USC Iovine and Young Academy
Arts, Technology and the Business of Innovation

ACAD 280: Designing for Experiences

Units: 4
Day-Time: TBD
Location: SKS 404
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Catalogue Description:
Constructing effective and elegant software interfaces, designing analytical displays of data, and exploring unconventional and innovative methods of interaction.

Pre-requisites:
ACAD 178 Motion Graphics, ACAD 275 Coding I, ACAD 276 Coding II

Course Description:
Interaction Design is the study of how people interface with machines, environments, and each other. The class focuses on how to construct effective and elegant software interfaces, design analytical displays of data, as well as explore unconventional and innovative methods of interaction. Students must combine their knowledge and skills from the disciplines of graphic design, programming, and human/machine interaction to develop their projects.

Learning Objectives:
1. Understand concepts and principles related to interaction design, interface design, data visualization, and physical computing.
2. Learn the dynamics of social interactions mediated by technology and how to change them.
3. Develop creative ideas around the concepts of telepresence, network enabled objects, and interactive environments.

Specific Topics to be Covered:
- Basic database administration using phpMyAdmin.
- Back-end web service development in PHP and SQL.
- Data visualization using Javascript and the p5.js library.
- Physical computing using Arduino and Processing.

Technological Proficiency and Hardware/Software Required:
- Laptop computer with authorized installations of the following software:
    - Adobe Creative Suite (Photoshop, Illustrator)
    - SublimeText (www.sublimetext.com) or the text editor of your choice.
    - MAMP (www.mamp.info)
    - Processing (www.processing.org)
    - p5.js (www.p5js.org)
- Arduino Uno (www.arduino.cc)

Required Readings and Supplementary Materials:
- Banzi, Massimo and Michael Shiloh. *Make: Getting Started with Arduino*. Sebastopol: Maker Media, 2015. Print. (http://a.co/1li3i72)
- Fry, Ben. *Visualizing Data: Exploring and Explaining Data with the Processing Environment*. Sebastopol: O'Reilly Media, 2008. Print. (http://amzn.com/0961392142)
- Manovich. *Introduction to Info-Aesthetics*. 2008. Article. (http://manovich.net/content/04-projects/060-introduction-to-info-aesthetics/57-article-2008.pdf)
- Manovich. *What is Visualization?* 2010. Article. (http://manovich.net/content/04-projects/064-what-is-visualization/61_article_2010.pdf)

Assignments:
1. Journal Project Proposal (3%)
    - Put together a 2 minute presentation on your journal project concept. Cover your data type, recording mechanisms, and initial ideas for representation and interface.
2. DataViz Research (3%)
    - Put together a 5 minute presentation on the data visualization project assigned to you. Research the author, the subject being visualized, and the technology and techniques being utilized to implement it.
3. Social Media Service Research (3%)
    - Put together a 5 minute presentation on a social media service/application of your choosing (no facebook, twitter, instagram, snapchat, or youtube).
4. Physical Computing Project Research (3%)
    - Put together a 5 minute presentation on the physical computing project assigned to you.
5. Sensor Research (3%)
    - Put together a 5 minute presentation on the sensor type assigned to you (light, sound, proximity, temperature, vibration, orientation, radio, resistance, etc).
6. Actuator Research (3%)
    - Put together a 5 minute presentation on the actuator type assigned to you (lights, speakers, motors, heaters, switches, shape memory alloys, etc).
7. Interactive Environment Proposal (10%)
    - Working in a group, develop a proposal for an interactive installation for the lobby of the new Iovine Young Hall. Using projectors, lights, cameras, sensors, and information systems, design an interactive environment that will engage people with the space and with each other. The experience should accommodate students of the Academy as well as outside visitors. Your proposal should include mockups of the appearance and functionality of the installation, a breakdown of the technological requirements, and a budget estimate.
8. Journal Project (25%)
    - Begin recording regular activity about your life. Your records should be happening at least once a day, but the more frequent they are the more interesting your results will be. Your journal should not be a blog, instagram account, or series of tweets… think outside the box! Your journal must provide a visual interface to your content that allows users to navigate it in an interesting way.
9. Internet of Things Project (25%)
    - Working in a group, develop a project based around concepts of telepresence, product design, service design and interaction design. Utilize web based storage of data, Arduino microcontrollers for controlling physical components, and front-end visualization techniques to interface with the physical components where necessary. Write a one page paper about your contribution to the project as well as your team member's contributions.

