Syllabus

Spring 2020
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Meeting Times: Monday / Wednesday

08:00 AM - 10:30 AM

SCAD

The University for Creative Careers®

School of Digital Media, Department of Visual Effects, Savannah

VSFX 502 - Programming 3-D Models and Shaders
Section: 01 CRN: 31331

SCAD Mission:

SCAD prepares talented students for creative professions through engaged teaching and learning in a positively oriented university environment.

Course Description:

Students taking this course are introduced to the RenderMan Scene Description Language (RIB) and the RenderMan Shading Language (RSL). Pixars RenderMan is a widely used rendering technology used for feature animated and special effects film production. The basics of Python and MEL scripting are also covered. Prerequisite(s): None.

Course Goals: The following course goals articulate the general objectives and purpose of this course:

1. Students will learn concepts of 3-D computer graphics that underpin the use of industry-standard tools such as Maya. 2. Students will gain exposure to industry-standard scripting languages. 3. Students will learn to write shaders using the RenderMan Shading Language.

Student Learning Outcomes: The following course outcomes indicate competencies and measurable skills that students develop as a result of completing this course:

1. Students will demonstrate understanding of, and the ability to use, the format and structure of RenderMan's scene description Rib files. These are produced by applications such as Maya and Houdini.
2. Students will demonstrate understanding of, and the ability to use, the fundamentals of writing shaders using the RenderMan Shading Language (RSL) appropriate to an introductory graduate level. This includes an understanding of data types and their use for global, instance and local variables.
3. Students will demonstrate understanding of, and the ability to use, the core library of RSL functions for the manipulation of surface color and illumination.

Schedule of Classes:
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Key events including assignments, projects due dates/exam dates:

Pre-quarter assignment	Install the followin software - Maya (Personal Learning Edition is OK) RenderManForMaya and RenderManProServer (RfM & RPS) Java Runtime Environment (JRE) Cutter text editor
Unit 1:	Topics • Montgomery Hall evacuation procedure • plagiarism • establishing a common directory structure • editing, uploading & testing student web pages • configuring the Cutter text editor • Bring your popup page made from paper or card to session 2.
Unit 1:	**Review** the student self images on their portfolio index web pages. RfM Topics • rendering and rerendering (IPR), • light types, • using Pixar's subdiv attribute, • Image Tool ("it") - Save All and Histogram • Complete your popup book model model ready for session 3.

Unit 2:	**Review** the students popup book models.
	
	RfM Topics
	
	• create two categories of cameras in Maya
	    MOD_x modelling viewpoints, and
	    DOP_x cinematic viewpoints.
	• critique the student popup book models
	• presence maps
	• linear workflow
	• occlusion
	• denoising
	• Complete the popup book model tech breakdown ready for session 7

Unit 2:	RfM Topics
	[archives](#) [custom batch rendering](#)
Unit 3:	Please note change of date due to MLK being observed on Monday 21st January. Topics - finalizing the lighting, - layout and structure of a technical breakdown, [linking images to a web page](#), - linking MP4 movies to a web page.
Unit 3:	Please note change of date. **Review** the current progress of the technical breakdowns of the popup book on the student the web pages. RfM Topics [depth of field](#) [motion blur](#) - Complete the [popup book technical breakdown](#).
Unit 4:	**Final review** of the technical breakdowns for the "Popup Book" assignment. Introduction to the Open Shading Language. [using Cutter to write osl shaders](#), - compiling an OSL shader, - using an OSL shader as a [Pattern](#) with a PxrOSL node in HyperShade The OSL course of study is divided into two sections. In the first section the visual effects produced by an OSL pattern node are derived from **2D** [(UV/ST)](#) data. In the second section the effects are based on **3D** data such as surface position, orientation, curvature and surface motion. Complete the [st displacements](#) exercise ready for review session 9.
Unit 4:	Topics - metadata [using OSL with Maya + RenderMan](#)
Unit 5:	**Final Review** the ST displacement assignment. Topics - 2D Noise - developing noise shaders driven by texture space - Complete [Scanning Electron Microscope Imagery (SEM)](#) for session 11

