![USC University of Southern California]

Course: CTPR 499: Special Topics (Virtual Production)

Units: 3

Prerequisites: CTPR 445 (Realtime CG Filmmaking) or CTIN 499 (Special Topics - Real Time Cinematic Production) or CTAN 564L (Motion Capture Fundamentals) or one of the following: CTPR 421 Practicum in Editing; CTPR 438 Practicum in Producing; CTPR 464 Practicum in Production Design; CTPR 534 Intermediate Production Design; CTPR 535 Intermediate Editing; CTPR 538 Intermediate Producing.

Term—Day—Time: Spring 2023 / Tue 4-6:50 Lecture / Wed 7-9:50 Lab

Location: RZC 117

Instructors: Emre Okten, Sean Bloom, John Brennan

Teaching Assistant:

Contact Info:

Course Description

Virtual production is an area that brings people together from live-action and CG disciplines with various artistic or technical skills. In keeping with this spirit, this course is a second step in virtual production where students from Production, IMGD and Animation departments will collaborate on a semester-long project and work together as a team.

Using an animatic produced in previous semesters as a starting point, teams will raise the CG production value and realize the vision of the animatic in higher fidelity using motion tracking technology. End result can either be a previs that expresses creator's intention fully or an animated short film that can be experienced with the least amount of technical hiccups.

Working as a team, filling the gaps where special skills are required and playing to the team's strengths is an important part of completing the project. From the initial breakdown of the script to the final screening, this course is an exercise in being part of a CG production where step by step an ambitious idea is brought to fruition by collaborative effort.

Learning Objectives

- Continue to develop creative work begun in previous classes such as CTPR 445
- Specialize in certain areas of virtual production while working as a crew
- Learn how to utilize motion capture technology for character performance
- Integrate virtual camera and editing to the production process

Recommended Preparation

Bring an animatic or consider various roles in virtual production to see where you'd fit best. Students will be required to either fill crew positions on a production based on an animatic created in a previous semester in the prerequisite classes or leading said production as the creator of the animatic. Directing one of the crewed class projects is based upon the presentation in the first week of class of a completed animatic created using Unity.

Some crew positions are animator, environment/3D artist, technical artist, lighting artist, FX artist, producer, editor, production designer and director.

Technological Proficiency and Hardware/Software Required

Knowledge of Unity required.

Description and Assessment of Assignments

Assignment 1: Script Breakdown

Breaking down the script to build a production plan and determine the needs for environments, assets, motion capture and VFX.

Sub-assignments: Environment & Asset breakdown, Mocap & VFX breakdown

Assignment 2: Rough Cut

Rough cut of the final project that includes every scene and script beat.

Preparatory assignments: Rough Environments, Rough Animation, Rough Camera

Assignment 3: Final Cut

Completed final cut, ready to be submitted to sound design and composers.

FINAL

Completed project of up to 10 minutes in length, with sound design and any necessary post work completed.

Grading Breakdown

Assignment	% of Grade	Due Date
Script Breakdown I & II	10	Week 2,3
Rough Cut	25	Week 10
Final Cut	30	Week 13
Final Film	35	Finals Week
Total	100	

Course Schedule

Throughout the semester, different stages of production are active, and the results of one stage are fed into the next steps. Environments, animation and camera are the main processes of a CG production, and these get refined from rough to final following the production schedule below.

Date	Due	In progress				
Week 1						
Week 2	Script Breakdown I: Environments and assets	Environment Build				
Week 3	Script Breakdown II: Mocap and VFX					
Week 4			Mocap			
Week 5						
Week 6	Environments-Rough			Vcam		
Week 7						
Week 8	Animation-Rough				Editing	
Week 9	Camera-Rough					
Week 10	Rough Cut					
Week 11						Sound
Week 12						
Week 13	Final Cut					
Week 14						
Week 15						
Final Week	Final Film					

Week 1

[01/10] LECTURE Review submitted animatics. Discuss the different roles of virtual production and organize the class into different projects.

