

Computational Media Research

CMPM 202, W2020

Week 1: Introduction

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Course Website & Slack Channel

Website:

https://creativecoding.soe.ucsc.edu/courses/cmpm202_w20

Slack:

<https://ucsc-cmpm202-w2020.slack.com>

About Me

- Associate Professor in UCSC's Computational Media Department, direct the Creative Coding lab
- I teach courses on media arts, data visualization, computer graphics, and computational media research
- Research areas: Visualization & Visual Analytics, Computer Graphics, VR / AR, New Media Arts
- Collaborate with scientists to design visualization tools to make it easier to reason about big data sets
- Recent areas of interest include: Representing and analyzing dynamic networks, interactive simulations of complex systems, and investigating relationships between computational media and power

Research Communities

- **ACM SIGGRAPH** 2021 Art Gallery Chair; 2018 Arts Papers Chair
- **IEEE VIS** Program Committee member for 2018-2021
- **IEEE VIS Arts Program**, General Chair, 2013-2017; Steering Committee 2018-2020
- **ACM/EG Expressive** Program Chair 2019; Papers Chair 2016; Arts Chair 2015

- Have contributed to ISEA, VR, NIME, ICMC, CHI, BigData, CSCW, UIST, and others

Computational Media Research

- This class is a forum for defining and discussing research activities in the context of an interdisciplinary department investigating computational media.
- A core philosophy of the computational media department, at least as I interpret it, is that “making” is a primary research activity. This class will encourage you to use computers to make media, and to think of computation as a medium in and of itself.
- Investigating aesthetics and creating expressive work is a useful way to develop new concepts, to formulate questions and articulate opinions about contemporary issues, to explore how contemporary audiences receive and respond to new ideas, to develop a personal connection to what is meaningful to you, to push the boundaries of how technology is used, and to think through the opportunities, challenges, and risks inherent to different forms of media.

Computational Media Research

- We'll be drawing from different work in media theory — I don't think it's remotely possible to provide a comprehensive overview of media theory in 10 weeks — but we will be reading articles either that I find provocative and want to re-read or have heard about and want to read for the first time. You'll also have a chance to find and present on writings that you are interested in.

Computational Media

- What is the discipline of Computational Media? How does it differ from other disciplines? How does it relate to Computer Science? Media Arts? Digital Humanities? Game Studies? HCI?
- What are some examples of exceptional Computational Media research outputs? Where can you see them? hear them? read them?
- How are successful examples of Computational Media research evaluated and judged?
- What are the most exciting research areas to you? Why is they important? Why are you drawn to these areas?

Course Structure

Week 1

Introduction

Weeks 2 – 6

Lecture and Discussion

Weeks 7 – 10

Work on final project: Labs, Meetings, Presentations, Writing, ...

Expectations & Deliverables

1. Writing portfolio + discussion – 20% of grade

- Each week I will ask you to explore a series of topics, answer questions, take positions on and respond to articles and artifacts, and/or generate ideas
- You will attend the Monday CM Seminar Series, and relate the speakers' ideas to the broader discussion that we are having in the class about research
- By Monday at 9pm each week, you will submit your writing via Google Docs, and before class on Tuesday you will review your classmates' responses to prepare for in-class conversation
- You will include all your writing responses as a packet in your final portfolio submission

Expectations & Deliverables

2. Smaller Projects (~2 week) – 30% of grade

- You will develop a two smaller projects using, modifying, or inspired by existing code or algorithms
 - Generative design project - use or modify or be inspired by existing code or algorithms (WFC, L-Systems, Markov chains, stigmergy...?) to create visual, sonic, or linguistic output
 - Learning from data project (neural networks)
- Goal is to practice understanding and implementing contemporary algorithms (WFC, neural style transfer, etc.) and use them to create computational media outputs
- You will create a GitHub repository with working code, clear instructions, and a short write-up with images and video documentation
- Can work alone or in small teams (3 people max)

Expectations & Deliverables

3. Final Project (~4 weeks) – 50% of grade

- You will work in a team to develop a more innovative larger group project on a topic of your choice
- You will practice defining and sharing responsibilities with your teammates
- You will give a presentation describing your research practice as well as the final outputs of the research
- You will create a GitHub repo with working code, instructions, clear delineation of responsibilities, and a public facing Readme with images and examples
- You will create a CS conference-style paper using a LaTeX ACM conference template (or a template for another conference that could potentially accept this work)

