



Intro to Proceduralism

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Outline

DEFINITION

PROCEDURALISM AND YOU

PROCEDURALISM FOR OTHERS

PROCEDURALISM FOR EVERYBODY

BACKGROUND

Game Dev – Switch to Dev

DEFINITION

Proceduralism? – Series of Procedures, set of instructions, recipes

Different Types (OFFLINE LOAD TIME RUN TIME)

Why should you care? Does your studio crunch? Do artists ever lose work due to changing direction? Reduced scope and deep cuts?

Advantages/Disadvantages

Gotchas

Misconception 1 – Super technical programmer mind, for AAA big studios

Misconception 2 – Super weird experimental

Basic Example, brick wall in Substance

Next Example, **brick wall in Houdini**

Not a sales pitch, you can do this in Maya, Modo, Substance, Fusion 360 or with internal tools

HOW TO APPROACH A PROBLEM

Walk around your studio and ask what people are doing that they hate
If it's boring it's likely repetitive, if it's repetitive you can automate it
Build a pipeline around it

Don't argue, show

Show how fast people can work

How easy it is to make changes

How much more content you can generate

Case Study, **Dirt Skirts**

Misconception 2 – Robots are taking artists jobs

HOW TO GET TIME AND CONVINCE PEOPLE

Avoiding the Panic Curve

Misconception 3 – Proceduralism is the silver bullet

Solve problems in steps, if you can't get to all the steps at least you made it faster

Case Study – **Cables and Pipes**

All or nothing solutions can be dangerous but sometimes only way to convince higher ups

Ask for forgiveness not permission AKA Do it in your free time

Look at examples of this being done successfully

Show Examples

HOW DISTRIBUTE AND FOSTER PROCEDURALISM IN YOUR STUDIO

Buy in from different departments

Environments and FX is low hanging fruit

Characters, Concept

Embed workflows into other tools
Case Study, **Modular Set**

FUTURE

How to keep pushing automation
Where can this go?
How to get to Proceduralism 102?



Background

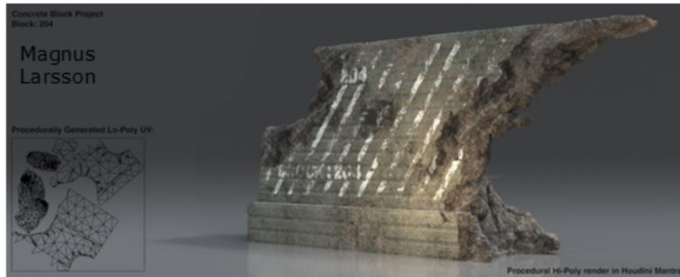
Ex Game Dev, Software Dev

Not Houdini sales pitch



What is Proceduralism (PCG)?

Generating content through procedures





5

Different Types of Proceduralism



OFFLINE

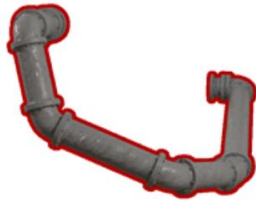


LOAD TIME



RUN TIME

Different Types of Proceduralism



OFFLINE



LOAD TIME



RUN TIME

Why should I care?

Crunch?

Lost Work?

Scope Reduction?



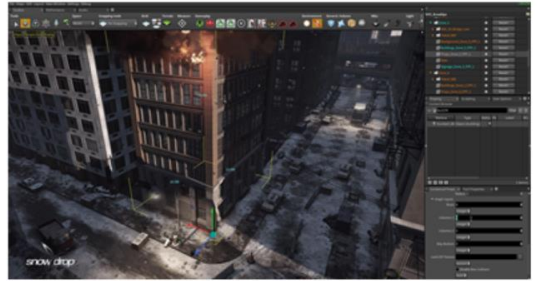
Misconception 1

“PCG is this weird oddball things that indies do in RogueLikes”

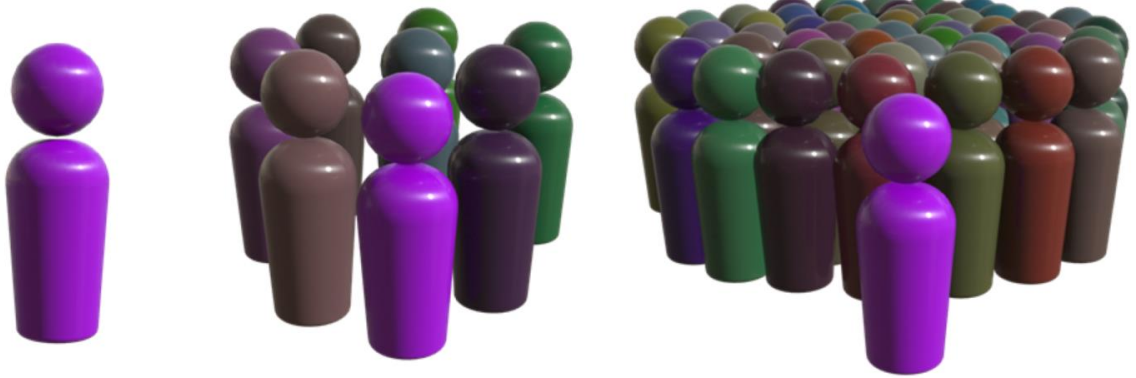


Misconception 2

“PCG is something that you need a whole development team for”



Usual Evolution



Level 1 – Proof of Concept



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Getting Started

Identify a Problem

Get Time to Fix problem

Fix Problem





Identify a Problem

Walk around

Boring and repetitive

Bottlenecks



Understanding the Workflow

“Talk to Artists and then build robots that do the same thing”

