Syllabus

SAAST—COMPUTER GRAPHICS

Topic:
3D Modeling for Video Games, Animation, and Machinima

University of Pennsylvania
July 2011

COURSE DESCRIPTION

Introduces students to asset design and production pipeline for 3D characters for machinima, games and animation with a focus on base modeling. Students will utilize advance graphics software packages that are prominent in the video game industry such as AutoDesk's MAYA and MudBox, and Adobe's PhotoShop. These software packages will be demonstrated from a users perspective and explained from the software engineer's point-of-view specifically for 3D character production. The students will learn the how to use the tools from multiple perspectives allowing them to think through problems that occur in the art asset pipeline. The course is focused on the application of modeling base characters with a survey of the art asset pipeline. This is a project-based class that includes a teaching strategy of short lectures, project demonstrations and one-on-one training in the lab.

The main project is broken into many stages with the goal of creating a custom character. This includes designing and modeling a base character of the students choosing. They will also learn to adapt given models.

The projects start with drawings, clay models and verbal representations of the character design, and then the students will be taught to apply professional practices to digitally sculpt their characters in MAYA 3D.

The modeling strategy and philosophy taught combines low, medium, and high resolution models in one middle resolution model that can be adapted for use in games, machinama, animations and movies. The techniques are specific and are taught from the starting with the assumption of no prior knowledge of the specific techniques. Each student's project will advance through the production pipeline at different rates, depending on the background of student and the complexity of character chosen; although, all students will be taught the entire process with the focus on base character modeling.

COURSE OBJECTIVES AND LEARNING OUTCOMES

- To teach production pipeline application for CG character development for games, animation and machinima products based on techniques that teach the foundations of original character development

- Focus on base character modeling using MAYA

- To help students learn the critical elements of digital figure modeling that distinguish levels of refinement and quality in character models

- To introduce students to applied computer graphics (CG) for the game and animation industries and the professional practices associated with character development for machinima

- To introduce students to algorithms used in specific modeling techniques including: smoothing, polygon decimation, vertex merging, edge loops selections and edge loop inserts

- To introduce students with scripting in MAYA's Embedded Language (MEL)

- To help students learn to translate design concepts into physical representations (paper, words, images and clay) and then continue with the translation into a digital representation of their character

- Assist students in mastering several complex computer graphics production software packages as used specifically for character modeling

- To help students experience the tools and learn techniques allowing them to customize their future machinima projects, enhance animations and demonstrate competency in games asset production pipeline

- Improve drawing, sculpting, and presentation abilities

- Create an exceptionally high-quality CG character that can be used for customizing games, machinima, animation, portfolios and future programming based computer science graphic courses.

LAB STRUCTURE

Regular lab/class hours are mandatory (during regularly assign class times); whereas, optional lab times (after hours) will be setup for working on projects with one-on-one time with TAs and/or instructor. The lab will have many open hours for students to work independently on their projects.

ASSIGMENTS

Each student will be required to design and develop a CG character of his or her choice. The level of development required of each student will differ depending on the complexity of the character and experience of the student as decided by the instructor. The projects will be broken down into milestones for grading purposes.

Characters choices can range from realistic to fantasy, from human to alien, or cartoon to surreal. The instructional examples will typically demonstrate modeling humanoid characters, but the techniques and practices will apply to all types of characters. I want you to have passion for the character that you choose, because you'll be spending an entire semester/program working on it.

Student's projects in the past included: elves, werewolves, humans with fish faces, Ninja, bathing suit models, Roman and Polish warriors, mannequins, aliens and fairies. The students' imaginations are the only limits.

GRADES

Students will be graded 80% on their semester long character project, 10% quizzes/assignments and 10% on their class/lab participation. The character projects will be broken down into different stages as designed by instructor uniquely per student (as each individual project will have different stages) and the 80% will be divided per the stages of individual projects.

FINAL

The final presentation of projects will be on the morning of the final Friday to family and

friends. All work will be turned in on a DVD with every saved version and all other related images after final presentations.

MATERIALS PROVIDED

- Roma Plastilina Sculpting Clay softest grade available
- Vellum Tracing Paper
- Pencil and eraser

SOFTWARE (PROVIDED IN LABS and Free Downloads from AutoDesk)

- AutoDesk MAYA
- AutoDesk MudBox
- Adobe Photoshop

A FEW READINGS, TUTORIALS AND REFERENCES FOR STARTING OFF (NO TEXT BOOKS TO PURCHASE)

- www.cgtalk.com
- www.highend3d.com
- www.pixologic.com
- www.deviantart.com
- www.daz3d.com
- www.pixar.com
- www.ilm.com