Grading Breakdown:

			Grading Scale:		
Journal Project	25%			A = 100 - 93	A- = 92 - 90
Internet of Things Project	25%	B+ = 89 - 87	B = 86 - 83	B- = 82 - 80	
Interactive Environment Proposal	10%	C+ = 79 - 77	C = 76 - 73	C- = 72 - 70	
Exercises (6)	18%	D+ = 69 - 67	D = 66 - 63	D- = 62 - 60	
Research Presentations (6)	18%	F = 59 and below			
Class Participation	4%				

Weekly Class Schedule:

Week	Day 1	Day 2
1	Syllabus and introductions. Journal Project.	Reading: Fry ch. 1-2 (the seven stages of visualizing data, getting started with processing). DUE: 1: Presentation of journal project proposals. Workshop: Development environment. SublimeText. MAMP. P5.js drawing basics.
2	Information Design. Playfair, Snow, Minard, Nightingale. Basic charts. Histograms, scatter plots, pie charts, line graphs. Understanding chart properties and variables.	Reading: Fry ch. 3 (mapping), Manovich (introduction to info-aesthetics, what is visualization). Exercise 1: Selecting Charts. Workshop: Loading data. Iterating over data. Data modeling. Custom classes. Sorting data. Basic chart drawing.
3	Interface to machine. Screen interface. Feltron, Fry, Weskamp, Wattenberg. Moodboards, wireframes, flowcharts, mockups. Interface elements. Responsive design. Design and the Elastic Mind exhibition.	Reading: Fry ch. 4-5 (time series, connections and correlations). DUE: 2: Presentation of dataviz research. Workshop: Introduction to PHP and SQL. phpMyAdmin. SELECT. GET and POST.
4	Typography. Typesetting. Labels & Legends. Discovery vs. explanation. Accessibility and legibility.	Reading: Fry ch. 6 (scatterplot maps). Exercise 2: Labels & Legends. Workshop: INSERT, UPDATE, and DELETE.
5	Acquiring data. APIs. Parsing data. Scraping data. Spidering.	Reading: Fry ch. 9-10 (acquiring data, parsing data). Exercise 3: DataQuest. Workshop: Designing an API.
6	Interface to each other. Telecommunication. Telepresence. Social Media. Mash-ups.	DUE: 3: Presentation of social media research. Workshop: Handling users. Cybersecurity.
7	Sharing. Ranking. Taxonomy vs. Folksonomy. Crowdsourcing.	Workshop: Join tables. Multi-user data. Exercise 4: Multi-user service.
8	Locative media. GIS. Cartography projects.	Workshop: Geolocation in javascript.. Exercise 5: Locative media application.
9	Interface to environment. Physical computing. Hardware interface.	Reading: Banzi ch. 1-3 (introduction, the arduino way, the arduino platform).

	Microcontrollers. Haptics. Teledildonics.	DUE: 4:Presentation of physical computing projects. Workshop: Introduction to Arduino and electronics.
10	SPRING BREAK: No Class	SPRING BREAK: No Class
11	Smart objects. Talk to Me Exhibition. Product design.	Reading: Banzi ch 4-5 (really getting started with arduino, advanced input and output). DUE: 5: Presentation of sensor research. Workshop: Sensors.
12	Smart spaces. Electroland, UVA, Random International. Public space. Urban infrastructure.	DUE: 6: Presentation of actuator research. Workshop: Actuators. Exercise 6: Installation ideas.
13	Internet of things.	Reading: Banzi ch. 7 (talking to the cloud). Workshop: Connecting Arduino to the internet.
14	GROUP WORK	DUE: 7: Presentation of interactive environment proposals.
15	DUE: 8: Presentation of journal projects.	DUE: 8: Presentation of journal projects.
FINAL	DUE: 9: Presentation of internet of things group projects. Submission of peer review essays.	

Academic Conduct:
Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" https://policy.usc.edu/student/scampus/part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Discrimination, sexual assault, intimate partner violence, stalking, and harassment are prohibited by the university. You are encouraged to report all incidents to the *Office of Equity and Diversity/Title IX Office* http://equity.usc.edu and/or to the *Department of Public Safety* http://dps.usc.edu. This is important for the health and safety of the whole USC community. Faculty and staff must report any information regarding an incident to the Title IX Coordinator who will provide outreach and information to the affected party. The sexual assault resource center webpage http://sarc.usc.edu fully describes reporting options. Relationship and Sexual Violence Services https://engemannshc.usc.edu/rsvp provides 24/7 confidential support.

Support Systems:
A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* http://ali.usc.edu, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://dsp.usc.edu provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* http://emergency.usc.edu will provide safety and other updates, including ways in which instruction will be continued by means of Blackboard, teleconferencing, and other technology.

Emergency Preparedness/Course Continuity in a Crisis:
If an officially-declared emergency makes travel to campus infeasible, USC Emergency Information http://emergency.usc.edu will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.