**CSE490, Special Topics in Digital Animation: Storytelling in VR**

**General Information:**

Class Schedule: Tuesday 5:30pm – 8:30pm - Lab/

Thursday 5:30pm – 8:30pm – Lecture and Assignment Review

Lab/Class room: Sieg 327 and TBD

Instructors: Natalie Burke (Unity) and Barbara Mones (CSE)

Additional support: Karen Lund (Taproot Theatre), Bruce Hemingway (CSE), David Hunt (Unity) Cindy Ball and the NextGen team. (Oculus)

Course Staff: Erin Caswell, Cody Wilcoxon, Xavier James, Jenna Han, Sophia Baker, Diana Wang

Contact: cse490a-staff@cs.washington.edu, monesie@cs.washington.edu, natburke@cs.washington.edu, cse490a@cs.washington.edu

Class web page: arl.cs.washington.edu, cs.washington.edu/research/ap

Computer support: support@cs.washington.edu

Access to labs: [cardkey@cs.washington.edu](mailto:cardkey@cs.washington.edu)

Staff email alias: cse490a-staff@cs.washington.edu

CSE account request: https://www.cs.washington.edu/lab/support/accountapp30.pdf

Lab hour access: 24 hr with current access card.

Support maintenance: Saturday 2 am – 4 am

Staff office hours: TBD

Weekly Staff Meeting: Wednesday and Friday 12:30-2:30

*VR Film Project Starting Point:*

3D Animatic for “traditional” capstone film

<https://www.dropbox.com/s/vwuee34ajh369hn/animatic_final_compressed.mp4?dl=0>

Film Project - 2D Animatic for “ traditional “ capstone film.

<http://arl.cs.washington.edu/animation_capstone/videos/films/2018/>

*Project Goals*

**Winter Quarter: Part One**

To learn current VR tools for storytelling

To experiment with VR tools to discover storytelling options for the pre-production of one story. To investigate and develop new technical pipelines for VR storytelling.

To compare traditional methods for animated short films with current options in VR for the same story

To create an unpolished version of our capstone film in VR that is also communicated clearly to the participant and evokes a feeling or mood that is appropriate to the story.

To prepare for Spring and plan the polish for our storytelling project.

**Spring Quarter: Part Two**

To maximize Look and Feel for story support in a VR world.

Additional “story moments” to round out VR experience.

To perfect all aesthetic and technical aspects of production.

To create several formats for the same film experience.

To define and clarify both points of coherence and points of disparity between the capstone film and the VR one.

To revise course curriculum based on our experience.

To think ahead re. how to incorporate AR into the traditional and VR story pipeline.

To develop a course that would be Part Three based on incorporating the best ways of approaching storytelling with all of the tools available. Maybe consider preferring this over the Summer as **Part Three**

**Description:**

Interdisciplinary groups of students are chosen to enroll in this class. Students can apply from any school or major. The students in the class will create one story to be experienced in VR. Groups of students will collaborate during the design and execution phase of the project. The course will be split into two parts and taught over two quarters. The first part will cover the production pipeline through to story clarity and effective interaction. Part Two will continue the process through to polish. By the end of both portions of this course (spanning two Quarters), students will have created a compelling story playable in VR. At the completion of the first quarter all content will be of previs level quality and the story armature will be tested on participants to determine whether the students have met their goal.

**Resources and Textbooks:**  see below.

**Labs:**

Labs are held weekly on Tuesdays between 5:30 – 8:30. These are opportunities for all teams to work together on their portion of the film while they have access to VR equipment and course staff.

**Process:** Students in the class will be assigned to one of three groups. One group will work on the beginning of the story, one group on the middle, and one group on the ending. Groups will coordinate and collaborate frequently in order to guarantee cohesion between the different story segments as part of the production pipeline.

Here’s the rundown for Winter 2018

**Outline and Projects/assignments:**

**Week 1 – 1/4 – Experience VR**

**Lecture:**

Syllabus Overview

Compare VR and traditional film. Review Pearl in two versions.