Goals of Course

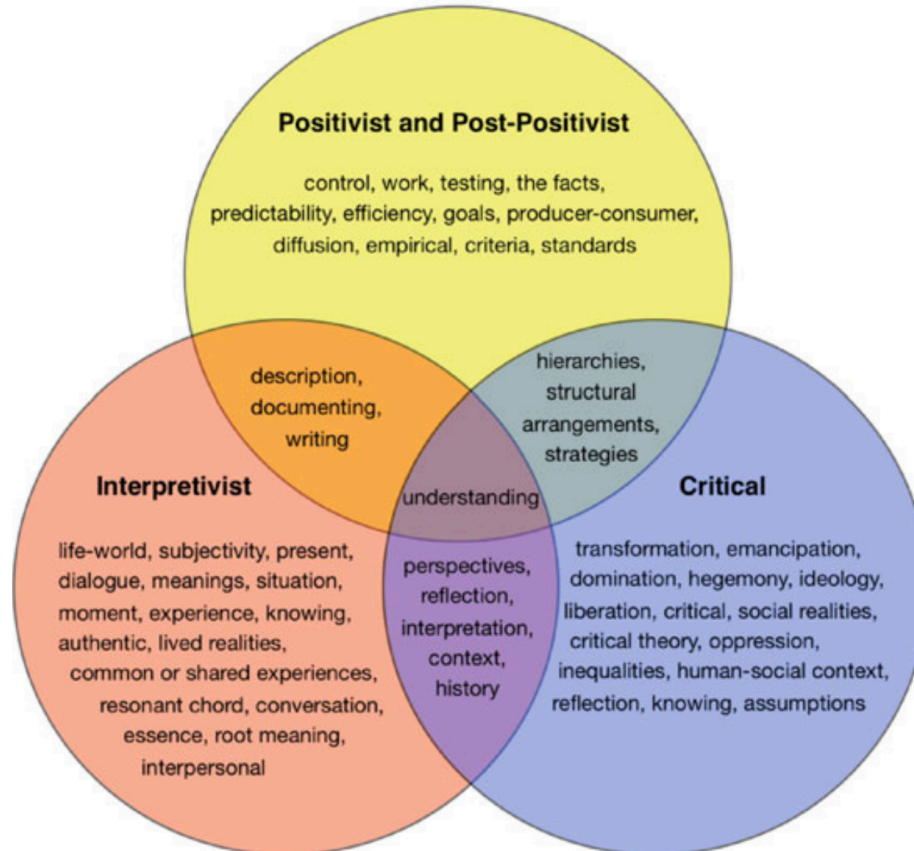
- Practice writing Computer Science conference-style papers
- Better understanding of different academic computational media-esque communities
- Continue to become more creative and rigorous thinkers, makers, scholars
- Practice working successfully in teams
- Prepare for First Year Exam (for PhD students)
- Increase proficiency in programming and using computational media tools and frameworks

CM Practical Learning Outcomes

- Synthesize fundamental CM knowledge to **describe**: the field's development, trade-offs between different project design and evaluation approaches, and the relations of these topics with each other
 - Contextualize topic areas effectively within the larger *history* of the field, draw in relevant sources beyond those directly covered in coursework, and demonstrate synthetic understanding of the material discussed
- Use knowledge of least one CM topic to **identify** a potentially *novel contribution* and relate it to prior work in the field
 - Delineate highly novel contributions that are both creative and original
 - Draw connections to contemporary areas of related work
- Use sufficient and appropriate technical knowledge to **develop** a *novel contribution*
 - Introduce new technical concepts and demonstrate successful technical innovation
 - Successfully extend an existing technical approach, or successfully use an approach new to the area

Key Words and Identifiers In Paradigms and Approaches to Research

QUANTITATIVE RESEARCH



QUALITATIVE RESEARCH

Questions

How do you define research? What does successful research look like?

What specifically are you researching? What do you imagine your thesis/dissertation research will be? How will you get there?

Which aspects of your work are the most important? The most interesting? Which communities will be interested in it? What effect will it have?

How would you explain the relevance of your research to someone from humanities, art, science, engineering? How is it research in computational media, vs other disciplines of computation (CS, CE) or media studies/media making (FDM, DANM, HAVOC, HistCon)?

For Thursday's class

- Respond to Elizabeth Swensen's talk on Monday, or her interview (optional)
- Respond to Hamming's "You and Your Research" and Ted Chiang's "Catching Crumbs"