SYSC-5807, Interactive Media & Digital Art

Carleton UNIVERSITY
Canada's Capital University

Winter 2012

Department of Systems and Computer Engineering

Course Information

Course title: Advanced Topics in Computer Systems - Interactive Media and Digital Art
Course number: SYSC-5807
Time/Day/Location: 7:30-10:00PM, Thursday, 140 Azrieli Pavilion

Course Description:
"Interactive Media and Digital Art" discusses the interactive digital technologies as new media for art and entertainment. Topics include basic concepts such as interactivity and features of the digital media, and also interactive stories, character design, net art, digital painting, and virtual dance, collaboration and social networking, among others. Advances in multimedia technologies have improved the content creation for arts and entertainment, and also provided new media and frameworks for such creativity. These new frameworks and environments are tightly related to their technological basis, in a way that they are more than just an advanced version of older artistic media. Examples are Web Art and Interactive Stories which are related to traditional visual arts and literature but have independent principles and methods of their own due to completely new nature of the media. They are, in fact, new "art forms" and their principles and technological basis need to be understood properly before they can be used. Such an understanding includes not only technical and scientific aspects but also artistic aspects and the way these two interact and affect each other.
Computer science and engineering researchers can benefit from studying these issues in a variety of ways which include:
* Better design of multimedia systems in order to provide more content creation options
* Participating in the artistic process using scientific and technical expertise in addition to artistic background
* Closer collaboration with artists and content providers in multi-disciplinary projects
Although many multimedia systems researchers have significant artistic background, graduate courses that look at multimedia systems from a mixed technical and artistic point of view are missing in most graduate programs. This course tries to be a bridge between these two camps and show multimedia researchers how their work can not only affect the artistic process but also be the main part of the art work or the entertainment product. New media are removing the boundaries between art and technology. More and more art and entertainment products are being created by people from scientific and technical backgrounds. Marshall McLuhan once said: "The Medium is the Message." If that is true, the designers of the new media ARE the new artists, and they should think about the artistic side of their work as much as the technical side!

Instructor Information

Name: Ali Arya
Email: arya AT carleton.ca
Office location: 230D Azrieli Pavilion
Office hours: TBD

Resources

Books

The course will not have a single textbook. A variety of books, articles, and online resources will be used including but not limited to the followings:
Digital Storytelling: A Creator's Guide to Interactive Entertainment, Carolyn Handler Miller, Focal Press - Elsevier, 2004
Second Person, Pat Harrigan and Noah Wardrip-Fruin (Editors), MIT Press, 2007
First Person, Noah Wardrip-Fruin and Pat Harrigan (Editors), MIT Press, 2004
Writing Spaces, Jay David Bolter, Lawrence Erlbaum Associates; 2 edition (2001)
Interactive Storytelling, Andrew S. Glassner, A.K. Peters, 2004
Chris Crawford on Interactive Storytelling, Chris Crawford, New Riders, 2003
Hamlet on Holodeck, Janet H. Murray, MIT Press, 1998
Better Game Characters by Design, Katherine Isbister, Morgan Kaufmann, 2006
Non-Photorealistic Rendering, Bruce and Amy Gooch, AK Peters, 2001
Video Games and Interactive Media, Stephane Natkin, AK Peters, 2006
Interactive Dramaturgies, Heide Hagebolling, Springer, 2004
Handbook of Virtual Humans, N. Magnenat-Thalmann and D. Thalmann, John-Wiley, 2004
Music and Emotion: Theory and Research, Patrik Juslin, Oxford University Press UK, 2001
Online Resources

Evaluation

Class Participation (in-class and online discussions) **10%**
Assignments (one for each major topic) **30%**
Intermediate Project Deliveries **20%**
Seminar Presentation (student-selected subject) **10%**
Final Project (as a take-home exam) **30%**

Topics

1- Introduction to Multimedia, Arts and Entertainment

This is an introductory talk to the basic concepts in multimedia systems and also arts and entertainment. This includes time, space, visualization, expression, and play. Historical trends and milestones will be briefly reviewed.

2- New Media

The new media such as digital computer, web, virtual and augmented reality, and immersive environments will be discussed from both technology and application points of view. The Procedural (rule-based, algorithmic), Participatory (interactive), Spatial (multi-dimensional) and Encyclopedic (massively informative) properties of

digital environments will be reviewed and examples will be given from different areas such as computer games, visualization, and user interfaces. Learning these properties is essential as the applications based the new media should be designed considering these properties and what they can provide (a new art form rather than translation of older forms into a new technology).

3- Interactivity

Interactivity is a major property of the new media and so a major concern in the applications and art forms based on such media. Knowing what interactivity means (bidirectional input-process-output cycle), we will see how it can be implemented in media such as web and computer games.

4- Computer Games, Interactive Stories and Gamification

Essentials of computer game design, distinctive features of computer games in comparison to other forms of entertainment, game AI, and the use of games as an art form (e.g. Machinima, making movies with game engines) will be discussed. An emphasis will be on educational/serious games and gamification. We will also talk about interactive stories as a related concept.

5- Virtual Characters

Virtual people are the most important part of any virtual world (e.g. story space). Different approaches to modeling geometry and behaviour of virtual characters is the topic of this part of the course. We will start from 2D and 3D computer facial animation and continue to discuss morph-based, parameterized and physically-based geometry modeling; character personality and mood; and knowledge representation and modeling the rules of behaviour. Examples will include virtual dancers and procedural animation of virtual characters.

6- Virtual Worlds and Social Networks

Virtual worlds and online communities. Online interaction and collaboration, avatar-based systems, virtual culture, and digital identity are among topics to be discussed through examples from systems such as Facebook and Second Life.

7- Digital and Interactive Art

A quick look at some technologies, approaches and projects related to digital and interactive art. Examples are Non-Photorealistic Rendering, Net Art, and Interactive Installations.

Notice to Students Regarding Academic Accommodation: You may need special arrangements to meet your academic obligations during the term because of disability, pregnancy or religious obligations. Please review the course outline promptly and contact the instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. Students with disabilities requiring academic accommodations in this course must register with the Paul Menton Centre for Students with Disabilities (PMC) for a formal evaluation of disability-related needs. Documented disabilities could include but not limited to mobility/physical impairments, specific Learning Disabilities (LD), psychiatric/psychological disabilities, sensory disabilities, Attention Deficit Hyperactivity Disorder (ADHD), and chronic medical conditions. Registered PMC students are required to contact the PMC, 613-520-6608, every term to ensure that your Instructor receives your Letter of Accommodation, no later than two weeks before the first assignment is due or the first in-class test/midterm requiring accommodations. If you only require accommodations for your formally scheduled exam(s) in any course, you must submit your request for accommodations to PMC by the last official day to withdraw from classes in each term.