COMPUTER GRAPHICS

01

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Lecture 1

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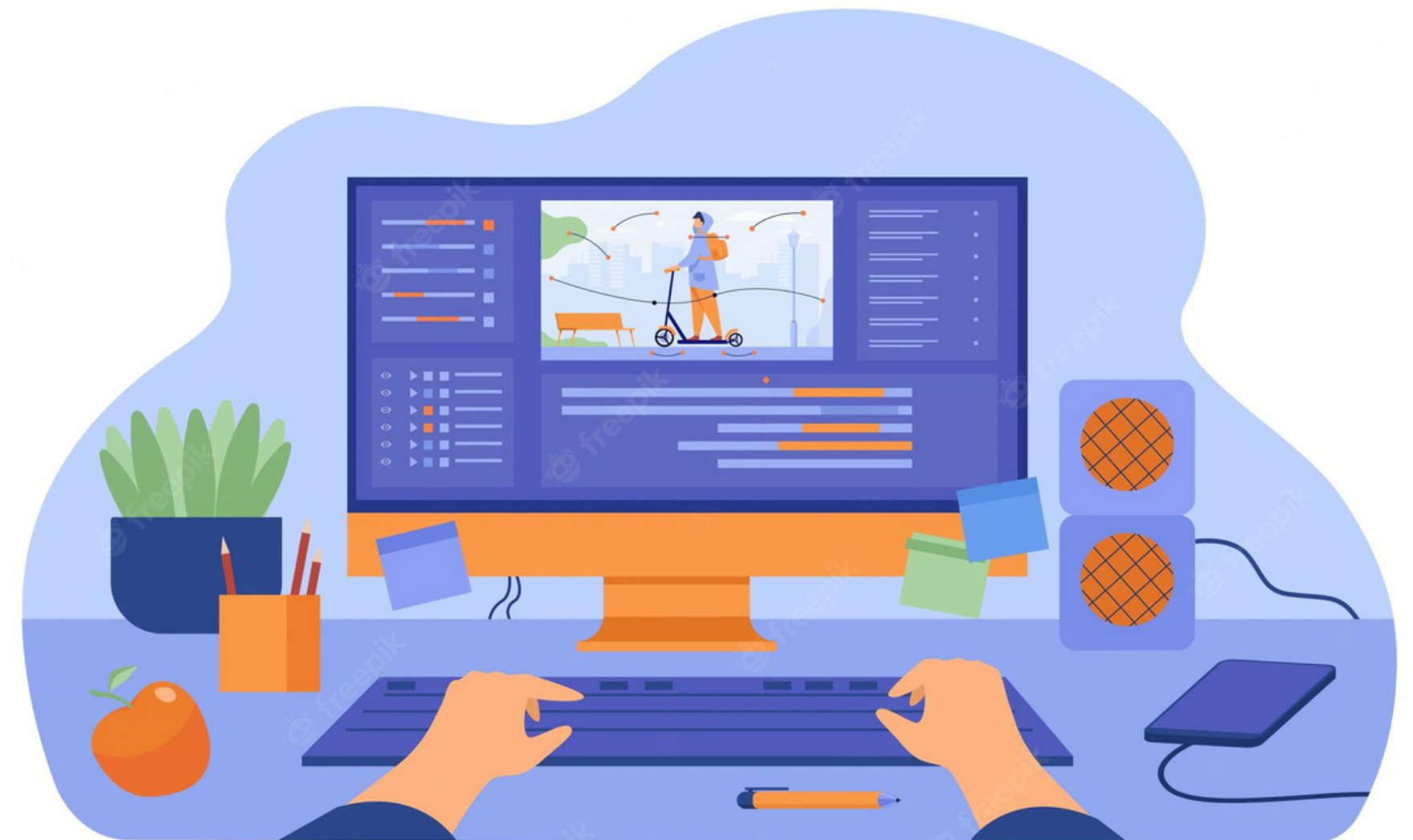Visualization
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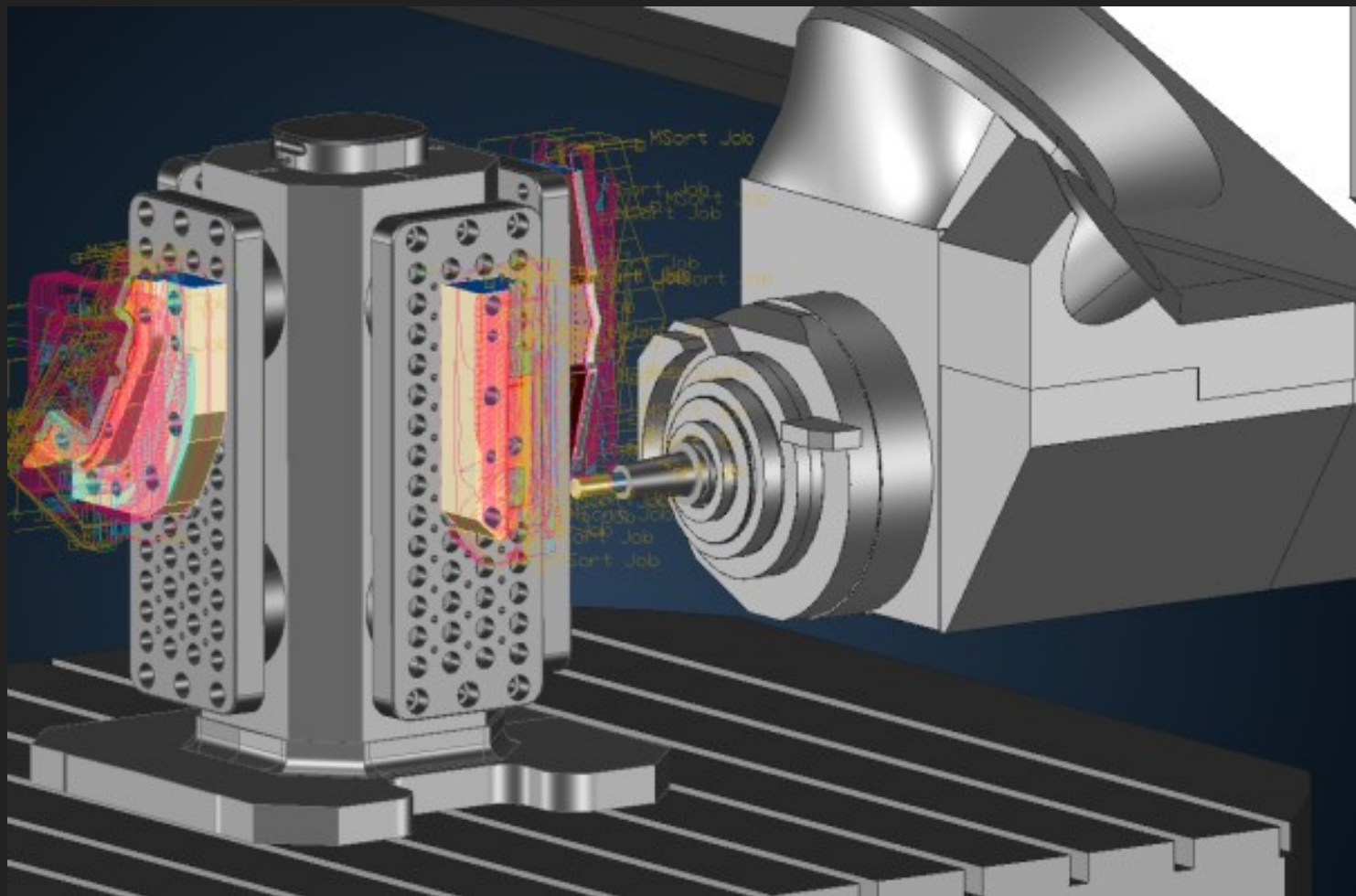
What is **Computer Graphics?**

