



Visual Imaging of the Electronic Age

Course Abstract

ARCH 3702, Art2907, CS 1620, ENGRI 1620

- Prerequisites: none
- Lectures: Tuesday/Thursday, 11:30 a.m. -12:30 p.m.
- Laboratory Session? (If any) Rhodes Hall 551

No part of today's digital environments is changing faster than graphical digital imagery and its distribution. Just observe the impact of social media, the proliferation of "fake news" and our current methods of communication, including Virtual and Augmented Reality. These powerful immersive technologies are now being improved so rapidly that they will impact the entertainment, simulation, education, medical, and design industries to name a few. As mobile phones have changed the telephone and photography industries, VR and AR may hold the most promise and may ultimately become the most popular means of communication between humans and between man and the machine.

What is not realized is that VR and AR technologies are only in their formative stages, somewhat analogous to the changes between the early computer graphics of the 1960s to the digital cinema of today. It is not just the exponential increase in compute power and bandwidth but the convergence of many disciplines which enable this improvement and growth. *Devices being created, from goggles and glasses to wireless high-resolution realistic displays depend on perspective imaging, color science, perception and the understanding of the human visual system, computer science, graphics algorithms, and interfaces, and new hardware capabilities. **New topics such as multi-resolution displays, digital cameras which create 3D images, foveal rendering algorithms and how signals from the retina are interpreted by the human brain will be included. "We look with our eyes but see with our brains!"***

Professor Greenberg is recently returning from a year-long sabbatical leave where he worked at Disney Research, taught at the Swiss ETH, researched at Nvidia, and continued working on foveated rendering algorithms with computer scientists, perception psychologists and neuroscientists. During his five decades of teaching, he has won the most prestigious computer graphics awards, and sixteen of his students have won Hollywood Technical Oscars. This year he was honored with the 2020 ACM SIGGRAPH Distinguished Educator award for outstanding contributions to the computer graphics and interactive techniques. This may be the last year the course is taught. Next year he expects to teach a two-semester design course for both CS and design students and this course may serve as one of the pre-requisites.