Go through the process

Do it once by hand

Misconception 3

Training my replacement
Real fear of Automation



Freeing Artists to be Artists
More content

Goldfish Paradigm

Productivity = More content

Productivity! = Earlier release

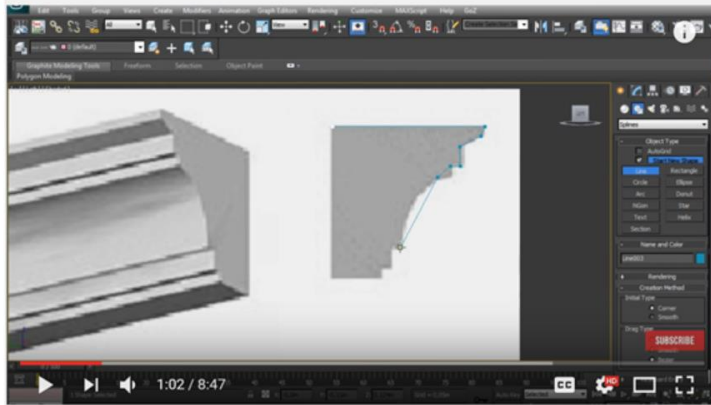


Base Boards/Crown Molding





Trace curve with spline tool





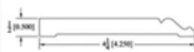
Find Manufacturer's Specs



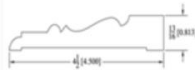
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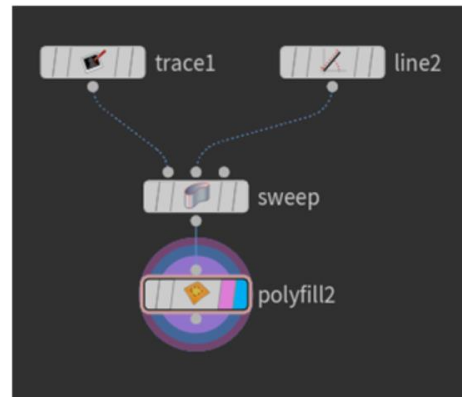
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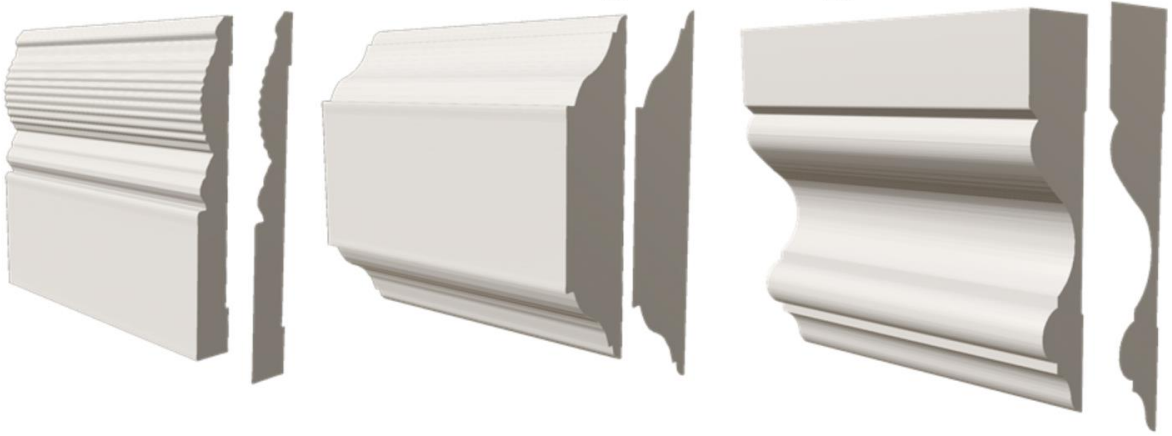
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Trace and Sweep





Now we're cooking with gas

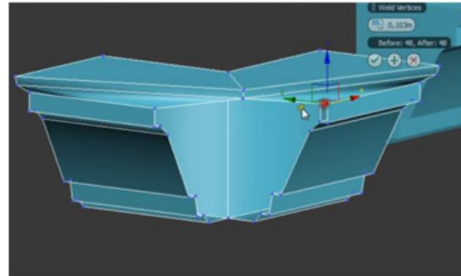
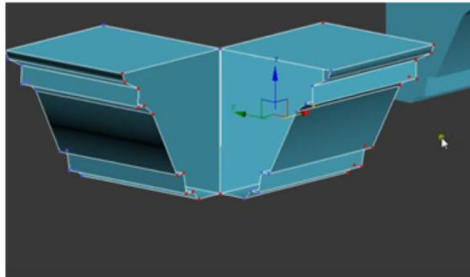




Corners

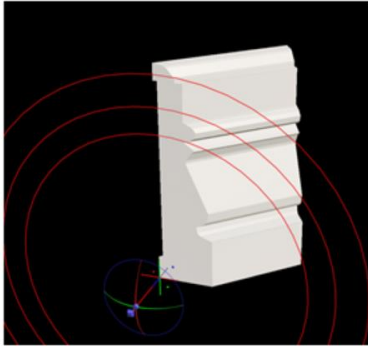


Corners Worst Case

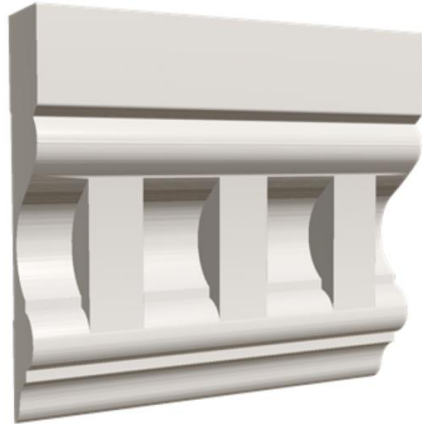




Clip



Why Not Sweep?



