CTAN504L Creative Production in Virtual Reality

Explore the intersection of cinematic and realtime VR storytelling utilizing Quest2 headsets, 360 cameras, 3D animation, and realtime interactive techniques.

USC Cinematic Arts
2 Units, Instructor: Eric Hanson, hanson@usc.edu
Open to waive non-majors and undergars.
CTAN504L Creative Production in Virtual Reality

17990D Spring 2022, 2 units

Time: Lecture Thursdays 9:00-11:50a PST, Lab Tuesdays 9:00-11:50a PST

Location: RZC117

Instructor: Eric Hanson, hanson@usc.edu, www.blueplanetvr.com

A visual effects designer specializing in the creation of digital environments and effects for feature films, Eric Hanson has worked with noted visual effects houses such as Digital Domain, Sony Imageworks, Dream Quest Images, and Walt Disney Feature Animation. His credits include The Fifth Element (1997), Bicentennial Man (1999), Cast Away (2000), Hollow Man (2000), Mission to Mars (2000), Spider-Man (2002) and Atlantis as well as many special-venue films. Hanson is currently CEO of Blueplanet VR, a VR practice specializing in 360 capture technology, cultural heritage, and science visualization content. With a background in design, architecture, photography, and visual effects, Eric finds enormous potential in volumetric VR for creating important and meaningful experiences. Eric has also been on faculty at the USC School of Cinematic Arts since 2001, having developed curriculum in visual effects and virtual reality. Above all, Hanson wishes he could sleep more.

Office Hours: Tues 1-4p & Thurs 1-4p SCB210P or online, schedule at calendly.com/hansonusc

Teaching Assistant: TBD

IT Help: Creative Tech Help Desk, creativetech@sca.usc.edu or 213-821-4571

Course Description:

A creative VR studio course exploring the intersection of linear cinematic film and realtime immersive experience. Techniques employed will cover live-action capture with the 360 cameras, animated 3d animation utilizing Autodesk Maya, and realtime immersive narrative utilizing Unity/Unreal and Oculus Quest2 headset. Intent of the class is to build one’s maker skills and to advance the art and creative expression in the maturing field of virtual reality.

Prior knowledge of Adobe After Effects, Autodesk Maya, and Unity/Unreal helpful.

Course Requirements and Grades:

- Completion of 1 project:
Fully completed short linear cinematic VR film and/or interactive realtime media experience, [70%].

Unfinished works-in-progress will be considered incomplete. Originality, creativity, and quality of project expected.

- Final exam, multiple-choice, from lecture notes: [30%]

Attendance:

ATTENDANCE WILL BE TAKEN 10 MINUTES AFTER THE START OF CLASS. Attendance and participation are vital as many weekly assignments will be both introduced and started during the class. You will be marked tardy after ten minutes and absent after 60 minutes. Three or more absences are ground for failing the class. Three tardies equals an absence. If a student is to be absent from a class (barring an emergency) the instructor must be notified prior to the absence via phone or email.

Course Length:

15 weeks, meeting once a week, three hours each class meeting and three hours lab.

Optional Books:

“The Filmmaker’s Eye: Learning Cinematic Composition”, Gustavo Mercado, Focal Press, 2010
“3D Storytelling”, Bruce Block, Phillip McNally, Focal Press, 2013

Week 1 Jan 11  CLASS INTRO
Lecture: Intro to class, discussion of project structure and approaches, USC production protocol. Introduction to current state of virtual reality field.
 Lab Assignment: Project ideation, reference images.

- Review of class and project structure
- History of immersion and virtual reality
- Current expansion of field
- Storytelling opportunities per media
- Examples/ breakdowns

Week 2 Jan 18  FUNDAMENTALS OF IMMERSE MEDIA Lecture:
Review of imagery, key concepts of immersion.
 Lab Assignment: Project ideation.

- Physiology of immersion
- Agency versus passivity
- Methods of immersion
- Methods of interaction
- Future trends
Week 3  Jan 25  **NARRATIVE IN CINEMATIC VIRTUAL REALITY** Lecture:
Review of cinematic storytelling.
*Lab Assignment: Create storyboard.*

- Traditional linear storytelling structures
- Branching story
- Directed story
- Participant or observer
- Finding balance

Week 4  Feb 1  **CINEMATIC VIRTUAL REALITY PRODUCTION** Lecture:
Review of digital tools, technique, pipelines.
*Lab Assignment: Begin shooting.*

- Differences from conventional live action
- Impact on talent, crew
- Team structure, roles
- Digital tools in production, post, and distribution
- Production pipelines

**FIELD TRIP (OPTIONAL) Sat Feb 5th**

Week 5  Feb 8  **SHOOTING FOR CINEMATIC VIRTUAL REALITY** Lecture:
Review of cameras, support, post processing.
*Lab Assignment: Post-production of sample shot.*

