

# TOUCHDESIGNER WRSHP 101

Experimental Media Art and Design for Beginners

**10:00 – 11:15**

Experimental Media Art & Design : Stefan Kraus

Touchdesigner @ Monomango : Lois Kainhuber

Touchdesigner on Stage : Wieland Hilker

**11:15 – 11:30**

Coffee Break I

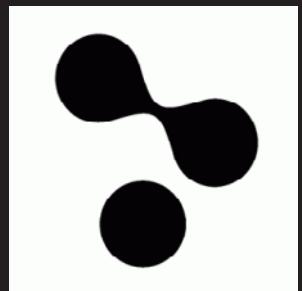
**11:30 – 13:30**

Introducing Touchdesigner

Rendering an animated 3D Scene

**13:30 – 14:30**

Lunchbreak / Pizza & Pasta @ [aldente-berlin.de](http://aldente-berlin.de)



# TOUCHDESIGNER WRSHP 101

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**14:30 – 15:45**

A (very) simple audiovisual synthesizer

**15:45 – 16:00**

Coffee Break II

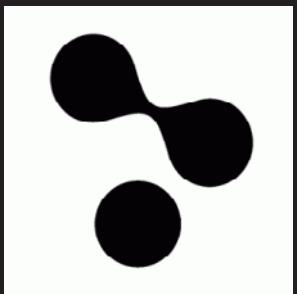
**16:00 – 18:00**

A live Video Mixer with audio driven Effects  
Building an analogue clock with Instancing

**18:00 – 18:30**

Questions and Answers

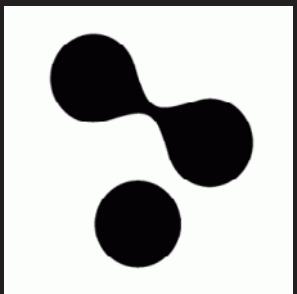
Documents and Files : [https://github.com/MXZEHN/TD-WRSHP-BERLIN-2\\_2019](https://github.com/MXZEHN/TD-WRSHP-BERLIN-2_2019)



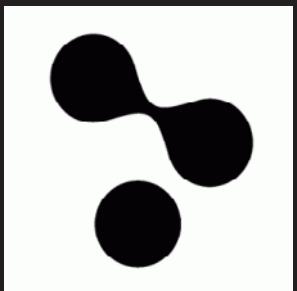
**TOUCHDESIGNER WRSHP 101**

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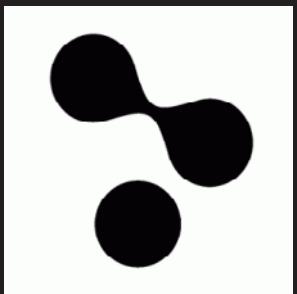
# Experimental Media Art and Design for Beginners



**Media Art explores and  
exploits the narrative po-  
tential of new technolo-  
gies**



Interactive media systems  
can be controlled / perfor-  
med in real time



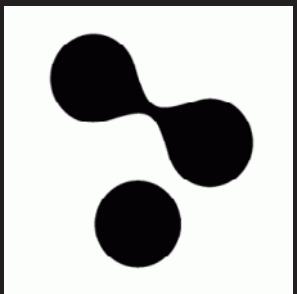
**Media in this sense  
includes everything  
that can be controlled  
by us**

<https://www.whitevoid.com>



<https://www.whitevoid.com>





**Art:**

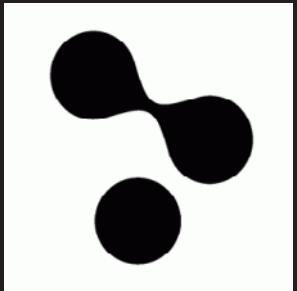
**has no commercial goal but hopes to enlighten through experience**

**Experimental:**

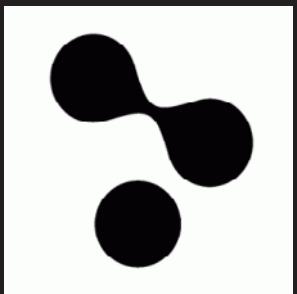
**an open result process of exploration**

**Design:**

**puts the same tools and skills to a commercial use based on a (customers) brief**



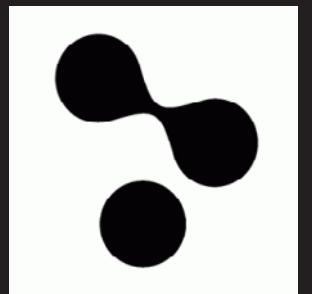
**INPUT  
PROCESS  
OUTPUT**



**TOUCHDESIGNER WRSHP 101**

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# Programming Production Tools Creative Coding