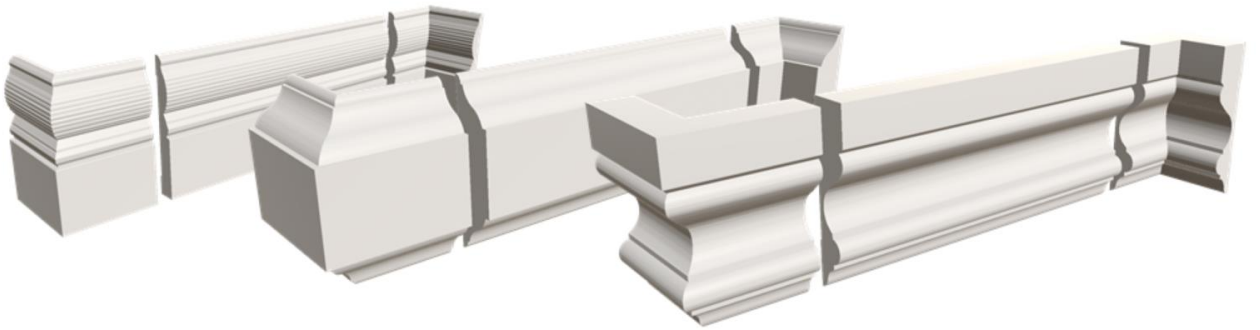


Full Set



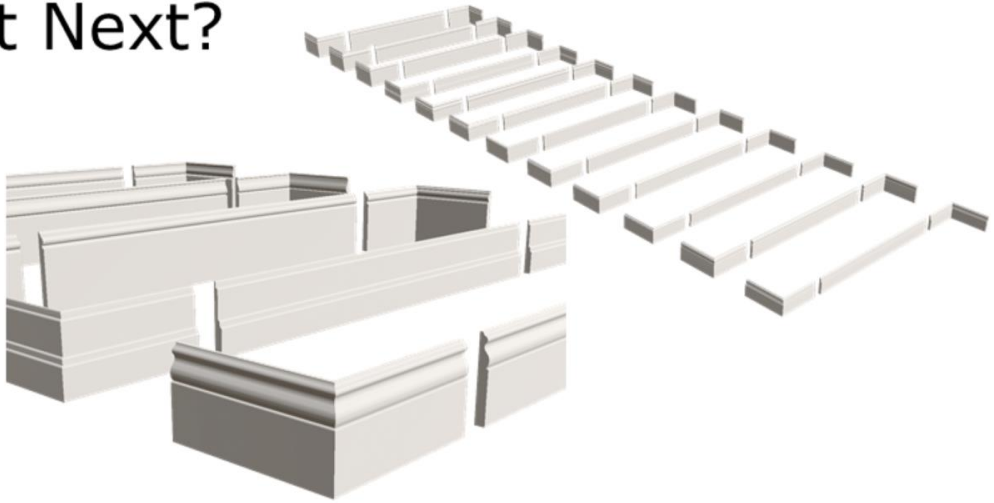


Non Destructive, Remember?





What Next?



Level 2 – Production Ready



Producers and Managers
How come we're not doing that?
Buzzword Factor



Tools for Other People

Convince Task Keepers

Encapsulate the problem



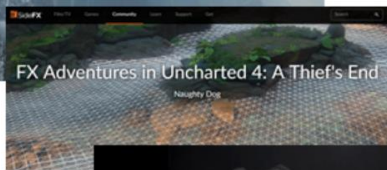


Don't Argue, Show

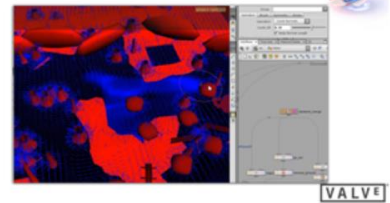
There will always be people saying it can't be done



Gianny Story



Houdini – “Combing” Vector Field



Look at examples of this being done successfully



Pitch the tools as buying time

Most valuable resource

Time = ?





Get Buy In From Teams, work with them



Show how fast people can be

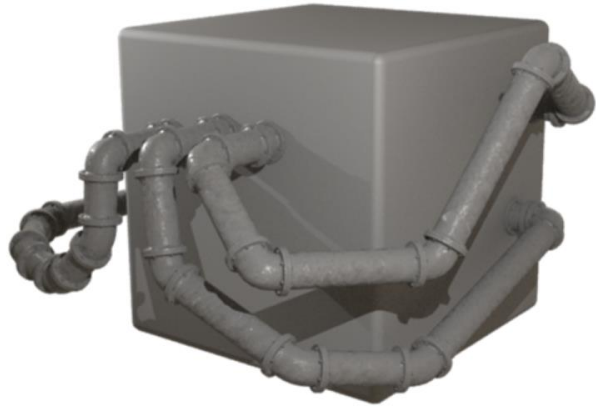
How much content you can produce

How fast you can iterate

"Just takes me 5 minutes"

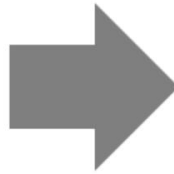
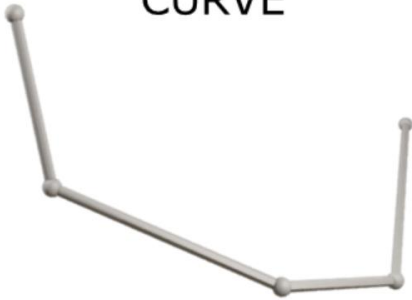