- Cameras for VR
- Digital file formats
- Software review
- Stereo previewing tools
- Conforming and finishing

Week 6  Feb 15  **ANIMATION AND CGI FOR VIRTUAL REALITY** Lecture:
Review of completed shot, animation methods.
*Lab Assignment: Test shot using Adobe AfterEffects.*

- Review, critique of finished test shots
- Methods of assembled shot construction
- Autodesk Maya and 3d animation
- Panoramic imagery
- Use of Adobe AfterEffects Immersive Video
Week 7  Feb 22  POST-PRODUCTION OF CINEMATIC VIRTUAL REALITY  
Lecture: Introduction to editing and audio for VR.  
Lab Assignment: Create test edit of sample footage.

- Editorial differences in creativity
- Technical editorial differences
- Use of Adobe Premiere VR toolset
- VR players and headset review
- Ambisonic audio capture

Week 8  Mar 1  FUNDAMENTALS OF REALTIME MEDIA  
Lecture: Review of digital tools, technique, pipelines.  
Lab Assignment: Ideation of realtime project.

- Realtime versus cinematic VR
- Realtime engine tech review
- Roomscale experiences
- Review of user interaction
- Use of photogrammetry

Week 9  Mar 8  MODELING FOR REALTIME MEDIA  Lecture: Review of ideation.  
Lab Assignment: Creation of basic modeling.

- Review of modeling options for Unity engine
- Basic Autodesk Maya
- Pre-built model options
- Optimization technique

SPRING BREAK- No class Mar 15

Week 10  Mar 22  INTERACTION AND UI FOR REALTIME MEDIA  
Lecture: Review of modeling.  
Lab Assignment: Add interaction to modeling.

- Review of user interface issues
- Use of graphics
- Interaction versus narrative
- Review of controller options

Week 11  Mar 29  AUTHORING FOR REALTIME MEDIA  
Lecture: Review of UI and interaction.  
Lab Assignment: Compile for various output.

- Review of output options
- Dependency issues
• Distribution and platforms

Week 12   Apr 5  PRODUCTION OF FINAL PROJECT Lecture: Review of output, assist students.
Lab Assignment: Continue final digital production of project.

• Assist students with individual projects

Week 13   Apr 12  PRODUCTION OF FINAL PROJECT Lecture: Review of progress, assist students.
Lab Assignment: Continue final digital production of project.

• Guest speaker
• Assist students with individual projects

Week 14   Apr 19  PRODUCTION OF FINAL PROJECT Lecture: Review of progress, assist students.
Lab Assignment: Continue final digital production of project.

• Assist students with individual projects

Week 15   Apr 26  LAST CLASS MEETING, REVIEW
Lecture: Wrap up.
Lab Assignment: Finalize final digital production of project.

• Review, critique of finished VR content
• Future directions for immersive media

Study Days: Saturday Apr 30- Tues May 3

Finals Week: FINAL EXAM Tuesday May 10, 8:00a-10:00a PST, FINAL PROJECT DUE

LAB ACCESS

For weekdays, Monday - Friday, SCB is open from 8 am - 10 pm only and RZC is open all week from 8:00 am - 10 pm – Monday to Friday and 8:30 am – 10pm on weekends. There is no card access for non-majors. They can be given limited weekend access for SCB – noon – 8pm. A request has to be made by faculty to Operations operations@cinema.usc.edu with the first and last name of the student and their 10 digit USC ID#.

Everyone is encouraged to use RZC117 on weekends.
Statement on Academic Conduct and Support Systems

Academic Conduct:
Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:
Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.
Student Health Leave Coordinator – 213-821-4710
Located in the USC Support and Advocacy office, the Health Leave Coordinator processes requests for health leaves of absence and advocates for students taking such leaves when needed.
https://policy.usc.edu/student-health-leave-absence/
National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.
Relationship and Sexual Violence Prevention and Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.
Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298
equity.usc.edu, titleix.usc.edu
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations. The university also prohibits sexual assault, non-consensual sexual contact, sexual misconduct, intimate partner violence, stalking, malicious dissuasion, retaliation, and violation of interim measures.
Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity |Title IX for appropriate investigation, supportive measures, and response.
The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu
Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.
USC Campus Support & Intervention - (213) 821-4710
campussupport.usc.edu
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their
success as a student.

Diversity at USC - (213) 740-2101
diversity.usc.edu

Information on events, programs and training, the Provost’s Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call
dps.usc.edu

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
ombuds.usc.edu

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

PLEASE NOTE:

FOOD AND DRINKS (OTHER THAN WATER) ARE NOT PERMITTED IN ANY INSTRUCTIONAL SPACE IN THE SCHOOL OF CINEMATIC ARTS COMPLEX