Screen our current reels and have discussion re. what is needed for the current film to be VR ready**.**

**Assignment 1** (due 1/11):

Work with your team develop a VR production plan that outlines: what additional animations are needed to each shot in your Act assignment. Define how many and what additional props may be needed to orient people in space (include where they would be in the space) Select the four most important “signature shot transitions” in your act of the story. Then, present ideas re. how to smoothly transition the viewer through these different shots. Include ideas for how to augment the story with additional elements that will encourage player discovery and “replayability.” These can be props or they can be additional characters. Anything we add will need significant story justification.

**Lab: work with your group on Assignment 1**

**Define individual Goals.**

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**Week 2 – 1/11 - VR and Cinema**

**Turn in Assignment 1**

**Turn in Self and Group Critique**

**Review: Assignment 1**

**Lab: work with your group on Assignment 1**

**Define individual Goals.**

**Lecture:** Defining a new language for film. What is your *frame* in VR? How do you edit for VR?

**Assignment 2** (due 1/18): Each team will rework the existing 2D storyboard for their section of the story to be appropriate for VR. Teams will design the experience path they want the viewers to take.

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**Week 3 – 1/18 – Runtime development**

**Turn in Assignment 2**

**Turn in Self and Group Critique**

**Review: Assignment 2**

**Lab: work with your group on current Assignment**

**Define individual Goals.**

**Lecture:**

Intro to using Unity.

Intro to VR development.

Authoring content for runtime.

**Assignment 3 (progress due 1/25):**

VR previs using existing block models and animations. Specifics to follow based on your assigned group.

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**Week 4 – 1/25 – Designing for VR**

**Turn in Assignment 3**

**Turn in Self and Group Critique**

**Review Assignment 3**

**Lab: work with your group on current Assignment**

**Define individual Goals.**

**Lecture:** History of VR.

How VR creates Presence.

Creating comfortable VR experiences.

Good vs bad VR experiences

Giving your player identity

**Assignment 4** (progress due 2/1): Finish initial previs iteration and be prepared for playtesting. Create Q and A form for play testers to fill out after experience.

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**Week 5 – 2/1 – Space and Scale in VR**

**Turn in Assignment 4**

**Turn in Self and Group Critique**

**Review Assignment 4**

**Lab: work with your group on current Assignment**

**Define individual Goals.**

**Lecture:** Height differences.

How distance and scale create emotional responses.

Moving in VR.

**Assignment 5** (due 2/8): Experiment with manipulation of space in your previs.

You could edit a portion to force the player to look at the ground, at the roof, lean back in their chair, lean forward, etc.

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**Week 6 – 2/8 – Motion Design**

**Turn in Assignment 5**

**Turn in Self and Group Critique**

**Review Assignment 5**

**Lab: work with your group on current Assignment**

**Define individual Goals.**

**Lecture:** Timing in VR.

Animation in VR vs film.

How movement draw the eyes.

**Assignment 6 (**due 2/20):

Iterate on the timing of your VR previs based on the lessons from class.

Adjust a segment/shot of your experiment to encourage peripheral discovery by your player.

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**Week 7 – 2/20 – Interactive Design**

**Turn in Assignment 6**

**Turn in Self and Group Critique**

**Review Assignment 6**

**Lab: work with your group on current Assignment**

**Define individual Goals.**

**Lecture:** The interactive storytelling spectrum.

Including agency in your design.

Gaze based interaction.

**Assignment 7**(due 2/22): Update the previs in your Group as appropriate such that different portions of the story trigger based on where the player is looking.

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**Week 8 – 2/22 – Audio Design**

**Turn in Assignment 7**

**Turn in Self and Group Critique**

**Review Assignment 7**

**Lab: work with your group on current Assignment**

**Define individual Goals.**

**Lecture:**

Drawing attention with sound.