PIPE TOOL

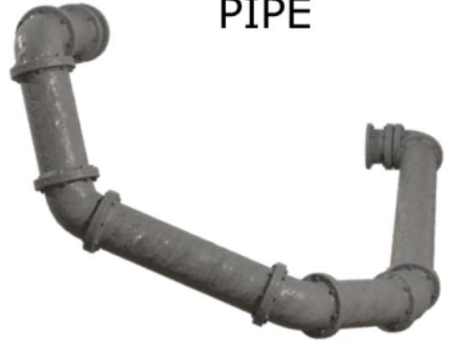


Break Down Problems

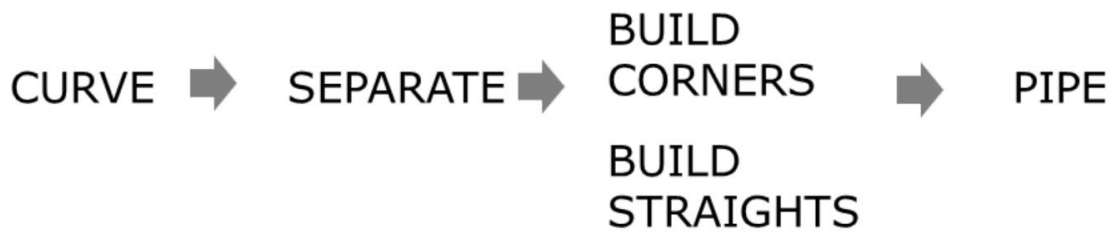
CURVE



PIPE



Break Down Problems

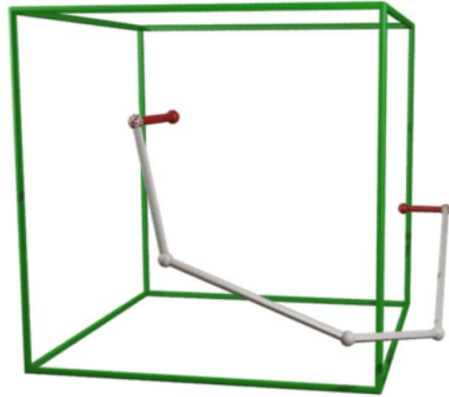




CURVE AS INPUT

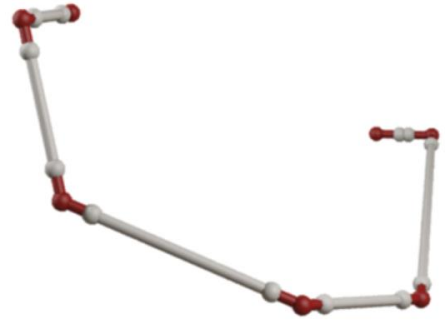


BONUS: PROJECT EXTRA POINTS

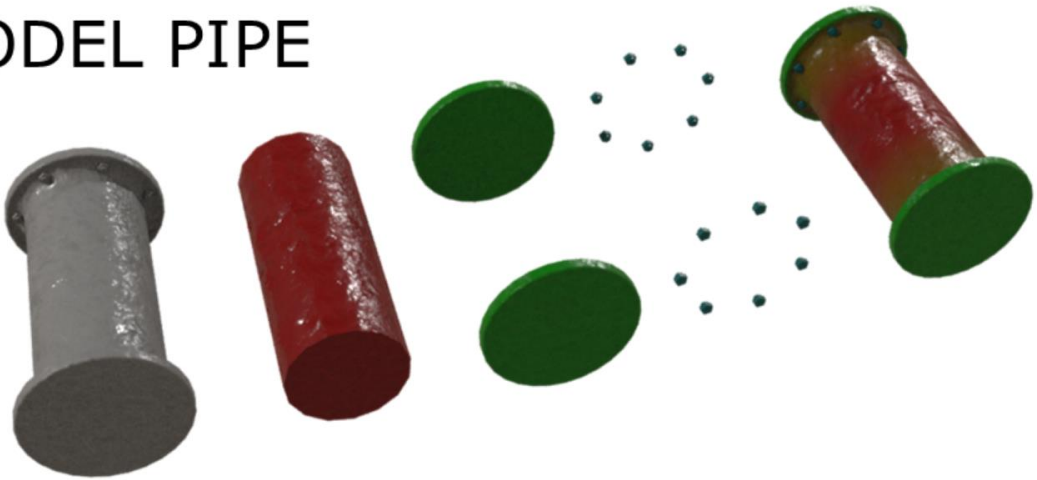




SEPARATE STRAIGHT/CORNERS



MODEL PIPE





PLACE STRAIGHTS





BUILD CORNERS



DONE!