    [01/11] *LAB Review the assets from the animatics and set up the project*

Week 2: Motion Capture Workshop - I

[01/17] LECTURE Learn how to Calibrate the mocap stage. Become familiar with the default OptiTrack marker-set and how to formally shoot in the motion capture stage.

DUE: Script Breakdown I: Environment and Asset breakdown

    [01/18] *LAB Start enhancing the environment from the animatic*

Week 3: Motion Capture Workshop – II

[01/24] LECTURE One hour of Directing in a black box Theatre and One hour for Acting for motion capture. The importance of reference camera and an early opportunity for editorial. Introduce Motionbuilder and how to retarget from the mocap skeleton to a character skeleton.

DUE: Script Breakdown II: Mocap and VFX breakdown

    [01/25] *LAB Replace the character animation in animatic with motion capture*

Week 4: Motion Capture Workshop - III

[01/31] LECTURE Visualizing in a motion capture space. Integration with virtual sets (ZULU) and ideas to help manage spatial limitations of a motion capture volume.

    [02/01] *LAB Replace camera from animatic with virtual camera*

Week 5: Motion Capture Workshop - IV

[02/07] LECTURE Introduction to a virtual camera in game engine in set. Virtual shooting and platforming as a separate process than performance capture.

    [02/08] *LAB Complete an overhauled version of the animatic scene as a crew*

Week 6: Virtual Camera

[02/14] LECTURE Review the virtual production tools available. Integrate motion capture and virtual camera into work in progress scenes.

DUE: Rough Environments

    [02/15] *LAB Start filming virtual camera shots*

Week 7: Pipeline

[02/21] LECTURE Start establishing a working pipeline from virtual camera to editing, making sure the data gets preserved over work in progress environments and animation.

> **[02/22]** *LAB Test the pipeline by rendering virtual camera shots and import to editing software*

Week 8: Progress Review

[02/28] LECTURE Review the progress on environments and motion capture.

DUE: Rough Animation

> **[03/01]** *LAB Continue working on the project*

Week 9: Progress Review

[03/07] LECTURE Review the progress on recorded virtual camera shots.

DUE: Rough Camera

> **[03/08]** *LAB Continue working on the project*

Week 10: Progress Review

[03/21] LECTURE Review rough cuts and discuss next steps.

DUE: Rough Cut

> **[03/22]** *LAB Continue working on the project*

Week 11: Progress Review

[03/28] LECTURE Discuss finalizing animation and virtual camera.

> **[03/29]** *LAB Continue working on the project*

Week 12: Progress Review

[04/04] LECTURE As the cut is being finalized, review the necessary post production steps.

> **[04/05]** *LAB Continue working on the project*

Week 13-14-15: In-class work on final projects

[04/11] [04/18] [04/25] LECTURE Working in class on their projects with the help of instructors and the SA. Reviewing concepts and techniques that need additional instruction.

DUE (Week 13): Final Cut

   [04/12] [04/19] [04/26] *LAB: Continue working on the project*

[05/09] FINAL

Presentation of the completed, fully rendered final project of up to 10 minutes with sound design.

Educational Resources

Unity Learn
https://learn.unity.com/
Unity Manual
https://docs.unity3d.com/2022.1/Documentation/Manual/index.html
Perforce U: Virtual Production 101
https://perforceu.perforce.com/vp/virtual-production-101

Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - *(213) 740-9355 – 24/7 on call*

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

988 Suicide and Crisis Lifeline - *988 for both calls and text messages – 24/7 on call*

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

Relationship and Sexual Violence Prevention Services (RSVP) - *(213) 740-9355(WELL) – 24/7 on call*

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - *(213) 740-5086*

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.

Reporting Incidents of Bias or Harassment - *(213) 740-5086 or (213) 821-8298*

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - *(213) 740-0776*

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - *(213) 740-0411*

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - *(213) 740-2101*

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*

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*

Non-emergency assistance or information.

Office of the Ombuds - *(213) 821-9556 (UPC) / (323-442-0382 (HSC)*

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.

Occupational Therapy Faculty Practice - *(323) 442-2850 or* otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.