Blender is a free and open-source 3D modeling software program that is popular among hobbyists and independent artists.
- Cinema 4D: Cinema 4D is a commercial 3D modeling software program that is used by motion graphics artists, video editors, and architects.
- SolidWorks: SolidWorks is a commercial 3D modeling software program that is used by mechanical engineers and product designers.

3D modeling has a wide range of applications, including:

- Visualization: 3D models can be used to create realistic and immersive visualizations of objects and environments.
- Animation: 3D models can be used to create animated characters and objects for films, television shows, and video games.

- 3D printing: 3D models can be used to create 3D printed objects, which can be used for prototyping, manufacturing, and custom products.
- Product design: 3D models can be used to design and visualize products before they are manufactured.

3D printing, 3D scanning, and 3D modeling are three rapidly growing technologies that are having a major impact on a wide range of industries. These technologies are making it possible to create complex and customized objects quickly and easily, which is opening up new possibilities for innovation and creativity.



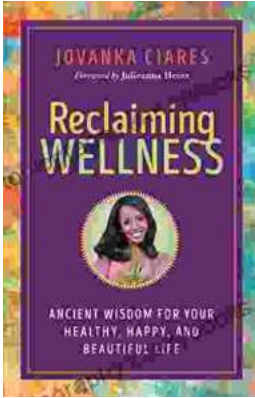
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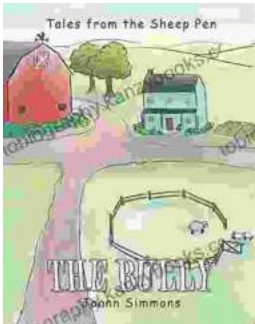
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