

Basics of Computer Graphics

Part I: Introduction

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What is Computer Graphics?

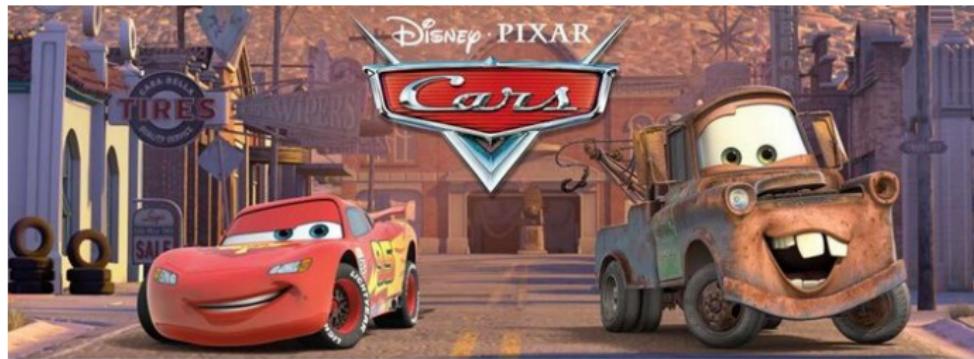
- ▶ Computer graphics is the field of computer science that deals with the creation, manipulation, and display of digital images.
- ▶ It incorporates the algorithmic and mathematical tools that can be used to create all kinds of images
- ▶ It is used in a wide variety of applications, including video games, movies, and animation, engineering and scientific visualization, medical imaging, graphic design, and printing.

Advantages of Computer Graphics

- ▶ Realism: Computer graphics can be used to create very realistic images, which can be useful for simulating the real world in video games and movies.
- ▶ Creativity: Computer graphics gives artists the freedom to create images that would be impossible to create with traditional methods.
- ▶ Efficiency: Computer graphics can be used to create images quickly and efficiently, which is important for applications such as video games and movies.
- ▶ Accuracy: Computer graphics can be used to create very accurate images, which is important for applications such as engineering and medical imaging.

Applications of Computer Graphics

- **Entertainment:** Computer graphics is used to create the special effects and animations in movies, TV shows, and video games. It is also used to create realistic 3D models for use in virtual reality and augmented reality applications.



Applications of Computer Graphics

- **Design:** Computer graphics is used in design fields such as architecture, engineering, and product design to create 3D models and simulations. This allows designers to visualize and test their designs before they are built.



Applications of Computer Graphics

- ▶ **Science and medicine:** Computer graphics is used in science and medicine to visualize and analyze data. For example, it is used to create images of molecules and cells, and to simulate the behavior of fluids and gases.



Figure: Computer Graphics in Medicine

Applications of Computer Graphics

- ▶ **Education:** Computer graphics is used in education to create interactive learning materials and simulations. This can help students to learn more effectively and to visualize complex concepts.

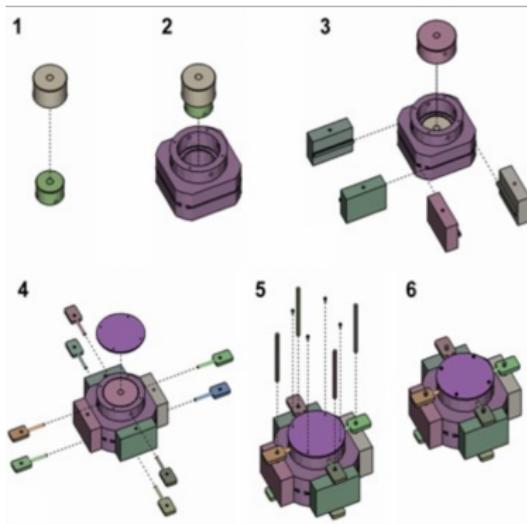


Figure: Computer Graphics in Education and Training

Next Sections of Chapter 1:

- ▶ Basics of Computer Graphics
- ▶ Various Display Devices
- ▶ Raster Graphics System
- ▶ Random Graphics System
- ▶ Input Devices
- ▶ Graphics Software and Standard

References

- ▶ Donald Hearn, M. Pauline Barker, 2nd Edition Computer Graphics, C Version.
- ▶ Fundamentals of Computer Graphics by Peter Shirley.