

## **Live Image Processing and Performance**

### **New York University: Interactive Telecommunications Program**

**Summer, 2009 -- H79.2422**

*Your class meets on:*

Mondays and Wednesdays, 3:15-6:10 PM

*In*

Room 447

*And your instructor is:*

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### **Introduction**

Hi there. This class will teach you the ins and outs of conceptualizing, developing, and performing with real-time image processing software. We'll be looking at ways in which you can manipulate a variety of visual media (time-base and still, vector and raster, 2-D and 3-D) in performance and interactive installation situations where some sort of real-time processing or procedure is desired or necessary for the success of a piece. While we'll be focusing on creating primarily 'video'-centric work, we'll spend plenty of time looking at how to successfully integrate interactive elements from other realms (sound, physical interfaces, etc) into whatever we look at. By the end of this class everyone will have a working knowledge of how to create and execute a video performance setup and should have at least one performable piece (if not many more) that uses the ideas and techniques we've explored in class.

### **Prerequisites / Software**

Most of the technical aspects of this class will be taught using a visual development environment (Max), through a set of extensions (Jitter) that permit real-time manipulation of data matrices (a typology that encompasses, among other things, most digital forms of image). You will have a much easier time this semester if you have had some sort of exposure to Max (and its audio extension set, MSP) before taking this class. It's important to note that all of the concepts we'll be looking at are perfectly applicable to other video packages for Max (e.g. SoftVNS), other Max-like programs (e.g. puredata, jMax), or other software that can manipulate images in general (e.g. Director/Flash, Processing). For that matter, much of what we'll be talking about can be pulled off with a couple of VCRs and a Panasonic MX-50. You are more than welcome to experiment with other software (and hardware) platforms as you like, provided you keep up with the class in terms of your Max programming skills as well.

### **Texts**

The only real text for the class is the documentation available for Max, MSP, and Jitter. All three manuals (as well as additional reference documentation) are available on the web site of Cycling'74 (the company that makes the software):

<http://www.cycling74.com>

If anyone is interested in more technical reading on anything we discuss, I'll be happy to dig up a bibliography, though a carefully worded web search will often suffice.

## Resources

I strongly encourage all of you to subscribe to the Max users group mailing list (you can find it under the community page of the Cycling'74 web site). There are a lot of great resources out there for learning Max, and you can get a lot of information from the web. We'll look at some of these sites as we go through the class. In addition, all of the work I do in class will be available for you to download and play with from the class web site, as soon as I get it up and running.

In addition, we have both a discussion list for the class (**itp-lipp**) as well as an internal ITP discussion list for Max things in general, originally set up for sound discussion but open to all (**itp-sound**). I'll show everyone how to sign up for these.

The web site for the class will have all the patches and documents associated with the class available to you, as well as links to additional resources:

<http://itp.nyu.edu/~rd64/lipp/>

## Assignments and Grades

My main goal in teaching this class is twofold: to empower you to come up with some cool performance systems, and to get you thinking about what it means to 'perform' with an image. I expect everyone to keep up with the technical pace of the class, while at the same time refining and honing their ideas for what they'd like to see in their visual performance scenario. With that in mind, the assignment manifest reads something like this:

- Everyone needs to design, create, and become reasonably fluent on at least one (1) fully functioning video performance setup on which they can either perform for a reasonable length of time (e.g. a half-hour set) or integrate into an installation piece that can engage audience participants for the duration of the piece. Everyone will be expected to participate in a mid-term and final critique (in class) and a group performance / show at the end of the term. In addition, everyone is strongly encouraged to undertake at least one 'off-the-floor' performance gig during the course of the semester. Group work is welcome, as is the integration of physical interfaces / musical instruments / punk bands / small chamber ensembles / experimental dance troupes / Jacobean theater / etc. If you work in a group please remember that everyone in the group will receive the same grade (I will not attempt to discern any difference in contribution among the group). (30%)
- Everyone needs to attend class and participate. (30%)
- I'd like everyone to keep an online journal that is updated on a weekly basis once projects get rolling (no later than the fifth week of class). In addition to documenting your project, I'd like everyone to explain their creative process as well as upload samples of their source material and output material as it progresses. (20%)
- I 'strongly encourage' everyone to download and experiment with all of the Max patches created in class each week. Everyone should also go through any relevant software tutorials that I mention as well. There will be weekly Max meditative exercises starting the third week of class. Everyone needs to do at least three of these throughout the semester. (20%)
- One of the best resources for this class is New York. Everyone should try to see as many live video and visual performances as possible, both for inspiration and for critical research. I will announce any upcoming shows of interest that come up, and everyone in the class should feel free to do the same. I would like everyone to include their impression of these performances as write-ups in their project journal. Everyone should be critical of the work they've seen and be willing to share their experiences in class.

## **Class Schedule**

This schedule is subject to change depending on the interests and pace of the class, etc.

Class 1: Introduction / Class Overview. Whirlwind review / tour of Max and Jitter. Basic information on digital image representation.

Class 2: Jitter basics. Everything you ever wanted to know about QuickTime, but were afraid to ask. Movie playback, and some basic strategies for narrative and non-narrative video access in Max. Doing some interesting things to video using (very) basic math. Creating a basic VJ performance setup in Max.

Class 3: Using video effects. Simple compositing and matrix operations. Programmatic sequencing, randomness, and creating transition tables in Max. Creating an algorithmic system for video presentation.

Class 4: Compositing and lookup tables. CSO (chromakey) and lumakey techniques in Jitter. Generalized chromatic and spatial processing. Creating a flexible adaptive compositing system.

Class 5: Basic 3-D concepts. Introduction to OpenGL.

Class 6: Creating a video performance system. Dealing with lots and lots of parameters. Using audio as a control source.

Class 7: Midterm crit / discussion. Hardware setups.

Class 8: Live camera input and computer vision.

Class 9: More OpenGL. Using vector graphics systems.

Class 10: Procedural programming for image processing. Data visualization and media transcoding.

Class 11: Individual meetings (no class).

Class 12: Final performance / crit.

Enjoy the class!