## TOUCHDESIGNER WRSHP 101

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### Creative Coding

Processing / <https://processing.org>

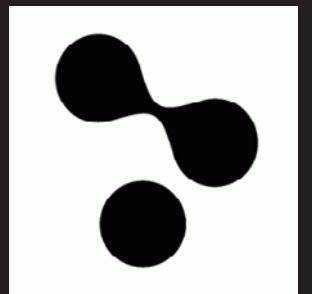
OpenFrameworks (C++) / <https://openframeworks.cc>

Cinder (C++) / <https://libcinder.org/about>

### Game Engines

Unity / <https://unity3d.com>

Unreal / <https://www.unrealengine.com>



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## VJ Software

Resolume / <https://resolume.com>

VDMX / <https://vidvox.net>

Modul8 / <http://www.garagecube.com/modul8>

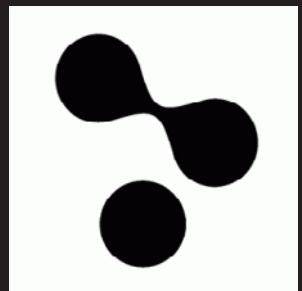
MadMapper / <http://www.garagecube.com/madmapper>

COGE / <https://imimot.com/cogevj>

Millumin / <https://www.millumin.com/v3/index.php>

HeavyM / <https://heavym.net>

SMode / <https://smode.fr>



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## Media Server

D3 / <https://www.disguise.one/en/products>

Pandoras Box / <https://www.coolux.de/de>

Green Hippo / <https://www.green-hippo.com/hippotizer-media-servers>

Wings / <https://avstumpfl.com/en/server-control-systems/software>

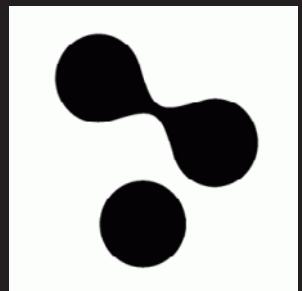
Watchout / <https://www.dataton.com/products/watchout>

## Lighting Hard- & Software

E:cue / <https://www.osram.de/ecue>

Madrix / <https://www.madrix.com>

GrandMA / <https://www.malighting.com/de>



# TOUCHDESIGNER WRSHP 101

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## Node based Programming

VVVV / <https://vvvv.org>

Max+Jitter / <https://cycling74.com/products/max>

Pure Data / <https://puredata.info>

Isadora / <https://troikatronix.com>

Notch / <https://www.notch.one>

Ventuz / <https://www.ventuz.com>

XOD / <https://xod.io>

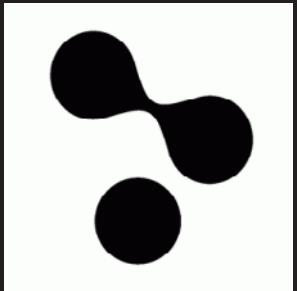
## Nodes in other interesting software

Nodal – Musik / <http://nodalmusic.com>

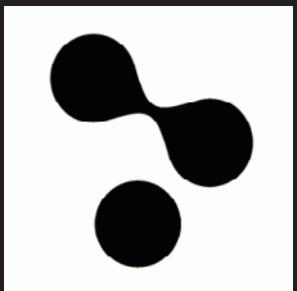
Nuke – Compositing / <https://www.foundry.com/products/nuke>

Houdini – 3D FX / <https://www.sidefx.com/products/houdini>

Substance Designer - Materials / <https://www.allegorithmic.com>



So what about  
Touchdesigner?  
Applications  
& Examples



**TOUCHDESIGNER WRSHP 101**

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**live design & performance**

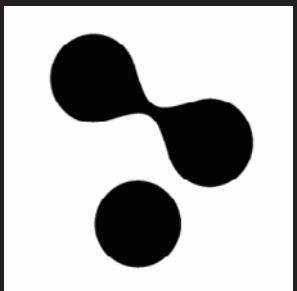
**Show / Concert / Event / Exhibition / Fair / Theater**

**research and development**

**Data Visualisation / Research / Education / Prototyping**

**experimental**

...

