

**TouchDesigner Workshop: realtime visuals for performance
(intermediate level)
13-14 april 2017**

10.00 - 18.00 - maximum 6 participants. Course held in ITALIAN

We will choose together material from the following 4 day program for our 2 day workshop.

Focus on sound reactive visuals and case studies of my work.

TouchDesigner interface basics:

<https://www.derivative.ca/Education/BestWorkshopVideos088/>

Day1 morning

Case study

"Inferometer" music by Nikolay Popov

<https://vimeo.com/199131963>

Animating an image with audio

d1_ex1: analysing audio peaks - analyse CHOP - lag CHOP - moviein TOP - composite TOP
compare pre and post lag values - merge CHOP - trail CHOP

d1_ex2: modulating noise function to animate - noise CHOP - filter CHOP

d1_ex3: modulate an image with noise animated by audio - noise TOP - displace TOP - speed CHOP

d1_ex4: audio animated ripple - ramp TOP - speed CHOP

Converting audio to image

d1_ex5: 2 methods for converting audio to image - chopto TOP - audiospectrum CHOP - displace TOP

Day1 afternoon

component COMP - Panels

in nodes - interface design - perform mode

FPS component

d1_ex6: construct a component that shows FPS and GPU usage - perform CHOP
button COMP - dynamic panel positioning

-create a self contained patch to share - right click on component - save component

Converting audio to geometry

d1_ex7: chopto SOP

3d rendering

d1_ex8: wireframe render of d1_ex7 - camera COMP - light COMP - render TOP

-render as tube - limit SOP

-render as surface - skin SOP - texture SOP -phong MAT

GLSL shaders 1

importing shadertoy GLSL shaders to TouchDesigner

<https://www.shadertoy.com>

Day2 morning

Case study

"ANF-93" music by Nikolay Popov

<https://vimeo.com/109052990>

compositing CHOPs

d2_ex1: revisiting d1_ex7 - compositing noise CHOP and wave CHOP with audiospectrum CHOP
-lookup CHOP - pattern CHOP - explanation of samplerate.

Particles

d2_ex2: we use the audio spectrum as vertical emission velocity for particles - particle SOP

composite fx

d2_ex3: feedback TOP - displace TOP - transform TOP - glitch effects

converting image to geometry

d2_ex4: using an image to displace points on a grid - grid CHOP - topto CHOP - sopto CHOP - chopto SOP
-displace points on an animated cylinder along its normals - tube SOP - switch SOP

Day2 afternoon

pen tool

d2_ex5: track mouse movements to create pen tool - panel CHOP

geo instancing

d2_ex6: record mouse movements and instance geometry - trail CHOP - geometry component:instancing
add attenuated noise - noise CHOP - pattern CHOP
GPU vs. CPU - geo instance vs. copy SOP

d2_ex7: geo vortex - use animated noise to control rotation, ramp to control opacity and colour
- noise CHOP - speed CHOP - ramp TOP - topto CHOP
- GPU transparency in TouchDesigner

importing 3d models

d2_ex8: demonstration of 3d rigging in houdini - export fbx to TouchDesigner

interaction design 1 - leap motion controller

d2_ex9: leapmotion TOP - use leapmotion CHOP channels to animate imported rig

Day3 morning:

interaction design 2 - kinect2

d3_ex1: Paint tool with kinect - skeleton viz patch

case study

“playing with fire” - interactive installation - particle attractor and kinect

<https://vimeo.com/70735873>

d3_ex2: particle attractors tracked to hands - kinect world space/screen space - point SOP-particle SOP

d3_ex3: GLSL shaders – rendering kinect rgb point cloud input

Day3 afternoon

Audio landscape

d3_ex4: audio trail in TOPs – convert to CHOPs then to SOPs as a grid

d3_ex5: same process in CHOPs (more precise) - ‘audio history’ – trail CHOP-shuffle CHOP, chopto SOP
line SOP, skin SOP

Advanced lighting - soft shadows, projection maps

Advanced rendering - PBR (physically based rendering)

d3_ex6: environment light, metallic surfaces, soft reflections - substance shader: shader builder

Python scripting and DATs

d3_ex7: changing keyframe values in a DAT using chop execute DAT

d3_ex8: drag and drop a movie file into a component: container-drag tab

MIDI

Connecting to MIDI devices – keyboards, MIDI controllers

Day4 morning

Geometry and rendering tricks

d4_ex1: tiled wall - fake normals - environment maps-point SOP-primitive SOP

d4_ex2: explode geometry - primitive SOP

d4_ex3: faking reflections-render TOP: render cube map

d4_ex4: more on PBR rendering - metallic, roughness, ambient occlusion

Day4afternoon

case study

“Digital Lighthouse Project” - laser scan for video mapping

<https://vimeo.com/108393131>

video mapping1

kantan mapper - creating masks for projection: mottoKantan.tox

video mapping2

calibrate projector position – camera projection matrix: pallete-tools-Camschnappr

video mapping3

image warp: pallete-tools-stoner component

REFERENCES

python scripting

https://www.derivative.ca/wiki088/index.php?title=Working_with_OPs_in_Python

TUTORIALS

<http://matthewragan.com/category/how-to/touchdesigner/>

<http://matthewragan.com/2014/03/05/touchdesigner-these-are-the-dats-youve-been-looking-for/>

<http://matthewragan.com/2014/03/06/touchdesigner-replicators-and-buttons-and-tables-oh-my/>