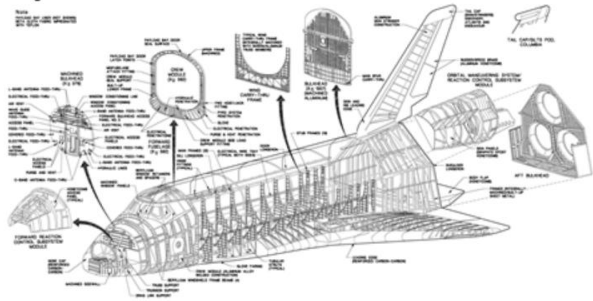
Level 3 – Teamwide Deployment



Producers and Managers
How come we're not doing that?
Buzzword Factor

How To Develop Large Tools

Interconnected Sub Systems
Critical Path



HOW DISTRIBUTE AND FOSTER PROCEDURALISM IN YOUR STUDIO

Buy in from different departments
Environments and FX is low hanging fruit
Characters, Concept
Embed workflows into other tools
Case Study, **Modular Set**



Integrate into existing workflows

Iterative Design

Replace Small parts on the pipeline with
the eye on the prize

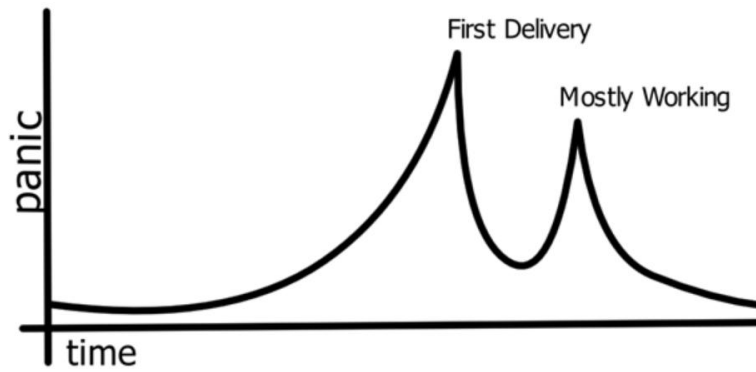


All or Nothing Solutions

"There is no Plan B"
Bold Move...



Panic Threshold



Misconception 4

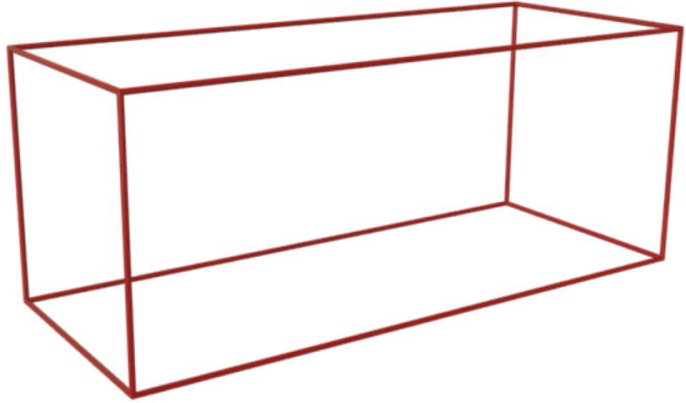
Silver Bullet and Instant Solution
Software development like any other
Bugs, Ambiguity, Bad Inputs
“Off the Shelf”