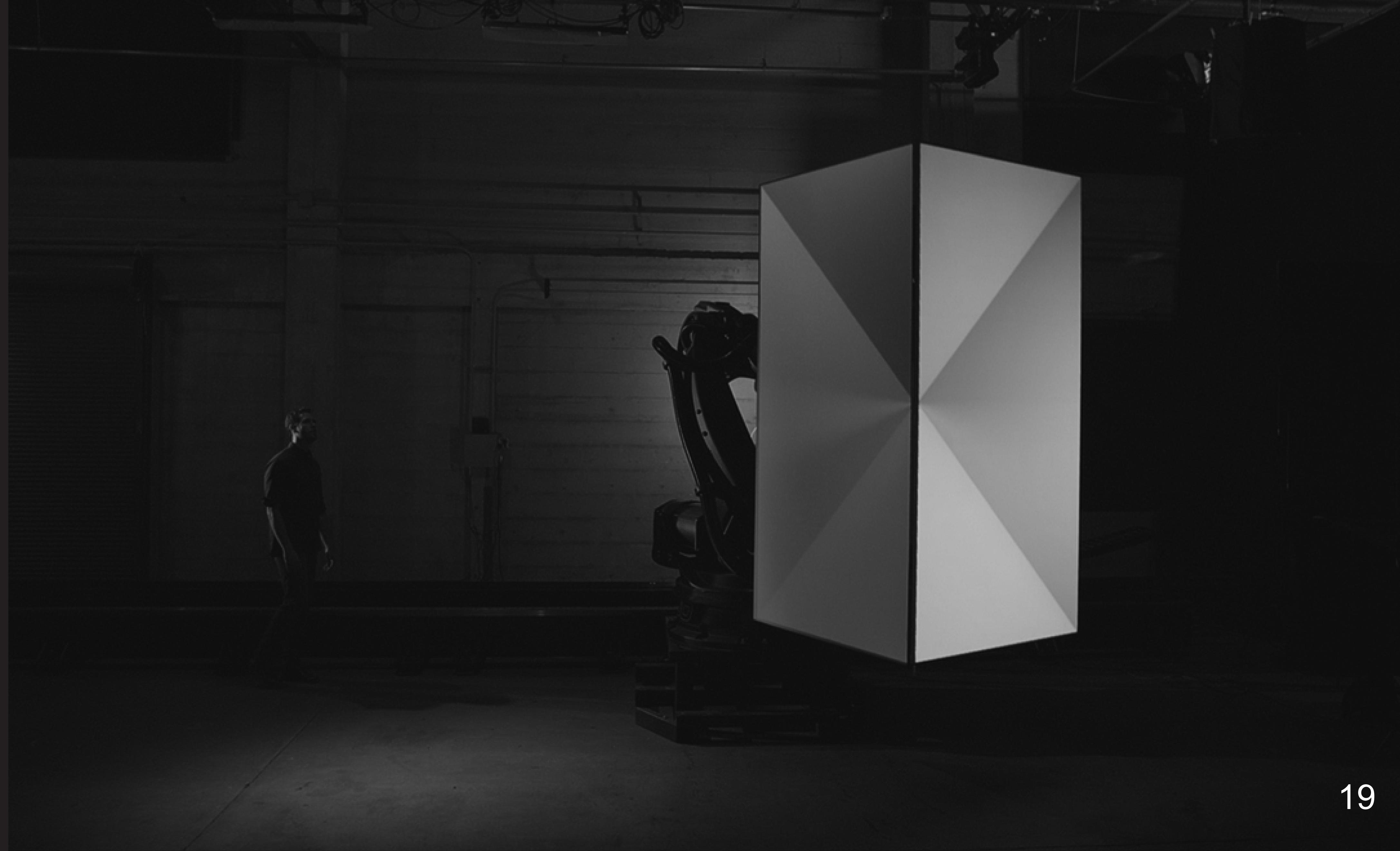


**TOUCHDESIGNER WRSHP 101**