Definition

Computer Graphics is the use of computers to display and manipulate information in graphical or pictorial form, either on a visual-display unit or via a printer or plotter.
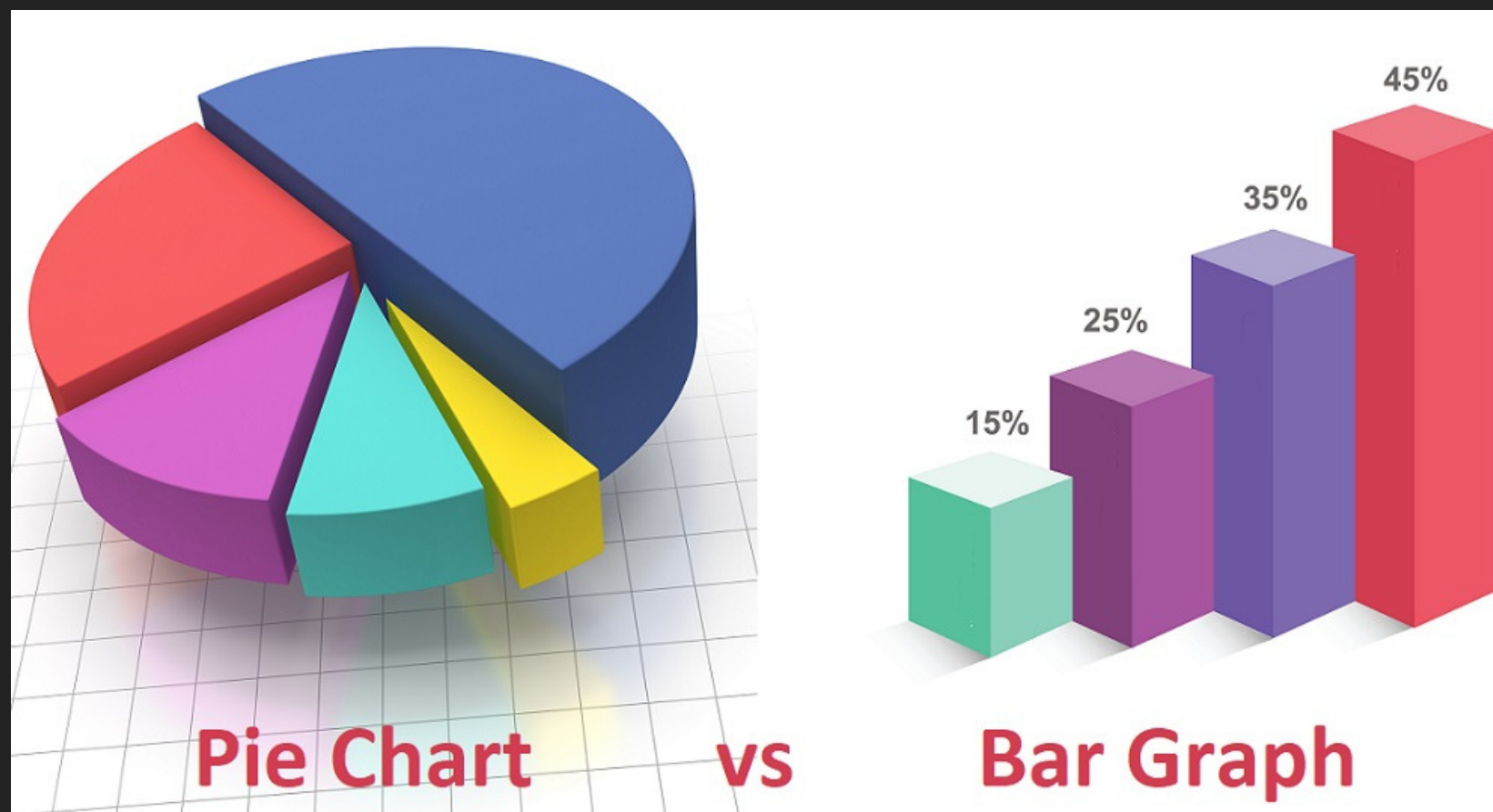
Computer Graphics
Applications

Computer Aided Design

- Animations are often used in CAD applications.
- When object designs are complete, realistic lighting models and surface rendering are applied.
- Manufacturing process of object can also be controlled through CAD.
- Three-dimensional interior layouts and lighting also provided.
- With virtual-reality systems, the designers can go for a simulated walk inside the building.

Computer Graphics

Applications

Pie Chart vs **Bar Graph**

Presentation Graphics

- It is used to produce illustrations for reports or to generate slide for with projections.
- Examples of presentation graphics are bar charts, line graphs, surface graphs, pie charts and displays showing relationships between parameters.
- 3-D graphics can provide more attraction to the presentation.

Computer Graphics
Applications

Computer Art

- Computer graphics methods are widely used in both fine art and commercial art applications.
- The artist uses a combination of 3D modeling packages, texture mapping, drawing programs and CAD software.
- "Mathematical Art" can be produced using mathematical functions, fractal procedures.
- Photorealistic techniques are used to render images of a product.
- Animations are also used frequently in advertising, and television commercials are produced frame by frame.

