TouchDesigner Workshop:
interactive visuals for performance
Intermediate level
25-26 march 2018
ISOLATORWEG 1014 AS Amsterdam

download free version here (Mac or PC):
https://www.derivative.ca/099/Downloads/Default.asp
TouchDesigner interface basics:
https://www.derivative.ca/Education/BestWorkshopVideos088/

Day1 morning

TouchDesigner overview - explanation of operator types, audio input, demonstration of a sound reactive work, use of external tracking devices (leap motion), perform mode (think powerpoint!), interface construction and projector output

Case study
"Leap motion puppet"
using the leap motion controller to animate a digital puppet - ramp is animated by analysing incoming audio signal.

Animating an image with audio

d1_ex1: analysing audio peaks - analyse CHOP - lag CHOP
     compare pre and post lag values - merge CHOP - trail CHOP
     read an image and use audio values to animate- moviein TOP-transform TOP-composite TOP
     Use audio to drive a ramp - speed CHOP
     what is noise? Switch to animate with noise CHOP-switch CHOP
     Collapse selected - create a patch - customize component
     How to customize, *save and share your component*

d1_ex2: using the webcam - videoin TOP
     underwater effect - noise TOP - speed CHOP - displace TOP
     use an animated black and white image to animate time-timemachine TOP
     texture 3d TOP - timemachine TOP

d1_ex3: 2 methods for converting audio to image - chopto TOP - audiospectrum CHOP - displace TOP

d1_ex4: 2 methods for converting audio to geometry - line SOP - chopto SOP - audiospectrum CHOP

Day1 afternoon

Introduction to 3d

d1_ex5: 3d scene - light COMP - camera COMP - render TOP - box SOP
     Lighting - spot lights - projector maps

d1_ex6: importing 3d geometry - leap motion
     animate with audio-sphere SOP-analyze CHOP-logic CHOP-switch TOP
     importing geometry - animating with audio-camera, light COMP-render TOP
     transforming geometry - animate 2 shoes with audio-create floorplane-grid SOP-lighting

d1_ex7: demo of character rigging in houdini-import puppet geometry and animate with mouse
     Panel CHOP - uv coordinates of mouse

leap motion - animate head with leapmotion channels-leapmotion CHOP-leapmotion TOP

Case Study: ANF-93 https://vimeo.com/109052990

Audio Particles

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

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

converting between image, CHOP and geometry (part 2)

d2_ex3: using an image to displace points on a grid - grid CHOP - topto CHOP - sopto CHOP
    displace points on an animated cylinder along its normals - tube SOP - switch SOP

More python

d3_ex4: changing keyframe values in a DAT using chop execute DAT

d4_ex5: create a table of random positions and colors with a python script for random placement of a
    light - Ray SOP - creep SOP - a video mapping trick for making a light travel along a surface.

Case study: "playing with fire" - interactive installation - particle attractor and kinect
https://vimeo.com/70735873

Particles and kinect

d2_ex6: particle attractors tracked to hands - kinect world space/screen space - point SOP
    particle SOP

geo instancing

d2_ex7: instance color from ramp
    Instance color from texture
    instance2 - rotate to normal

d2_ex8: case study https://vimeo.com/229546615
    Point groups and CHOPs

d2_ex9: geo vortex - use animated noise to control rotation, ramp to control opacity and colour
    - noise CHOP - speed CHOP - ramp TOP - topto CHOP
    -opacity - optimization - render pass TOP

GLSL

d2_ex10: Shadertoy importer - how to write a GLSL vertex shader for displacement

d3_ex12: rendering kinect rgb point cloud input

PBR

d2_ex13: into to PRR rendering - soft reflections, ambient occlusion.
    Substance shader - shader writing tool - substanceshader TOP