Creative Simulation Technologies (CST) 2019
8th April to 28th June 2019 - The Animation Workshop, VIA UC

Course contents

Week 1	8 - 12 April	**Intro & Planning**
Week 2	15 - 19 April	**Research, Software & Problem Solving**
Week 3	22 - 26 April	**Houdini**
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Week 5	6 - 10 May	**TouchDesigner**
Week 6	13 - 17 May	**Game Engines**
Week 7	20 - 24 May	**Game Engines**
Week 8	27 - 31 May	**Coding**
Week 9	3 - 7 June	**Coding**
Week 10	10 - 14 June	**Project Work**
Week 11	17 - 21 June	**Project Work**
Week 12	24 - 28 June	**Finalization & Marketing**

Format of teaching
We do not have any teachers on staff at The Animation Workshop, VIA UC. Instead, we bring in professional artists from studios to teach for a limited number of weeks. In general, the teacher will do lectures/demos in the mornings followed by exercises and project work in the afternoons. Hands-on sessions are accompanied by 1-on-1 feedback or dailies and weeklies with the whole group. The classroom is set up with a computer for each of the participants, and a teacher computer hooked up to a projector, making it easy to switch between demos/lectures and hands-on work.

Course instructional method:
- Lectures, demonstrations, walk-throughs from instructors/industry practitioners, hands-on work, guided mentorship through notable stages of individualized projects.
- Biweekly milestone review. Weekly group critique.
- All modules will include lectures and extensive hands-on experience.

Class hours
Normal class hours are 9:00 to 16:30, but evening/weekend homework must be expected.

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Module overview

Week 1 - Introduction, Overview, Brainstorming, Planning, Drafting

Teacher: Andrew Lowell, US. Houdini FX Trainer / Technical Director. For many years Andrew has been recognized by industry as an FX TD and trainer. Movie credits/studios include *Mummy 3*, *Aliens in the Attic*, *Invictus*, *Thor*, *Sucker Punch*, *Transformers 3*, *Jack the Giant Slayer*, and *Ender's Game* at studios such as Digital Domain, Rhythm and Hues, and Animal Logic. He's conducted many seminars around the world and written articles, authored a Houdini book, and also conducts formal training at dedicated institutions such as The Animation Workshop, VIA UC and FXPHD.

The first week of the course will consist of basic orientation activities and personal introductions. The software and workstations used for the course will be introduced in a tour and demonstration sense. Student tasks will consist of project idea generation, research, and planning. The final group screening at the end of the week will showcase project ideas for approval to the instructor and possibly other administration staff.

Week 2 - Research, software introductions and theory, problem solving

Teacher: Andrew Lowell, US. Houdini FX Trainer / Technical Director.

This week will serve to get the ball rolling for future lectures as well as project work. The primary student task will be diving into more thorough research into existing solutions and precedents for solving the simulation task. Also research into the science, art, and role of such simulations and phenomenon should be undertaken. Lectures consist of broad reaching theory of simulation technologies as well as basic introductions to the varied software used in the course.

Week 3 - Houdini lectures and classwork

Teacher: Andrew Lowell, US. Houdini FX Trainer / Technical Director.

Primarily a lecture week covering fundamentals on 3D geometry, forming the foundation for many projects. Houdini is used as the core 3D program and this is used to generate many types of geometry using the SOPs context. Basic lessons will loosely correlate with student project needs; while ensuring geometry fundamentals are taught as the primary focus.

Week 4 - Houdini lectures and classwork

Teacher: Andrew Lowell, US. Houdini FX Trainer / Technical Director.

A lecture week with a focus on dynamics simulation in Houdini. Theory and application of complex physics based solvers is explored with examples and lectures. A variety of different simulations such as rigid bodies, fluids, and crowd should be introduced. This lecture week gives necessary knowledge to complete non-real time, highly accurate simulations for projects.

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Week 5 - TouchDesigner lectures and classwork
Teacher: Andrew Lowell, US. Houdini FX Trainer / Technical Director.

This week covers real-time simulation technology and theory using TouchDesigner software. Students already have a basis from their Houdini studies as TouchDesigner is Houdini's real-time cousin. Lectures should be divided into introductory and in-depth categories by the instructor so that students notably without real-time/interactive components to their projects can optionally continue project work instead of undergo lectures.

Week 6 - Game Engines lectures and classwork
Potential teacher: Freek Hoekstra, NL. Procedural technical artist at EA Vancouver.

An industry standard game engine is introduced and explored. This will give students the ability to tailor their projects in an accelerated user interactive environment. Lectures should be divided into introductory and in-depth categories by the instructor so that students notably without the needs of a game engine in their projects can optionally continue project work instead of undergo lectures.

Week 7 - Game Engines lectures and classwork
Potential teacher: Freek Hoekstra, NL. Procedural technical artist at EA Vancouver.

A continuation of game engine labs and lectures from the previous week. User interaction and in-game simulation is focused on. Students without strong game-engine needs in their projects can optionally focus on project work while opting out of lectures.

Week 8 - Coding lectures and classwork
Expected teacher: Jeronimo Maggi, IT/AR. FX Technical Director at Method Studios. Pipeline TD.

The first of two weeks dedicated to taking more manual control over a simulation via coding. This could take the form of a custom IO between a type of data and the simulation package, or creative an optimized workflow within a program/engine. The first week focuses on coding basics in a variety of languages such as Python, and C++. Students who need a minimal amount of coding for their projects can opt out of the more advanced lectures to continue project work.

Week 9 - Coding lectures and classwork
Expected teacher: Jeronimo Maggi, IT/AR. FX Technical Director at Method Studios. Pipeline TD.

The second week of coding involves project application in its raw form or in one of the other applications such as Houdini, TouchDesigner, or the game engine. The instructor will guide the students in setting milestones throughout the week complemented by lectures specific to project needs.

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Week 10 – Project work
Teacher: Andrew Lowell, US. Houdini FX Trainer / Technical Director.

This week is solely dedicated to project work. Students will use their previously gained knowledge of simulation software to carry out their project objectives. Strict milestones for development will be adhered to with an emphasis on global completion.

Week 11 – Project work
Teacher: Andrew Lowell, US. Houdini FX Trainer / Technical Director.

This week is solely dedicated to project work. Students will use their previously gained knowledge of simulation software to carry out their project objectives. Strict milestones for development will be adhered to with an emphasis on simulation tweaking and finalization.

Week 12 - Finalization and marketing, applications
Teacher: Andrew Lowell, US. Houdini FX Trainer / Technical Director.

The final week of the course should focus on showcasing and marketing work as opposed to the creation of new assets. A case study will be assembled as complementary and supporting explanations of the work undertaken for prospective employers. Research into companies of interest is also undertaken.

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