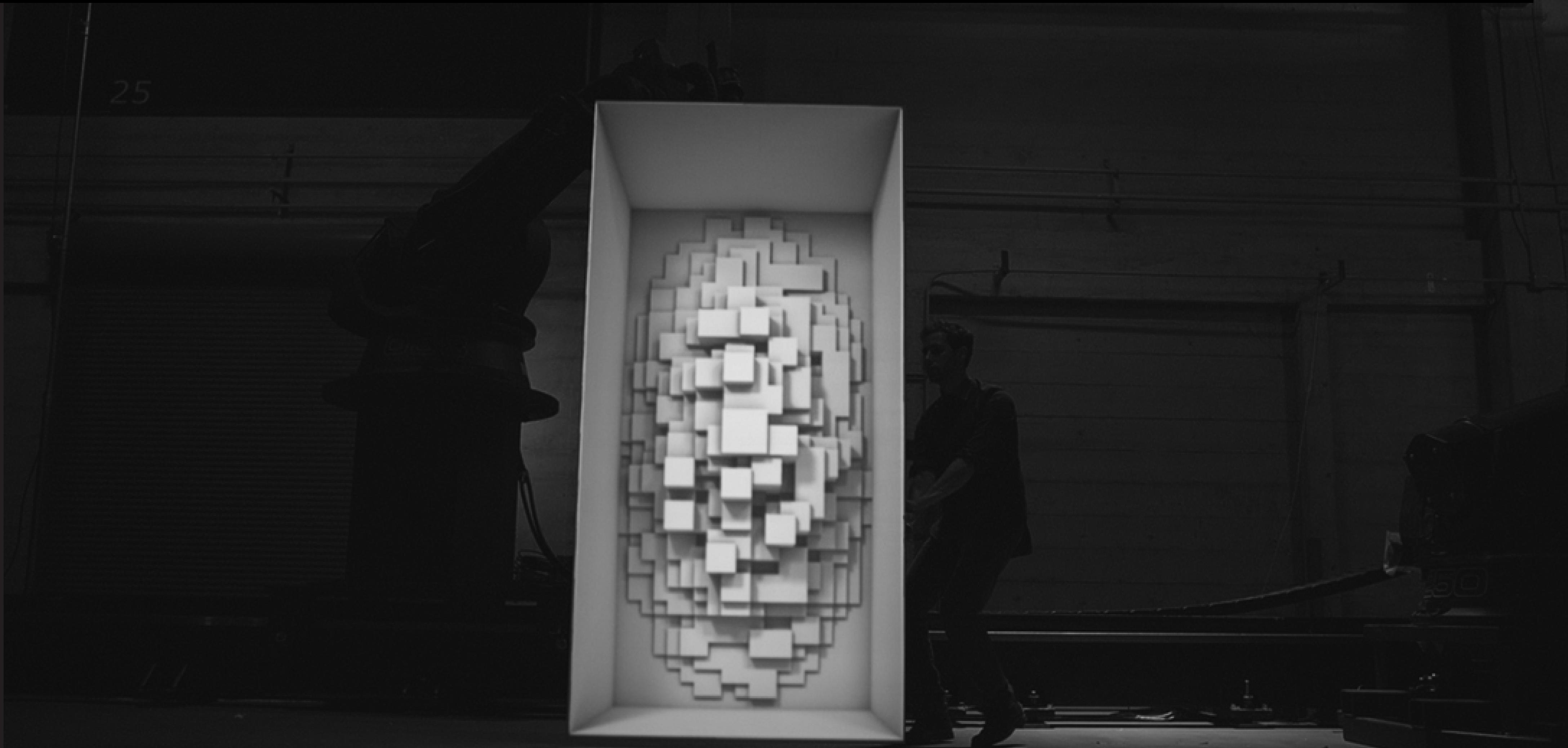
Experimental Media Art and Design for Beginners

