Computational models for Media Arts and Mediation of Experiences AME 598, Spring 2007

Times: TTH 3:10 - 4:30, Space: DAR,
Instructors: Thanassis Rikakis and Hari Sundaram

Brief Description

*Computational Models for Media Arts and Hybrid Experiences* explores
- The role of computation in enabling a hybrid physical-digital world and a related hybrid culture
- The type of knowledge that results from hybrid cultural experiences and how that knowledge can contribute to a human-centric hybrid society
- how new computational models, chaos, stochastic procedures (Markov chains), non-linear dynamics, self similar systems (fractals)-, can be used to mediate complex experiences; how the models can be used to achieve the aesthetic and formal coherency necessary for attraction, engagement and immersion;
- how the resulting complex and engaging experiences can contribute knowledge of societal significance

The class is supported by experiential games in class, reading assignments and projects, analysis of art works and computational systems.

**Grading**

Project Assignments 25%, Reading Assignments (and related tests) 25%, Final 30%, Participation and attendance 20%

**Schedule of Lectures and Assignments (indicative, not absolutely fixed)**

1) Introduction; the role of computation in life and in media arts; towards a hybrid physical-digital world and a hybrid culture; a simple game based on a Pauline Oliveiro’s deep listening exercise; observing, describing, summarizing and modeling information of an experience;

2) semantics of an experience and computation; multiple levels of organization; movement, audio and vision in human physical experiences; multimodal optimization; sequential experiential understanding and computational understanding; assignment 1: attend MAX/MSP intro session with Todd Ingalls if you don’t know MAX/MSP (tentatively scheduled for Friday January 19th at 10am)

3) Sampling, analyzing and modeling information of an experience; assignment 2 given out: computational modeling of structural information of a simple physical experience

4) learning to use smallab: a simple physical-digital experience construction tool (David Birchfield, guest lecturer);

5) student assignment 2 due: presentation and discussion; preparation for assignment 3 and 4: start practicing with smallab

6) practice makes perfect; humans as skilled performers of hybrid systems; how does this influence the modeling
7) human perception and cognition vs enhanced hybrid human-computational analysis and understanding; physical experience and enhanced physical-digital experience; the role of feedback;

8) integration of human activity, sensing, modeling and feedback into a hybrid physical-digital experience; what is the resulting knowledge? Assignment 3 given out: information modeling of a simple hybrid experience

9) reading on reverberation due (Cook, chapter 8); The House of Flying daggers; predictability and unpredictability in experiences; randomness; time, space, vision and audition; models of unpredictable systems;

10) assignment no 3 due: presentation and discussion;

11) non-linear dynamics reading, first part, due (Flake, chapter 10); the bifurcation equation; stability and instability; characteristics of chaos; predictability and unpredictability/order and disorder revisited; teams for assignments 4 and 5 and final projects created

12) using computation to help structure and control a physical-digital system/experience; experiencing and learning a computational model; assignment no 4 (collaborative assignment) given out: information modeling for a mediated physical-digital experiences that takes advantage of the properties of the bifurcation equation

13) reading on Aristotle due (Poetics, sections 1-8); the triangle of life and art; the creative sequence, its societal significance and the role of computation

14) non-linear dynamics reading, second part due (Flake: TBD: either chapter 10 in more detail with experiential aspects, or chapter 11 or chapter 12; depends on class progress); the bifurcation equation; stability and instability; characteristics of chaos; predictability and unpredictability/order and disorder revisited;

15) assignment no 4 due; discussion; assignment no 5 (collaborative assignment) given out: construction of a mediated physical-digital experiences that takes advantage of the properties of the bifurcation equation; using computation to help structure and control a physical-digital system/experience continued

16) a comparative study between the Oliveiros and bifurcation experiences; what are the semantics and what is the knowledge?

17 – 18 is break

19) first Xenakis reading assignment due (Xenakis chapter 1, pages 1-16) ; principles of continuous probabilities; Poisson’s Law; Gaussian distributions

20) workshop on assignment 5

21) media arts and experiential applications of first Xenakis reading
22) presentation of assignment no 5: collaborative student projects on hybrid experiential construction that uses bifurcation equation properties; finalizing of student teams and assignment of final projects (collaborative assignment)

23) second Xenakis reading assignment due (Xenakis chapter 1, pages 22-39); Free Stochastic Music;

24) first listening assignment of Xenakis works due; discussion of Pithoprakta and Achorripsis by Ianis Xenakis

25 and 26) third Xenakis reading assignment due (Xenakis chapter II) Markovian Stochastic Theory and Music Theory; order and disorder; grains, vector space, Markov chains, Matrix of transition probabilities

27 and 28) fourth Xenakis reading assignment due (Xenakis chapter III); Markovian Stochastic Music Applications; second Xenakis listening assignment due; Analogique A and Analogique B by Ianis Xenakis

29) first workshop on final projects

30) fifth Xenakis reading assignment due (Xenakis Polytopes reading); multimodal computational experiences; Ianis Xenakis Polytopes; movement, audio and vision in human physical experiences revisited;

31) second workshops on final projects

Day of Finals: Final projects due: presentation of original, participatory, multimodal, hybrid physical-digital experience using properties of at least two computational systems taught and communicating an integrated contemporary experience; presentation and discussion

Textbooks, Software/hardware and Media (all also on reserve in AME library)

- Main Textbook:
Formalized Music (Ianis Xenakis)

- Additional chapters from
The computational beauty of nature (Gary William Flake)
Music, Cognition and Computerized Sound (Perry Cook)
The Polytopes (Ianis Xenakis)
Poetics, Aristotle

- Music Works: Pithoprakta, Achorripsis, Analogique A and Analogique B by Ianis Xenakis (they will be digitized and available online from the course website-downloading will require passwd- http://ame2.asu.edu/faculty/thanassis/courses/cme.html)

- Film: Small excerpt from House of Flying daggers

- software and hardware: smallab and all its “plug-ins” (max/msp/jitter/visual-audio sensing etc)
http://ame4.hc.asu.edu/edu/index.php/SMALLab_Technology_Reference_Guides