Explorations in Computer Science: 
Computation in Visual Arts

Syllabus

Professor
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Course Description
For years, computation was limited to text and numbers on terminals. However with the advent of graphics processing, computation has played an increasing role in the visual arts. This course will provide you with an introduction to computing that focuses on how computers create compelling static and dynamic visual images. In addition to studying the techniques of some historic and contemporary computational artists, you will learn basic principles of computation in a hands-on environment so that you can produce computer-generated art of your own. No prerequisites. Counts as quantitative-intensive. Does not count toward the major or minor in Computer Science.

Class meetings: MWF 2:30—3:20, Library 005 (C.A.V.E.)
Course web site: http://www.cs.hamilton.edu/~acampbel/courses/fall08/105
Course materials needed: pencils, straightedge, notebook, quad-rule graph paper; USB thumb-drive optional

Evaluation is based on the following. Failure in any one component is grounds for failure in the course.

Weekly and bi-weekly exercises: .....60%
Final Project: .......................................30%
Class participation: ..................................10%

Topics (tentative)
Week 0: Introductions
Week 1: Coordinate space, Primitive operations, Variables, Arithmetic, Functions
Week 2: Selection, Iteration, Vertices, Curves, Color
Week 3: Images, Tint, Typography, Angles, Waves, Circles, Arcs, Spirals, Randomness, Noise
Week 4: Translation, Rotation, Scaling, Continuous evaluation
Week 5: Writing functions, Recursion, Mouse, Keyboard
Week 6: Events
Week 7: Motion (fall break)
Week 8: Arrays, Animation, Pixels, Typography and color revisited
Week 9: Image filtering, blending, copying, masking, processing
Week 10: Object-based technique, Kinetic forms, File i/o
Week 11: User interface, objects revisited, cellular automata
Week 12: Physics, particles, springs, Final project proposal due
Thanksgiving Week
Week 13: (work in class on Final project with Professor/teaching assistant
Week 14: supervision and assistance)

Policies

1 Honesty: Follow the Hamilton Honor Code. If you don't, lots of people will be unhappy.
   1.1 Cite all sources, including any source code you didn't write yourself, no matter how small. If you don't know how to cite something, ask.
   1.2 Maintain the security of your data. If someone else manages to copy your files, you might be liable for giving unauthorized assistance, even if it was without your knowledge.
   1.3 In brief, you may discuss assignments with each other verbally. During such discussions a blackboard may be used to develop ideas, but you may not refer to any of your written work (such as paper, a computer monitor, etc.). The contents of the blackboard may not be transcribed. You may also ask each other for assistance regarding computer error messages. You must acknowledge all collaboration with appropriate academic citations.

2 Academic work:
   2.1 Assignments are due by a set deadline. Late work won't be accepted unless you make arrangements in advance. Even when you make arrangements, late work may receive a grade penalty. The penalty is at my discretion, and it depends largely on how late it is.
   2.2 If you think I've made a mistake or been unfair about a grade, it's best to bring it to me in office hours. You may appeal grading decisions no later than one week after I return the assignment to the class.
   2.3 Come to every class. Excessive class absences will incur a grade penalty. Occasionally, and with plenty of advance notice, I may decide to require your attendance at a relevant out-of-class lecture or other event. You are expected to make arrangements to be there unless you have another regularly-scheduled class at that time.
   2.4 Backups
      2.4.1 Always keep a copy of every piece of work your turn in.
      2.4.2 Make backup copies of all computer files.
      2.4.3 Also be sure to keep all graded assignments until you receive your final grade.
   2.5 Your grade is my subjective assessment of your result, not of the effort you put into it. I will try to give comments that will help you do better in the future. Grades are assigned as follows:
      - A-, A, A+ (92, 95, 98): Excellent, you did everything right, and in some notable way you exceeded my basic expectations of your work on this assignment!
      - B-, B, B+ (82, 85, 88): Good, you did most everything right.
- C-, C, C+ (72, 75, 78): Average, there are some moderate flaws as noted.
- D-, D, D+ (62, 65, 68): Poor, what you did is barely acceptable, but it passes, I guess.
- F(55): Fail, it's either severely incomplete/incorrect, or incomprehensible, or careless beyond acceptability.

I will also sometimes assign grades of A/B(90), B/C(80), C/D(70), D/F(60) when I can't decide between two levels. Clearly frivolous submissions and computer program submissions that do not compile are not accepted and receive a grade of zero (0).

At the end of the semester I'll apply your numeric scores to a weighted average and assign the letter grade of the number closest to your average: A(95), A-(92), B+(88), B(85), B-(82), C+(78), C(75), C-(72), D+(68), D(65), D-(62), F(55), FF(40).\(^1\)

An A+ is a very rare thing. Good work gets something in the B range.

Disabilities: Hamilton College will make reasonable accommodations for students with properly documented disabilities. If you are eligible to receive an accommodation and would like to request it for this course, please discuss it with me and allow two weeks notice. You will need to provide Allen Harrison, Associate Dean of Students (KJ 104; ext. 4021) with appropriate documentation of your disability.

Computer Lab Equipment:
The Department of Computer Science provides laboratory space, computer equipment, and software for your use in this course. You may only use the hardware and software that you have been authorized to use. We expect you to treat all equipment with the utmost respect and care. Modifying the configuration of any equipment without authorization is prohibited. Please report problems with labs or equipment to our department director of laboratories, Nick Brockner.

About your professor:

I have been teaching in some form or another for over 20 years. This is my tenth year at Hamilton. I concentrated in computer science and mathematics at Colgate University (A.B.), and I studied artificial intelligence at the University at Buffalo (M.S., Ph.D.). I enjoy singing, single-malt scotch, brewing beer, 12-month transportational bicycling, smoking my pipes, computer programming, and spending time with my family. My wife Colleen is a professional vocal musician, vocal music teacher and music department chair (on maternity leave) at the public high school in Mohawk, New York. We have a 4-year-old son named Aubrey, and a 6-month-old daughter named Evelyn. We all go to the St. James Episcopal Church in Clinton, where Colleen and I sing in the choir, and I am a preacher and worship leader.

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\(^1\) A numerical average precisely on a border will yield the higher grade, e.g. 80.0000 gets a B-.