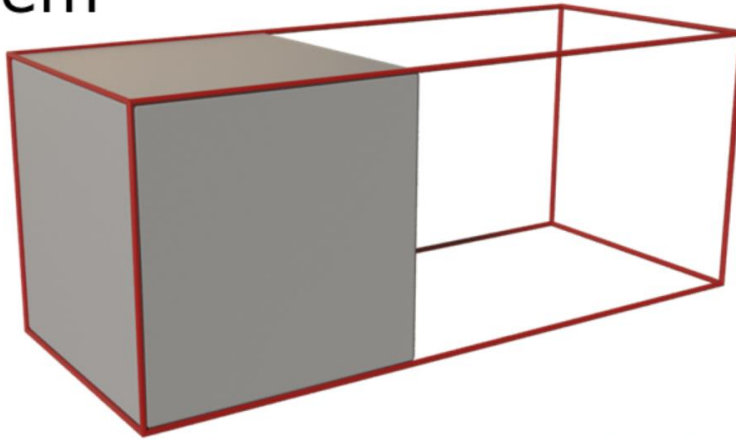
Modular Set Example



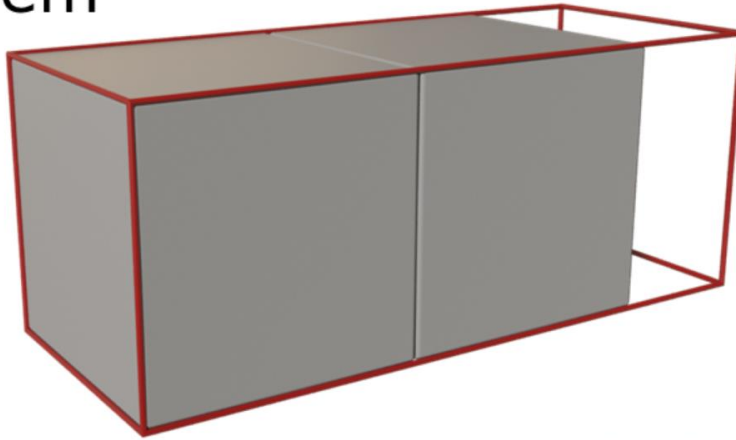
Problem



Problem

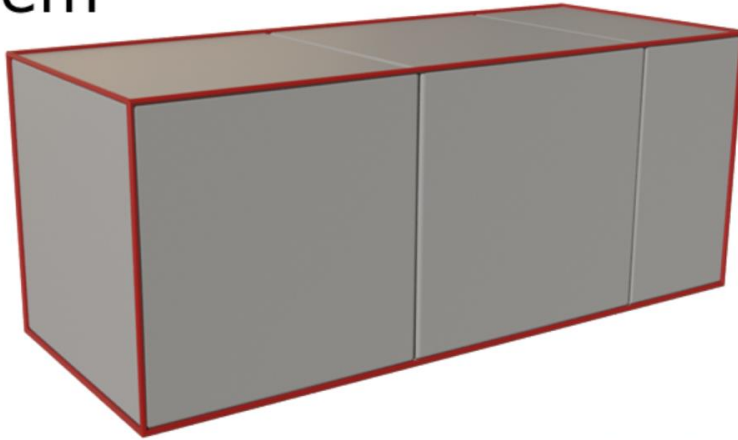


Problem

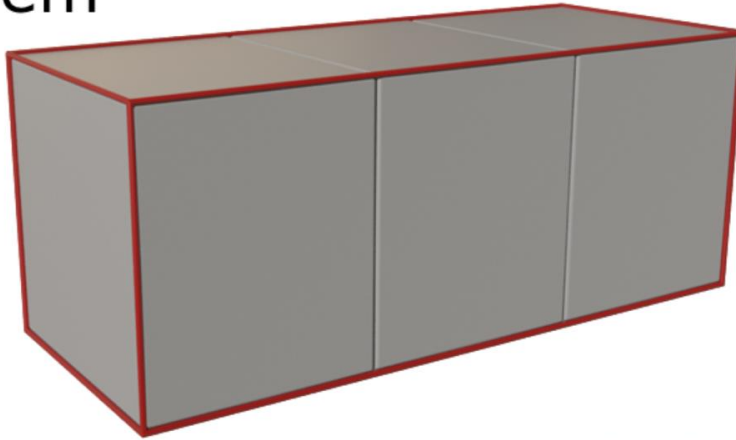




Problem



Problem



Size of Object

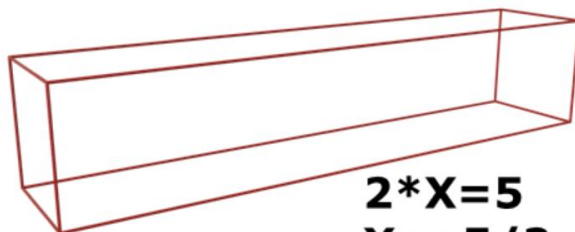
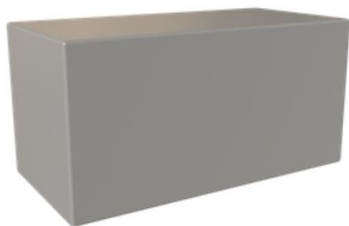
ratio = desired_size/current_size