Computer Graphics
Applications

Entertainment

- CG methods are now commonly used in making motion pictures, music videos and television shows.
- Many TV series regularly employ computer graphics method.
- Graphics objects can be combined with a live action.
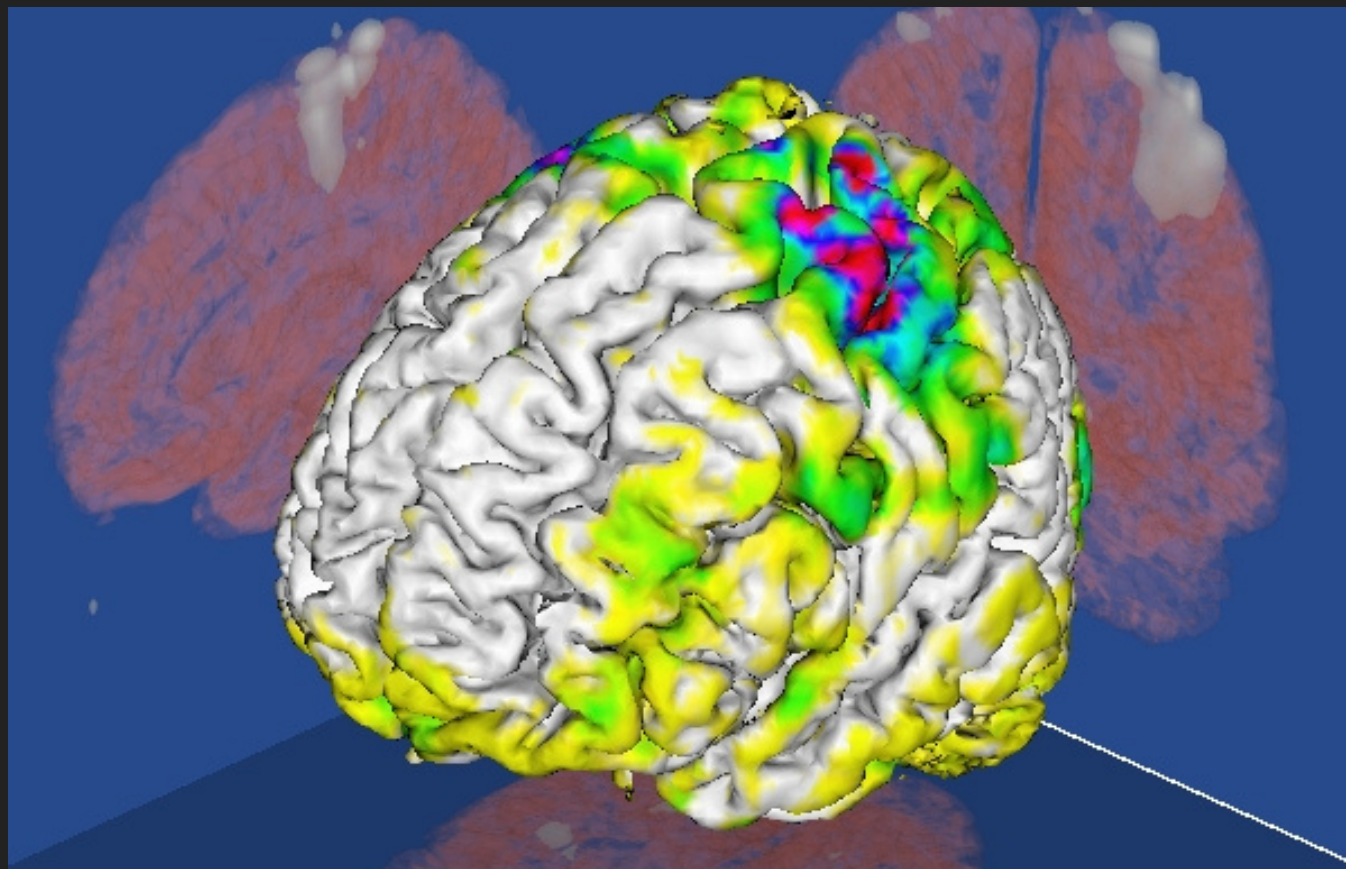
Computer Graphics
Applications