Unit 5:	Topics - 3D Noise and other effects - developing noise shaders driven by 3D space - 3D space and coordinate system transformations - 3D textures
Unit 6:	**Final Review** the students models for the SEM assignment. Topics - adding custom primvars using mel and/or python scripts
Unit 6:	Topics - primvars and polygon brightness and coloration - primvars and polygon face color
Unit 7:	Topics - adding and reading attributes for special shading effects
Unit 7:	Topics - Color and 3D space - synchronizing displacements and color variations by height - synchronizing displacements and color variations by "facing ratio" - 3D color ramps
Unit 8:	**Final Review** the non-photorealist rendering assingment. Complete the individual project ready for final review on session 20.
Unit 8:	Students introduce the topic they intend to complete as an independent projects.
Unit 9:	Students work on their independent project.
Unit 9:	Final student presentation of their personal project. Student feedback/appraisal of the course.
Unit 10:	
Unit 10:	

Grading Opportunities:

Your overall course grade will be computed according to the following breakdown:

Assignment	Weight
popup book model	10%
popup book technical breakdown	10%
popup book - final	25%
osl: st displacements	15%
osl: non photorealism	35%
individual project	5%
Total Weight	**100 percent**

Grading Standards	Range
Letter grade: **A** = excellent	90 —100 percent
Letter grade: **B** = good	80 — 89 percent
Letter grade: **C** = *	70 — 79 percent
Letter grade: **D** = *	60 — 69 percent
Letter grade: **F** = failing	0 — 59 percent

* Refer to the student handbooks and departmental standards for minimal acceptance for passing grade.

Course Information:

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Field Trip(s):

- **Women Make Movies: Women's History Month Virtual Film Festival 2020**
  - https://www.wmm.com/womens-history-month-virtual-film-festival-2020-sign-up/?utm_source=wmm&utm_medium=blog&utm_campaign=whm-virtual-film-fest
  - **Cost: Free Access to Select Films with sign-up**
- **The Tribeca Film Festival is offering free daily short film screenings.**
  - **New short films roll out every day at 11AM**
  - https://www.tribecafilm.com/
  - https://tinyurl.com/tribshorts
- **Ann Arbor Film Festival March 24-29 "Pushing boundaries"**

- https://www.clickondetroit.com/all-about-ann-arbor/2020/03/18/ann-arbor-film-festival-to-offer-free-festival-films-film-events-online/
- BFI Flare Film Festival - dedicated to LGBTIQ+ cinema
  - https://www.bfi.org.uk/bfi-flare-home
- International Documentary Festival Amsterdam
  - https://www.idfa.nl/en/collection/documentaries?page=8&filters[tvPrice]=Free
  - Cost: Free Access to Select Films from 2019 Lineup

Extra Help Session(s):

TBA

Extended Learning Opportunities:

VISION - A VSFX Virtual Lecture Series

- "Lighting for Stylized Animation"
  - Dave Walvoord VFX Supervisor at DreamWorks Animation
  - Tuesday, April 7, 2020 at 8pm EST
  - RSVP at https://forms.gle/pvhuoiH5wPxq2cTy7
- "To Fit In, or Stand Out? That is the question for YOUR Personal Brand."
  - Cat Gulacsy, Talent Manager at Calling All Talent, LLC
  - Thursday, April 16, 2020 at 8pm EST
  - RSVP at https://forms.gle/pvhuoiH5wPxq2cTy7
- "Navigating your Network in NYC"
  - Cat Gulacsy, Talent Manager at Calling All Talent, LLC
  - Thursday, April 30, 2020 at 8pm EST
  - RSVP at https://forms.gle/pvhuoiH5wPxq2cTy7
- "Lighting for Games" – Alumni Spotlight
  - Kevin Johnson (BFA VSFX 2018) Digital Lighter at High Moon Studios, San Diego CA
  - Haley Jones (BFA VSFX 2019) Lighter at Naughty Dog, Santa Monica CA
  - Saturday May 16th at 3:00pm EST
  - RSVP at https://forms.gle/pvhuoiH5wPxq2cTy7
- "VFX: Starting Out" – Alumni Spotlight
  - Alexis "Lexi" Cabone (BFA VSFX 2018) Character Effects Artist at MPC, Montreal
  - Jessica Love (BFA VSFX 2018) Digital Lighter at Mr. X., Montreal
  - Thursday May 7th, 2020 at 8pm EST

