Open Source Animation: DIY Motion Capture
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Wed. 09:30am–12:00pm in 406

Description: This class will use open-source software to solve interesting problems in animation, with a focus on integrating depth, motion-capture, and other kinds of live performance data into traditional film production workflows. We'll pay special attention to the Kinect, which (among other things) is the first motion capture system ever sold at Best Buy--but in order to fully realize its promise for our purposes, we'll have to get it talking to mature commercial animation software like After Effects and Maya. If the tools we need don't already exist, then we'll need to write our own. The end product of the class will be a complete animated short film and the software tools that help realize it--you can explore anything from pure visual music to narrative character puppetry. Our initial exercises will use After Effects, JavaScript, and Processing, but we can explore many other options depending on student interests. It'd be helpful to start the class with either some prior filmmaking or programming experience--but you don't necessarily need to know anything about 3D CG to do cool stuff with motion capture.

1. Review how a computer works with image and sound. Discuss the stages of production and workflow; software design and interface metaphors; advantages and disadvantages of procedural animation; montage and narrative structure. Review Processing, introduce After Effects and "Expressions," After Effects' JavaScript-based scripting language.

2. Discuss strategies for moving assets and control data between applications. Import assets into After Effects and demonstrate cutout character animation techniques. Introduce the Kinect and record mocap data for use in Processing and After Effects. Demonstrate how Expressions can be used to manipulate mocap data after it's imported into After Effects.

3. Review the Kinect and further explore the mocap process, showing how Processing can be used to generate After Effects keyframe data. In After Effects, explore strategies for organizing layers, including precomps, proxies, and parenting. Demonstrate how Expressions, audio volume level, and the Time Remap feature can be used to control playback.

4. Introduce cameras in After Effects and Processing. Discuss the challenges in coordinating camera movements across programs. Demonstrate lights, shadows, parallax backgrounds, and After Effects' Mocha matchmove utility. Discuss export scenarios in various animation programs and common pitfalls. Experiment with realtime camera control.

5. Explore techniques for drawing images with mocap and other controller data (for example, Wiimote, Wacom tablet, Razer, Android phones). Discuss OSC and its applications. Discuss motion capture's relation to rotoscoping; consider applications in classical animation and vfx. Introduce Flash as an alternative production tool, and

demonstrate ActionScript examples.

6. Explore ways to build complex 2.5D or 3D environments and combine them with various camera techniques. Discuss the potential challenges of realizing a complete model of the environment, and find ways to fix this by planning out shots based on the camera's point of view. Review using external JavaScript scripts in After Effects (bypassing the Expressions GUI).

7. Overview of 3D CG animation. Discuss alternatives to traditional 3D modeling, such as scanning or using 2.5D cards in a full 3D environment. Demonstrate OpenGL shaders and how they can be modified to work with different apps or environments. Introduce Unity as an alternative production tool, and demonstrate JavaScript examples.

8. Review the stages of production and discuss the challenges of pre-production. Briefly discuss screenplay formatting and approaches to creating storyboards. Discuss the uses of dedicated video editing programs (like Final Cut or Premiere); explain why they're still an important organizational tool even for non-traditional projects.

9. Review sound editing strategies, methods of moving data and assets between programs. Discuss the stages of audio production, and demonstrate some essential audio editing techniques. Introduce Max/MSP/Jitter as an alternative production tool.

10. Discuss the technical challenges of distribution, including legacy anamorphic formats, changing broadcast standards, and festival exhibition. Class discussion of project workflows, identifying potential pitfalls.

11. Review projects in progress; explore topics of interest suggested by students. Lab time, with individual assistance.

12. Review projects in progress; explore topics of interest suggested by students. Lab time, with individual assistance.

13. Review projects in progress; discuss any technical difficulties that remain. Lab time, with individual assistance.

14. Class critique of final projects.