**CONNECT  
EVERYTHING  
WITH EVERYTHING**

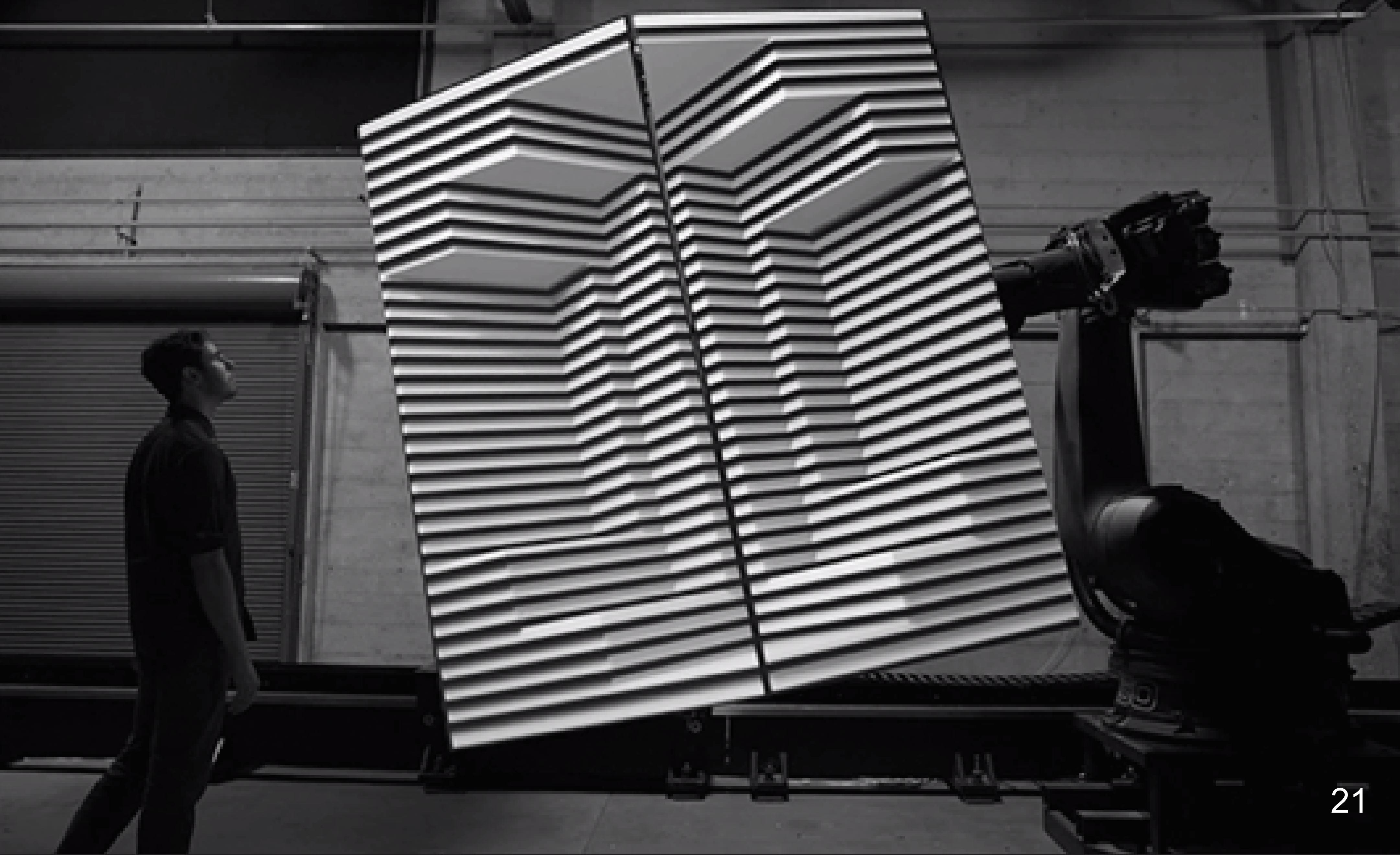
<https://gmunk.com/BOX>

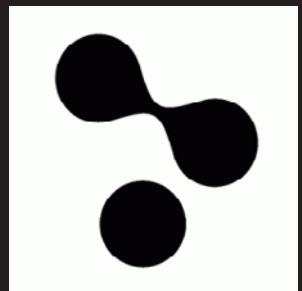


<https://gmunk.com/BOX>



<https://gmunk.com/BOX>





**read, translate and send everything**

**DMX, Artnet, MIDI, OSC, JSON, Serial, TUIO, RS322, Audio, Video, Text, Sheets, Web, Mobile, Light, Ableton, CV**

**build custom applications**

**make your programs private for reselling**

**with a pro license, e.g. GeoPix / <https://www.enviral-design.com>**

**build custom media servers with multiple outputs**

**e.g. Luminosity / <https://github.com/IntentDev/Luminosity>**

<https://www.whitevoid.com>

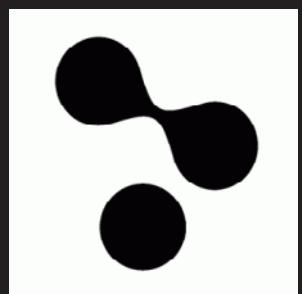


<https://www.whitevoid.com>



<https://www.whitevoid.com>





#### **realtime animation**

**Effects, Motion Design, 3D Animation, Mixing and Routing, Data driven visual content (Music, Data Base, Sheets, Interaction) and Simulations (Physics, Particles) output to wild formats incl. 360°**

#### **lighting & laser design**

**Moving Lights, LED Fixtures, Lasers, LED Sculptures**

#### **virtual & augmented reality**

**prototype VR experiences with VIVE, Oculus, Hololens**

<http://www.soma-cg.com>



<http://www.soma-cg.com>





[https://www.instagram.com/vjrez\\_tokyo/](https://www.instagram.com/vjrez_tokyo/)



[https://www.instagram.com/vjrez\\_tokyo/](https://www.instagram.com/vjrez_tokyo/)

The screenshot displays a complex digital performance software interface, likely for a DJ or VJ setup. The interface is organized into several panels:

- Top Bar:** Initialize, PROJECT, ABOUT, OUTPUT OF, PERFORMANCE, FULLSCREEN, DIRECT PACK, MAP, MAP RELOAD.
- Left Panel:** Contains four main sections: +A1, +A2, +B1, and +B2. Each section includes a preview window, file selection, layer parameters (STYLING, SCALE, ROTATE, POSITION X, POSITION Y), and speed controls (NORMAL SPEED, VAL. 100.00%).
- Middle Panel:** Includes a LAYER PREVIEW window showing a colorful, abstract pattern, and a VIDEO DEVICE IN panel.
- Right Panel:** Features a large preview area showing a grid-based stage with various light panels and a central logo. It also includes sections for EFFECT (with sliders for BRIGHTNESS, GAMMA, CONTRAST, and BLACK LEVEL), BASE FX, EXTENTION (with sub-sections for A, B, C, D, and E), and SPEED / SIDE BOX.
- Bottom Panel:** Shows a grid of visual assets labeled with letters and numbers (e.g., A1, A2, B1, B2, C1, C2, etc.) and descriptions like "Cell is empty".

