**Effects Parts 1-4 Outline**

This is just an overview of topics covered for this demo. These things are also covered in depth in the project write-up and exercises on the course website:

[www.cs.washington.edu/458](http://www.cs.washington.edu/458)

**What is Effects?**

* Effects are things that don’t fit into the normal pipeline.
* “Visual EFX” are “real world” effects. All other EFX are digital effects.
* How do we use old tools for things such as…
* Rain, Fire, Crowds, An explosion, Hair, a Cape, a Flag
* Let’s try Modeling a flag
* Other ways to do this: #1 is Simulation
* Important to note: literally every program works differently
* The assignment: Do a lot of short projects, to introduce to different types of effects
* Then, take your newfound knowledge, and remix it into something cool

**Simulation**

* Many types of simulation
* Simulations are based off of things that happen in the real world
* Crowds, water, lots of non-deforming “hard” objects, deforming “soft” objects
* Our flag is a soft object

**Make a Cloth**

* Simple simulated cloth
* FX Shelf
* nCloth, Maya’s cloth Simulation
* Overview of our new nodes:
* Mesh, nucleus, nCloth
* Name your objects! Very important for effects
* Nucleus: Introduction to Solvers
* Nucleus determines the universe in which the effect is happening
* Cloth just falls! Why?
* Give it something to collide with.
* What if we make it an nCloth?
* Therefore, Passive Collider (New node)

**Adjust a Cloth**

* Tweak all kinds of attributes
* Using the timeline
* Magic Frame #1
* Cloth pre-sets
* Interactive feedback

**Make a Flag**

* Create a new nCloth
* Constraints (nConstraint -> component, new dynamicConstraint node)
* Wind: lets go back to that nucleus
* Fields
* What is a State of a simulation
* Simulation evaluation
* Scrubbing the time slider re-evaluates
* Preserve by “cacheing”
* Caching: Saving a set of calculations so they don’t need to be re-calculated each time
* Set your project!

**Hard Body Simulation**

* Hard body vs. Soft Body, Part 2
* Let’s talk about hard body
* What objects should be simulated?
* Cards, garbage, marbles…? Dominoes!

**Collision Detection**

* Make a sphere, apply a collider
* How do colliders of various types work?
* What about complicated collider shapes – compound! (expensive)
* Switch viewport of maya collider is weird
* Use Maya documentation for more informationon ALL effects

**Scripts as an Effects Tool**

* What is a script?
* Download the dominoes script
* Open up the scripts editor
* Scripts are valuable (necessary!) time-saving tool
* Efx is all about saving time

**Make Dominoes**

* Collidable Objects vs. Active Objects
* Needs a collider – a box, that will hit other boxes
* Let’s try it on the dominoes!
* Whoops, they fall again. Add a ground
* Now one is wiggling? Why do you think that is?
* Reset the center of gravity
* Now its clipping? Why?
* Reset its collider shape offset
* Show how the collider shape offset works

**How to Bake a Dominoes**

* Timeline – playback speed
* Every frame -> max RealTIme
* What happens to dominoes after they fall
* Need more control! Can’t just go in and stop them
* So, turn them into keys (edit -> keys -> bake sim)
* Use Bake simulation (options) to only bake translation and rotation
* What’s the difference between baking and caching
* Playback’s busted: delete the bullet system
* Now you can delete off those keys
* So, do it! Assignment requires you to delete all those extra keys. No jitters!

**Liquid Simulation**

* Several different kinds in Maya!
* In fact, lots of ways to do all these things
* We show you one way. Feel free to explore others in the part 2 of the assignment
* biFrost (new plugin)

**Container**

* As in both other cases, we need to have something for the simulation to sit on
* Or, in this case, inside of
* Delete the history on the created shapes
* Apply bifrost to this container, new node: BiFrost Liquid
* Create a liquid -> need container to be a collider -> time slider colors

**Liquid Attributes**

* While time slider is in yellow mode, we can keep working (still evaluating)
* LiquidContainer: droplet Threshold (biFrostLiquidContainer -> emission -> droplet)
* How “sticky” your water is (.8 is ok)
* Emitters: The inner box! Shape node, Bifrost -> liquid emission -> continuous
* What is an emitter?
* Shell vs Solid
* Not sticky enough? Try stickiness!

**BiFrost Display**

* We’re obviously not looking at the end result
* This is common in effects, a fast way of looking that doesn’t require full render time
* Rendering is expensive!
* These are particles, tiny little interacting points. More on them later
* We can also use Voxels, 3D blobs that give a similar effect.
* Can change colors in color channel remap
* Flush the scratch cache to get rid of the current simulation

**Rendering biFrost**

* We need a very expensive setting turned on
* “BiFrost Meshing” in the same biFrostLiquidContainer node
* new Node! And a new calculation
* Now, light your water, and render it (need mental ray & do 3 rendered stills)

**Last Simulation: XGen**

* Hair, and vegetation, and other strand-like repeated objects
* First off, can use presets – xgen -> preset library
* Let’s just apply a preset and stick it on a sphere
* Play with the attributes until you find something that you like

**XGen Descriptions**

* Create a plane, create a description on it
* Right now, looks like hair! But we can change this.
* Mess with the settings until you make something that looks cool
* Use length, density, and width to make it more visible
* Also, create a new texture material and apply it to the object!
* Once you’re done, render it out, and that’s simulation!
* Generate a new preset based on your sim: Generate -> export as preset