

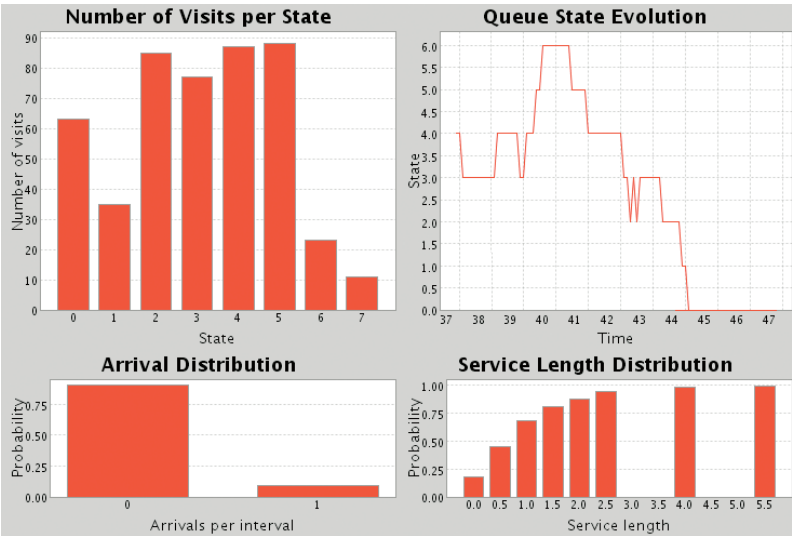


Random Fact 3.2

Computer Graphics

Generating and manipulating visual images is one of the most exciting applications of the computer. We distinguish different kinds of graphics.

Diagrams, such as numeric charts or maps, are artifacts that convey information to the viewer. They do not directly depict anything that occurs in the natural world, but are a tool for visualizing information.



Diagrams

Scenes are computer-generated images that attempt to depict images of the real or an imagined world. It turns out to be quite challenging to render light and shadows accurately. Special effort must be taken so that the images do not look too neat and simple; clouds,



Scene



Manipulated Image

rocks, leaves, and dust in the real world have a complex and somewhat random appearance. The degree of realism in these images is constantly improving.

Manipulated Images are photographs or film footage of actual events that have been converted to digital form and edited by the computer. For example, film sequences in the movie *Apollo 13* were produced by starting from actual images and changing the perspective, showing the launch of the rocket from a more dramatic viewpoint.

Computer graphics is one of the most challenging fields in computer science. It requires processing of massive amounts of information at very high speed. New algorithms are constantly invented for this purpose. Displaying an overlapping set of three-dimensional objects with curved boundaries requires advanced mathematical tools. Realistic modeling of textures and biological entities requires extensive knowledge of mathematics, physics, and biology.