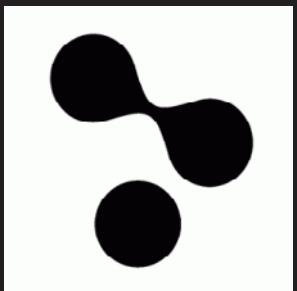
[https://www.instagram.com/vjrez\\_tokyo/](https://www.instagram.com/vjrez_tokyo/)

The screenshot displays a sophisticated VJ software interface with a dark theme. It features several panels and controls:

- Top Bar:** Initialize, Project, About, Output, Performance, Fullscreen, Direct Pack, Map, Map Reload.
- Left Side:**
  - Visuals:** A large grid of 20x10 cells, all labeled "Cell is empty".
  - Layer Preview:** Three preview windows showing a butterfly logo with different color overlays (black, red, green).
- Middle Section:**
  - VIDEO DEVICE IN:** Input settings for video device.
  - EFFECT:** Effect parameters including Brightness, Gamma, Contrast, and Black Level.
  - BASE FX:** Base effect parameters for sides A, B, C, and D.
  - EXTENTION:** Extension parameters for sides A, B, C, and D.
  - SPEED / SIDE BOX:** Speed and side box parameters.
- Right Side:**
  - LAYER PARAMETER:** Layer parameter controls for various layers (A, B, C, D).
  - TIME:** Time-related controls (Time, Render, Sub Map).
  - LEVEL:** Level controls (Multi, Add, Over).
  - CONSOLE:** Console settings (Center Only, Off).
  - REZ NET:** Rez Net settings (On, Off).
  - GRANMASTER:** Granmaster settings (Reverb20 Out, Reverb19 Mono).
  - UNDER CONTROL:** Under control settings.

[https://www.instagram.com/vjrez\\_tokyo/](https://www.instagram.com/vjrez_tokyo/)

The image shows a detailed view of a software application's interface, likely for a video mapping or LED control system. The interface is organized into several panels, each with its own set of controls and visual elements. At the top left, there are four panels labeled '+ A1', '+ A2', '+ B1', and '+ B2', each containing a preview window and various parameters like position, scale, and speed. Below these are two large panels: 'MAIN BANK' and 'SUB BANK', both showing a grid of cells, many of which are labeled 'Cell is empty'. In the center, there are three main preview panels: 'BASE LAYER MIX PREVIEW' (red background), 'MASTER PREVIEW' (orange background), and 'VIDEO DEVICE IN' (green background). To the right, there are several more panels: 'EFFECTS BANK' (blue background), 'MAP PREVIEW' (dark red background), 'PARAMETERS' (purple background), 'EXTRA LAYERS FOR MAP' (dark purple background), 'COLOR CONTROL' (dark blue background), and 'EXTRA LAYER FOR MAP' (dark red background). On the far right, there is a vertical column of settings and status indicators, including 'OPTIONS' (with checkboxes for 'REZ NET', 'SPEED / SIDE BOX', and 'UNDER CONTROL'), 'CONSOLE' (with checkboxes for 'TIME', 'RENDER', 'SUB MAP', 'LEVEL', and 'CONSOLE'), and a section for 'MAPPING' with 'LAYER PARAMETER' and 'COLOR' controls. The overall layout is complex and designed for real-time video processing and control.