Audio for VR

Spatial audio

**Assignment 8** (due 3/1): Add SFX to your previs appropriately for VR.

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**Week 9 – 3/1 – Visual Design**

**Turn in Assignment 8**

**Turn in Self and Group Critique**

**Review Assignment 8**

**Lab: work with your group on current Assignment**

**Define individual Goals.**

**Lecture:** Drawing attention with color and lighting

Runtime lighting and shading

Post processing

**Assignment 9** (due 3/8): Iterate on lighting, shading, and post processing of your previs so that it strategically draws attention and is appropriate for VR

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**Week 10 – 3/8 - Performance**

**Turn in Assignment 9**

**Turn in Self and Group Critique**

**Review Assignment 9**

**Lab: work with your group on current Assignment**

**Define individual Goals.**

**Lecture:** Optimizing your scene

Performance profiling

Putting the three story segments together

**Assignment 9** (due 3/15): Put three segments together into a final film. Guarantee everything runs at 60 fps, prepare for playtests.

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**Week 11 – 3/15 – Fresh Eyes**

Time for people to play — and enjoy your/their experience!

**Grading Policy:**

* Attendance/Participation - 20%
* Weekly Assignments: 30%
* Technical: 15%
* Aesthetic: 15%
* Professionalism: 20%

**Late Policy:**

**See Participation above**

**Absence: See Participation above**

**Lab Rules:**

1. Only students of the Animation Capstone are allowed in the labs. Anyone else must obtain specific permission from Barbara Mones before entering. This means no girlfriends/boyfriends/family members, etc. This is for the safety of the students as well as the security of our equipment.
2. Our cse490 lab (CSE Sieg room 327) and CSE Sieg Room 319 must be kept clean. They are community spaces, and it is important that they stay as clean as possible for everyone who uses them. This means keeping your own workstation clean, as well as doing your part to keep the floor and refrigerator clean. The kitchen in Sieg 319 is also used by other programs, so it is essential that you clean up your own messes, as well as return any dishes you may use as soon as possible after you're finished using them.
3. Always follow the golden rules within our lab spaces.

[http://courses.cs.washington.edu/courses/cse458/16au/administrative/the\_golden\_rules.html](file:///\\csenetid\cs\cse\web\courses\cse490j\18wi\administrative\%22)

**Helpful Resources**

Aggregation of General VR Design Resources

<https://github.com/mauricesvay/awesome-vr-ux>

Unity and VR

[https://unity3d.com/learn/tutorials](https://unity3d.com/learn/tutorials%20) - General unity Tutorial resources. https://unity3d.com/learn/tutorials/s/virtual-reality- These are out of date in terms of the details, but the essential best practices remain the same. https://developer.oculus.com/documentation/unity/latest/concepts/book-unity-dg/ - Unity development guides for Oculus. https://developer.oculus.com/design/latest/concepts/book-bp/ - General VR best practices (Oculus) https://unity3d.com/learn/tutorials/s/scripting - C# scripting in Unity [https://www.youtube.com/watch?v=datOOos-944](https://www.youtube.com/watch?v=datOOos-944%20) - XR (AR and VR) graphics overview and best practices

General Design

https://www.youtube.com/watch?v=RNypfiiyI8A&feature=youtu.be - VR design guidelines and VR Interaction design <https://www.youtube.com/watch?v=s6gI_CMQAmE&feature=youtu.be> - interactions in VR - affordances, signifiers, mapping etc. <https://www.youtube.com/watch?v=nuCeu_eRbMI> - Oculus new user experience presentation - good source for design inspiration

VR and Cinema

[https://medium.com/the-language-of-vr/tagged/editing](https://medium.com/the-language-of-vr/tagged/editing%20) - VR and film making

https://www.youtube.com/watch?v=t3xDgONMdlM - VR and cinema

Books

*VR UX* by Casey Fictum

*The VR Book: Human-Centered Design for Virtual Reality* by Jason Jerald

**VR Groups**

**Act 1**

Rund

Erika

Travis

Amara

**Act 2**

Carson

Cat

Vlad

Andrew

Nick

Casey

**Act 3**

Alex

Jackie

Bryan

Danette