



## Introduction: Computer Graphics

by [\*Iren Valova\*](#)

Computer graphics is a fast developing field spanning many areas of life and science. In life, the term "computer graphics" relates to life-like simulations we see in movies, games, and art. In science, it relates to the math involved in the simulations, the shapes, shades, and light that are needed to make the objects and scenes believable.

This issue of Crossroads is devoted to computer graphics. We offer an array of research articles demonstrating the breadth of the field. The first one, titled "SIGGRAPH 2006: Exploring the Art and Science of Computer Graphics," written by a computer science freshman at Stanford University, is devoted to the 33rd International Conference and Exhibition on Computer Graphics and Interactive Techniques. It relates the highlights of the meeting and outlines the key points of interest for a college student.

The following article, "Digital Re-creation of a Seven-Story Building Shake during an Earthquake," by a visualization scientist at the San Diego Supercomputer Center discusses the re-creation of a seismic response of a seven-story building. The re-creation is based on observed data from a shake table test. This article brings together important issues such as earthquake disasters, structural engineering, computer simulations, and prevention techniques.

The third article, "Need for Perceptual Display Hierarchies in Visualization," coauthored by a PhD student and a faculty member with the Computer Science Department at North Carolina State University, features visualization techniques in relation to the abilities of the display environment.

Another article, "Prostate Ultrasound Image Processing," is authored by an electrical engineering sophomore with The Cooper Union. Although the topic is obvious from the

title, the article presents an algorithm to solve the challenging task of edge detection in ultrasound images. This topic, as any other pressing problem related to medical image processing, presents challenges when it comes to automation. This article is a good example of the deep interaction between computer graphics, image processing, and human vision. A task that is successfully executed by humans presents a significant challenge when it comes to simulating it on a computer.

Two more articles, "Avoid Common Pitfalls when Programming 2-D Graphics in Java" and "Using Traditional Games in Computer Science and Game Design," written by a team from McGill University and a recent graduate from the University of Massachusetts Dartmouth respectively, deal with specific issues on graphics programming in Java and the relation between the emerging discipline of game design and the games traditionally used in computer science education.

All in all, this issue presents the topic of computer graphics from many perspectives, as it deserves to be portrayed. One can find information on a cornerstone conference and the presented topics, visualization techniques as related to the used hardware, simulation techniques using observed data, and medical image processing discussion, along with more traditional topics of programming languages and their graphic limitations.

## Biography

Iren Valova is an associate professor with the Computer and Information Science Department at the University of Massachusetts Dartmouth. Her interests are in the field of medical image processing, neural networks, and brain function simulations. She is also the faculty sponsor of the Game Design Club operating at UMD.