### web & mobile interaction

connect to users via the internet

use mobile Apps to control Media Installations

use Web Content in AV Installations

Connect to APIs to gather Data

### tracking

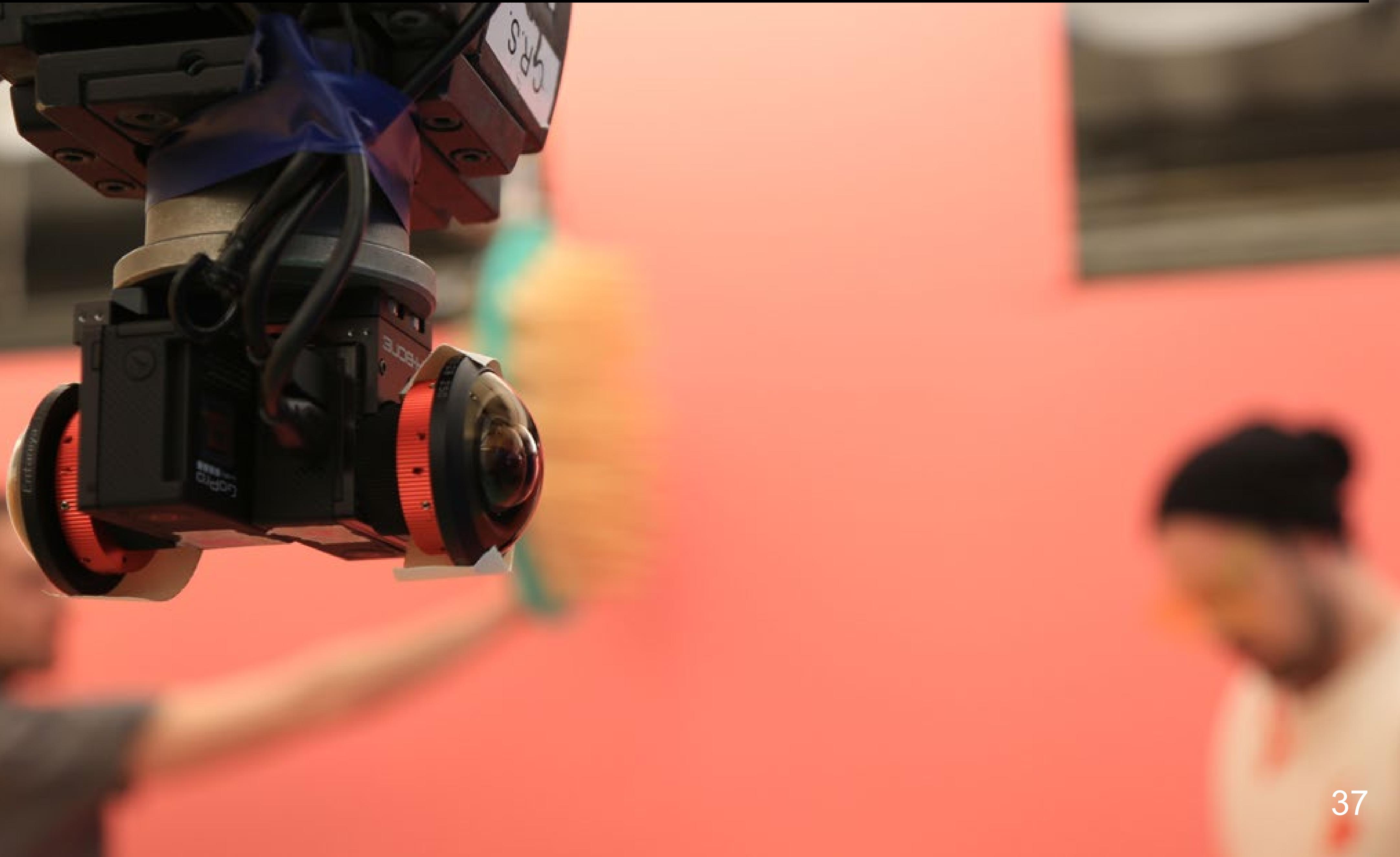
Use Kinect, Intel RealSense, Leap Motion, OpenCV and more to learn about the environment and enable touch free interactions

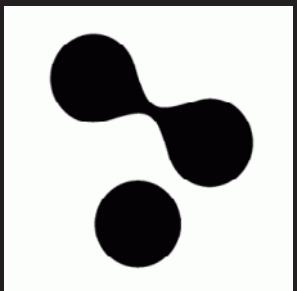
<https://www.derivative.ca/Events/2016/FutureOfMusic>