RSVP at https://forms.gle/pvhuoiH5wPxq2cTy7

Other Course Information

Review the "Selected Works" from the Spring and Fall quarters 2019.
https://sdm.scad.edu/faculty/mkesson/vsfx502/wip/best/spring19/index.html

https://sdm.scad.edu/faculty/mkesson/vsfx502/wip/best/fall19/index.html

Course Materials:

Required Text(s):

Computer Graphics through Key Mathematics

Huw Jones

Springer

ISBN 13:9781852334222

Recommended Text(s):

Python Scripting for Maya Artists (on-line)
Chad Vernon
http://www.chadvernon.com/blog/resources/python-scripting-for-maya-artists/

Required Material(s):

A notebook and pen.

University Policies:

Academic Integrity:
Under all circumstances, students are expected to be honest in their dealings with faculty, administrative staff and other students.

In class assignments, students must submit work that fairly and accurately reflects their level of accomplishment. Any work that is not a product of the student's own efforts is considered dishonest. Students must not engage in academic dishonesty; doing so can have serious consequences.

Academic dishonesty includes, but is not limited to, the following:
1. Cheating, which includes, but is not limited to, (a) the giving or receiving of any unauthorized assistance in producing assignments or taking quizzes, tests or examinations; (b) dependence on the aid of sources including technology beyond those authorized by the instructor in writing papers, preparing reports, solving problems or carrying out other assignments; (c) the acquisition, without permission, of tests or other academic material belonging to a member of the university faculty or staff; or (d) the use of unauthorized assistance in the preparation of works of art.
2. Plagiarism, which includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. Plagiarism also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.
3. Submission of the same work in two or more classes without prior written approval of the professors of the classes involved.
4. Submission of any work not actually produced by the student submitting the work without full and clear written acknowledgement of the actual author or creator of the work.

Attendance and Personal Conduct:
Only students who are properly registered for a course may attend and participate in that class. Students are expected to attend and participate in all scheduled classes and examination periods. Absences in excess of four class periods per quarter, or 20 percent of the course, result in the student receiving a failing grade for the course. Tardiness, early departure or other time away from class in excess of 15 minutes per class session is considered absence for the class session.

The student's appearance and conduct should be appropriate and should contribute to the academic and professional atmosphere of SCAD. The university reserves the right at its sole discretion to withdraw the privilege of enrollment from any student whose conduct is detrimental to the academic environment or to the well-being of other students, faculty or staff members, or to the university facilities.

Enrollment policies:
Students are responsible for assuring proper enrollment. See the SCAD catalog for information on add/drop, withdrawals, incompletes, and academic standing.

Midterm Conference(s):
Each student enrolled in the course will have a midterm conference scheduled outside of class time with the professor. Students are expected to keep this appointment.

Academic Support and Tutoring:
Academic support for students at all SCAD locations can be found in MySCAD, under the Student Workspace tab, Department Directory, Academic Resources.

Course Evaluations:
SCAD offers students the opportunity to evaluate all scheduled courses during each quarter term. Student feedback is essential to continuously improve academic services at SCAD. Evaluations will be available the end of each quarter at the beginning of Week 8 and must be completed online by the end of Week 10. A sample course evaluation for on-ground courses is available here.
In order to access course evaluations, the student should take the following steps:

1. Log on to MySCAD
2. Click on the Student Workspace Tab
3. Locate the Course Evaluations link under My Courses channel
4. This will bring up a page that says current surveys and lists all the courses that are currently available for evaluation.

For more information or questions, contact us at evaluations@scad.edu.

Student Surveys:
Students are strongly encouraged to provide feedback on their university experience through SCAD's institutional surveys. The SCAD Student Survey and the Noel-Levitz Student Satisfaction Inventory will both be administered in spring quarter. SCAD Student Survey will be emailed to every student's email account starting in Week 1. The Noel-Levitz Student Satisfaction Inventory will be administered on paper during Week 4 of spring quarter. SCAD's office of institutional effectiveness is responsible for gathering and delivering survey results to decision-makers on campus. For more information or questions, contact us at surveys@scad.edu.