Education and Training

- Computer-generated models of physical, financial and economic systems are often used as educational aids.
- For some training applications, special systems are designed. Eg. Training of ship captains, aircraft pilots etc.,
- Some simulators have no video screens, but most simulators provide graphics screen for visual operation.
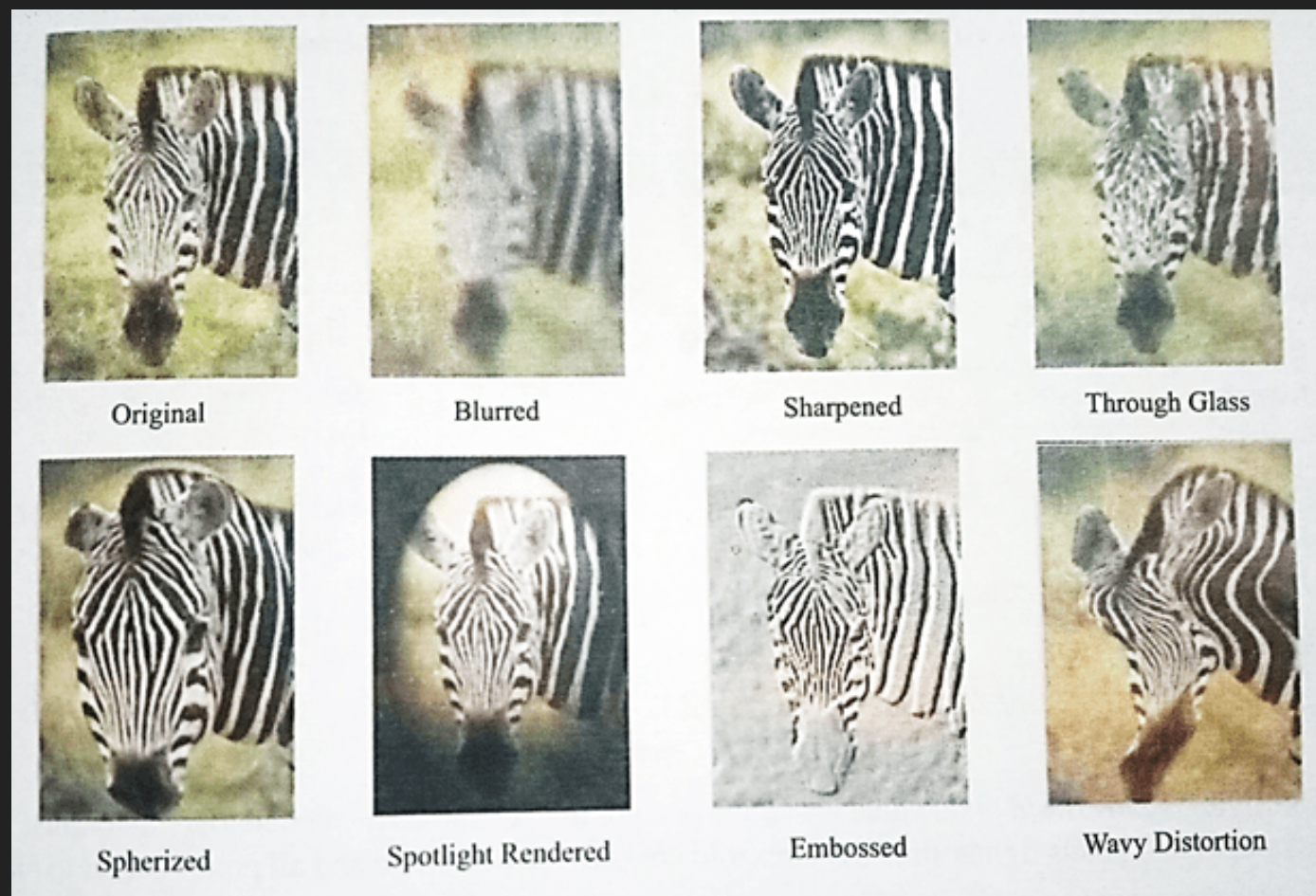
Computer Graphics
Applications

Scientific Visualization

- The numerical and scientific data are converted to a visual form for analysis and to study the behavior called visualization.
- Producing graphical representation for scientific data sets are calls scientific visualization.
- And business visualization is used to represent the data sets related to commerce and industry.
- The visualization can be either 2D or 3D.