$$\begin{aligned} 1 * X &= 2 \\ X &= 2/1 \end{aligned}$$

Size of Object

ratio = desired_size/current_size

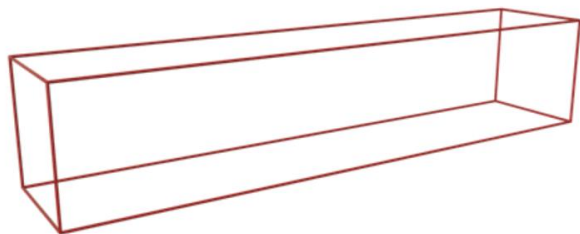


$$\begin{aligned} 2 * X &= 5 \\ X &= 5/2 \end{aligned}$$

Number of Segments

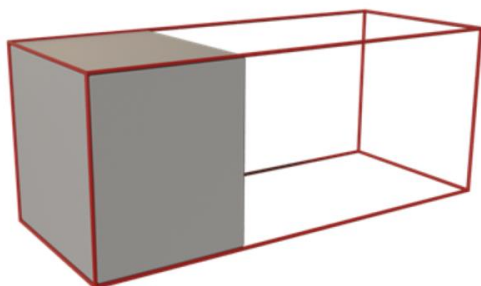
`round(line_size/object_length)`

`floor(5/2)=2`

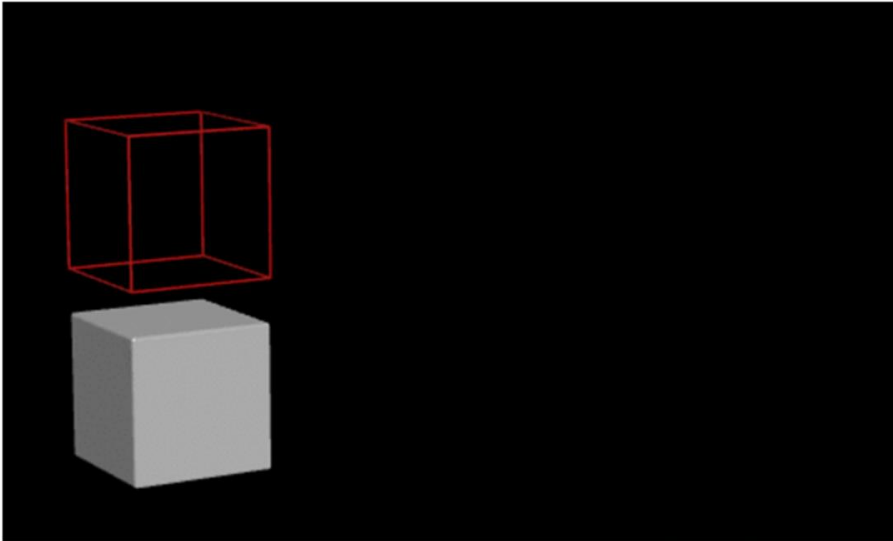


Individual Size

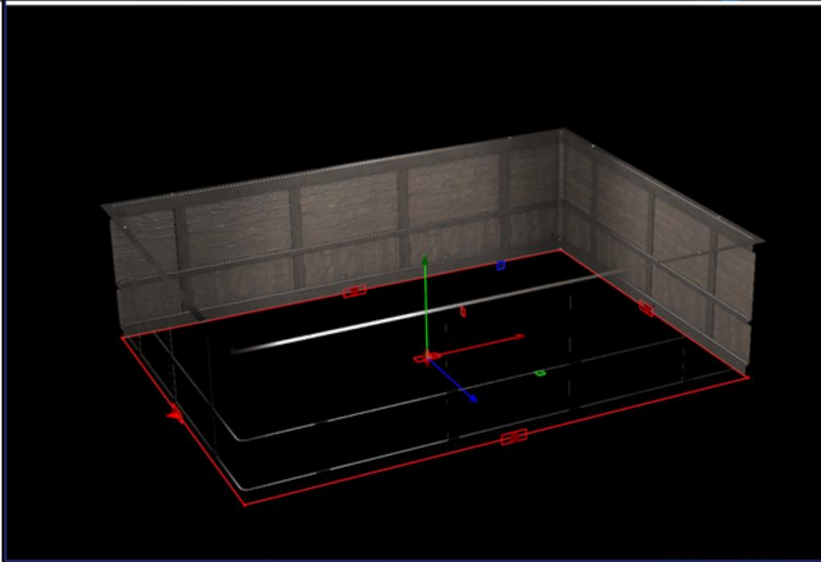
`total_length/number_of_segments`



$$2.5 / 2 = 1.25$$







Hardest Step To Push

Cost

Ego

Pushback





Vertical Monopoly

1 driverless car is great

All driverless cars will allow for new things





PROS

Non Destructive
Automated
Iterative/Parallel

CONS

Longer Ramp up
Perceived loss of control
New and Different





Next Level

Iterate Iterate Iterate

New algorithms

AI Driven Systems



How to keep pushing automation
Where can this go?
How to get to Proceduralism 102?

Come say Hi!

Houdini Training Day | Room 213/214
AMA Conference Center | SF Marriott Marquis

Wednesday Mar 1, 2017

Learn Houdini for the first time or beef up existing Houdini skills! All day Wednesday, SideFX and Pluralsight will be conducting Houdini training sessions. These sessions are open to anyone at the show and seats will be available on a first-come first-served basis. Come learn all about Houdini and walk away with skills you can use forever!



PLURALSIGHT

Session	Instructor	
9:00 AM Intro to Houdini	John Moncrief	Pluralsight
10:00 AM Houdini 16 for Games	Scott Keating	SideFX
11:00 AM Terrain Generation	Alex Dracott	SideFX
12:00 PM Houdini 16 Game Tool Shelf	Luiz Kruei	SideFX
1:00 PM Houdini and the VR Fight Pit	Mike Mundock	SideFX
2:00 PM Herding Rocks in Shape Of The World	Michael Lyndon	
3:00 PM Multi-Platform 3D Art Unity	Luis Garcia	Feline Arts
4:00 PM Procedural Assets for UE4	Robert Magee	SideFX

Wednesday March 1	Thursday March 2	Friday March 3
10:00 AM Multi-Platform 3D Art Unity Luis Garcia Feline Arts	Realtime FX Luis Garcia SideFX	Realtime FX Battlefield 1 Robert Magee
11:00 AM Herding Rocks Shape Of The World Michael Lyndon	Ghost Recon Wildlands Robert Magee SideFX	What's New in Houdini 16 Scott Keating SideFX
12:00 PM What's New in Houdini 16 Scott Keating SideFX	Multi-Platform 3D Art Unity Luis Garcia Feline Arts	Procedural Assets for UE4 Robert Magee SideFX
1:00 PM Moku 3 David Clark Orange IS	Procedural Assets for UE4 Robert Magee SideFX	Hair FX in Games Robert Magee
2:00 PM Procedural Assets for UE4 Robert Magee SideFX	Herding Rocks Shape Of The World Michael Lyndon	Realtime FX Luis Garcia SideFX
3:00 PM Castle Defense VR Luis Garcia	Hair FX in Games Robert Magee	Multi-Platform 3D Art Unity Luis Garcia Feline Arts
4:00 PM What's New in Houdini 16 Scott Keating SideFX	What's New in Houdini 16 Scott Keating SideFX	Castle Defense VR Luis Garcia SideFX
5:00 PM Realtime FX Battlefield 1 Robert Magee	Realtime FX Battlefield 1 Robert Magee	
6:00 PM Ghost Recon Wildlands Robert Magee SideFX	Procedural Assets for UE4 Robert Magee SideFX	
7:00 PM Realtime FX Luis Garcia SideFX	Terrain Generation Alex Dracott	
8:00 PM Terrain Generation Alex Dracott	Realtime FX Luis Garcia SideFX	
9:00 PM Castle Defense VR Luis Garcia SideFX	Hair FX in Games Robert Magee	
10:00 PM Procedural Assets for UE4 Robert Magee SideFX	Castle Defense VR Luis Garcia SideFX	



Thanks!

Q&A

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Bonus Round

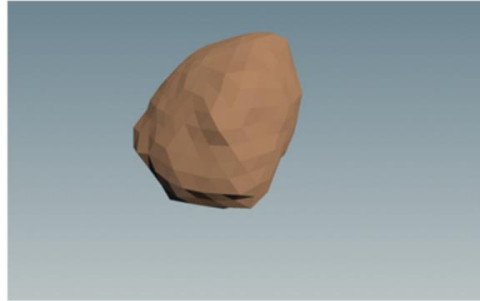
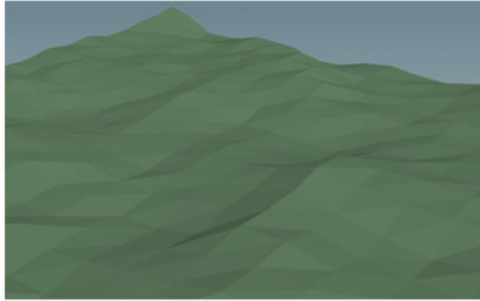
SKIP



Dirt Skirts

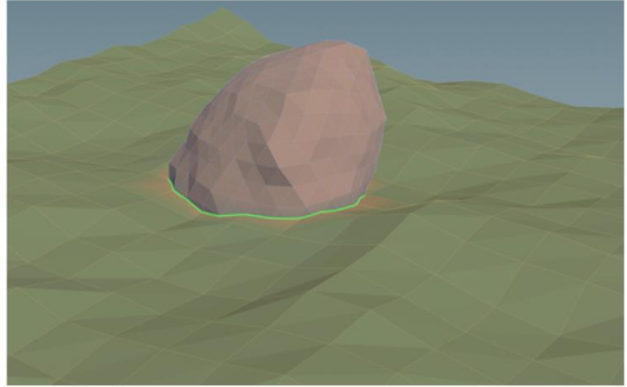


INPUTS



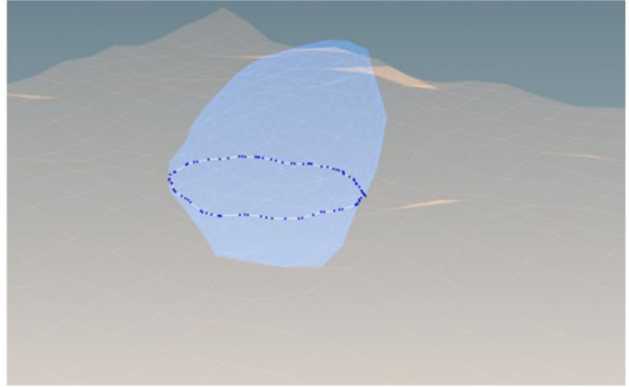


UNION



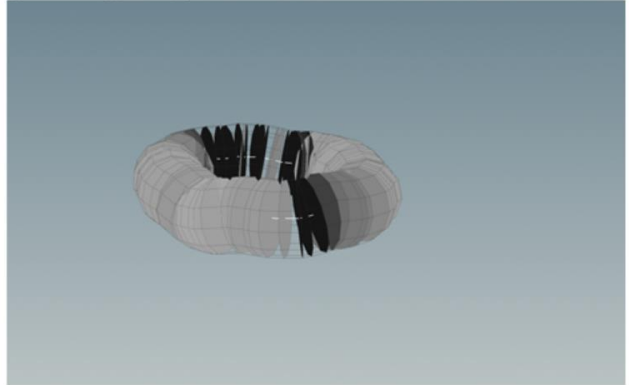


ISOLATE SEAM

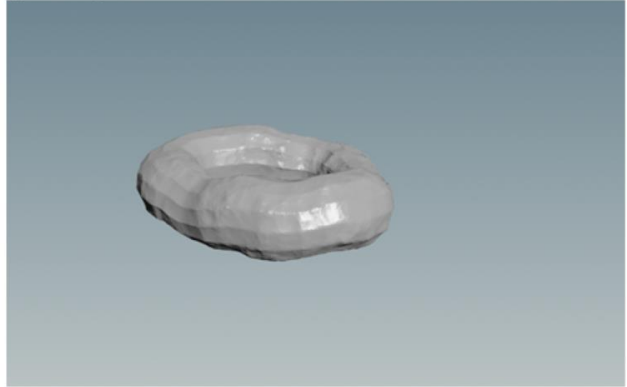




SWEEP GEO ALONG SEAM

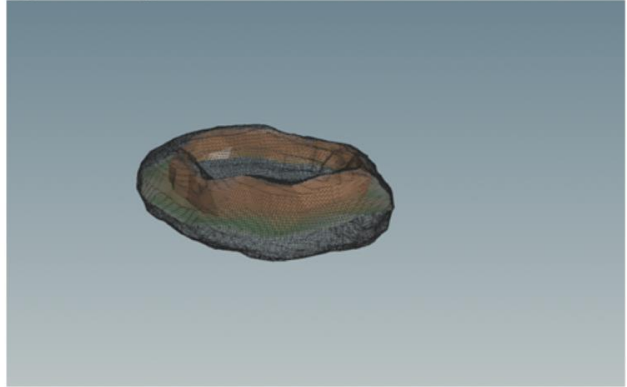


CONVERT TO VOLUME



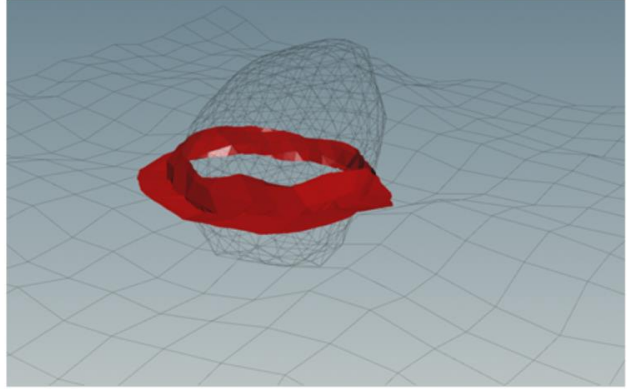


INTERSECT W/ UNION





OFFSET BY NORMAL



ADD VERT ALPHA





ADD UVS





APPLY MATERIAL