Computer Graphics
Applications

Original | Blurred | Sharpened | Through Glass

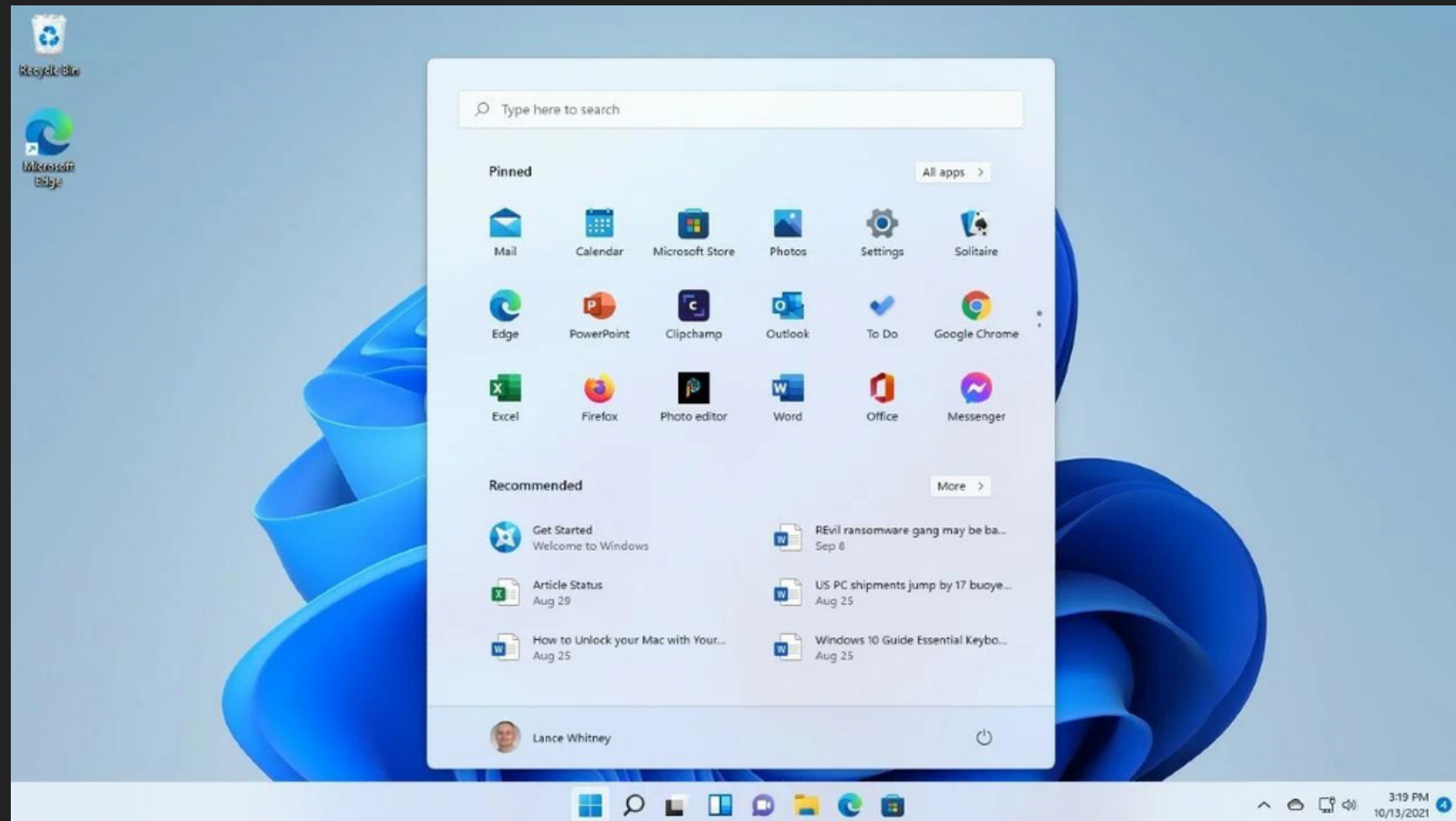Spherized | Spotlight Rendered | Embossed | Wavy Distortion

Image Processing

- Computer graphics is used to create a picture.
- Image processing applies techniques to modify or interpret existing pictures.
- To apply image processing methods, the image must be digitized first.
- Medical applications also make extensive use of image processing techniques for picture enhancements, simulations of operations, etc.

Computer Graphics
Applications

Graphical User Interface

- Nowadays software packages provide graphics user interface (GUI) for the user to work easily.
- A major component in GUI is a window.
- Multiple windows can be opened at a time.
- To activate any one of the window, the user needs just to check on that window.
- Menus and icons are used for fast selection of processing operations.
- Icons are used as shortcut to perform functions. The advantages of icons are which takes less screen space.
- And some other interfaces like text box, buttons, and list are also used.

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Thank You

The End