<https://www.derivative.ca/Events/2016/FutureOfMusic>





**extend the functionality**

**use scripting and coding to extend functionality**

**Shader Authoring (GLSL)**

**scripting in Python allows to use numerous Libraries  
from within Touchdesigner**

**programming custom nodes in C++ (z.B. Vincent Houze)**

**projection mapping**

**keystoning with Stoner**

**creative mapping with Kantan Mapper**

**projector calibration with CamSchnappr**

<https://www.derivative.ca/Events/2015/Luminosity/>



<https://www.derivative.ca/Events/2015/Luminosity/>

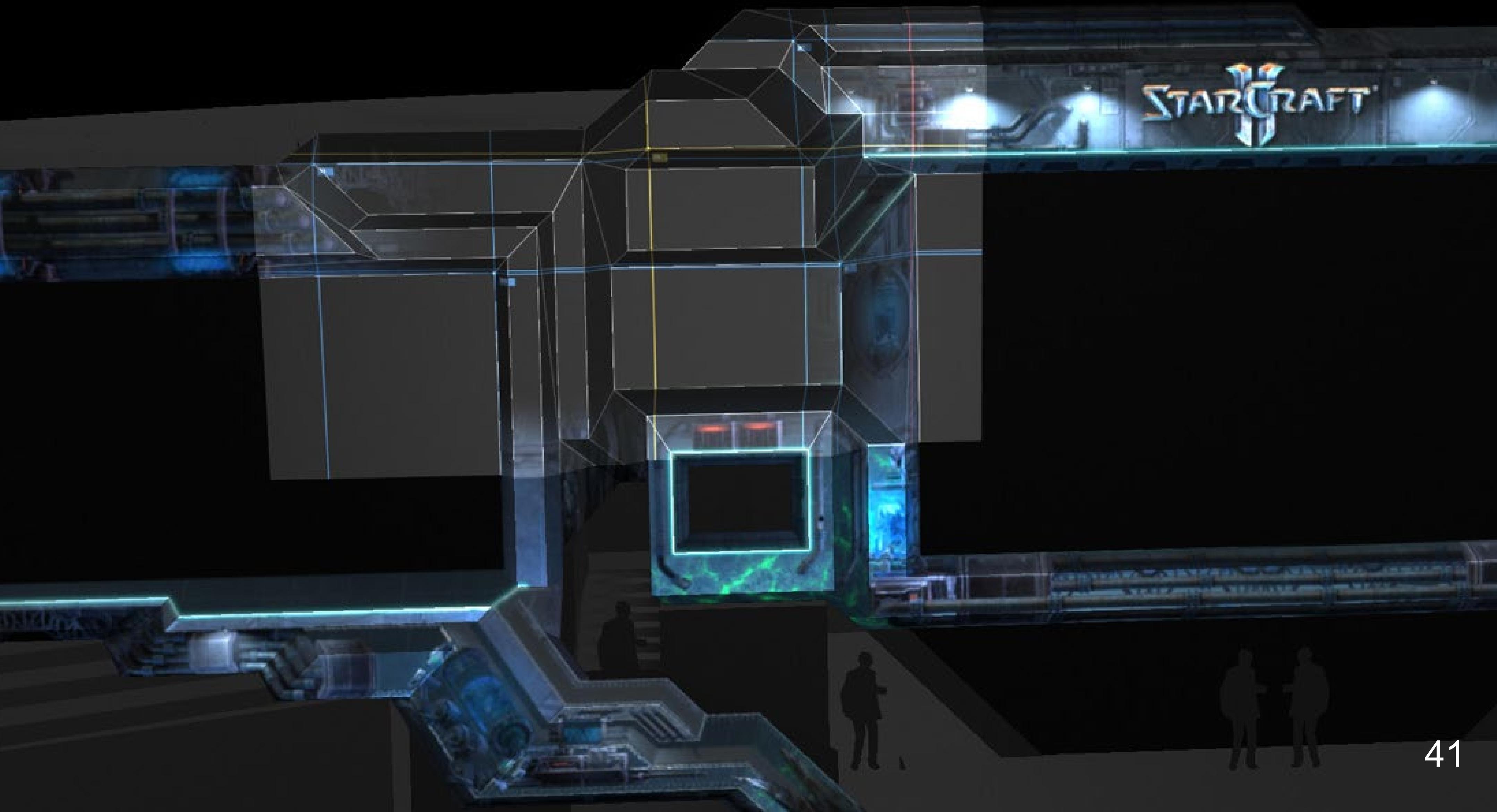
The screenshot displays a sophisticated real-time visual effects (VFX) application interface. At the top, a navigation bar includes 'Map Select', 'Map', 'MIDI', 'OSC', 'DMX', 'Live', 'Master Prev', 'CrossFade', '120 BPM', 'PreLoading', and '158'. The main workspace features a large preview window on the left showing a scene with glowing orange and red energy fields against a dark background. Below this are several control panels:

- Levels:** Includes sliders for 'Pre Key Level On' (M 1.0), 'Pre Key Brightness' (M 1.0), 'Pre Key Gamma' (M 1.0), 'Pre Key Contrast' (M 1.0), 'Pre Key Opacity' (M 1.0), 'Pre Step Size' (M 0.0), 'Pre Step Threshold' (M 0.0), 'Pre Step ClampLow' (M 0.0), 'Pre Step ClampHigh' (M 1.0), and 'Pre Step Soften' (M 0.0).
- Feedback:** Includes sliders for 'Mix' (M 1.0), 'Pre Opacity' (M 0.09), 'Brightness' (M 1.0), 'Opacity' (M 1.0), 'Hue' (M 9.74), 'Saturation' (M 1.04), 'Scale X' (M 0.9), 'Scale Y' (M 0.9), 'Translate X' (M 0.0), 'Translate Y' (M 0.0), and 'Rotate' (M 0.0).
- Strobe:** Includes buttons for 'Trigger' (Qtr 8th 16th), 'Square', 'Smooth', 'Mode', 'Hue', 'Saturation', and 'Value'.

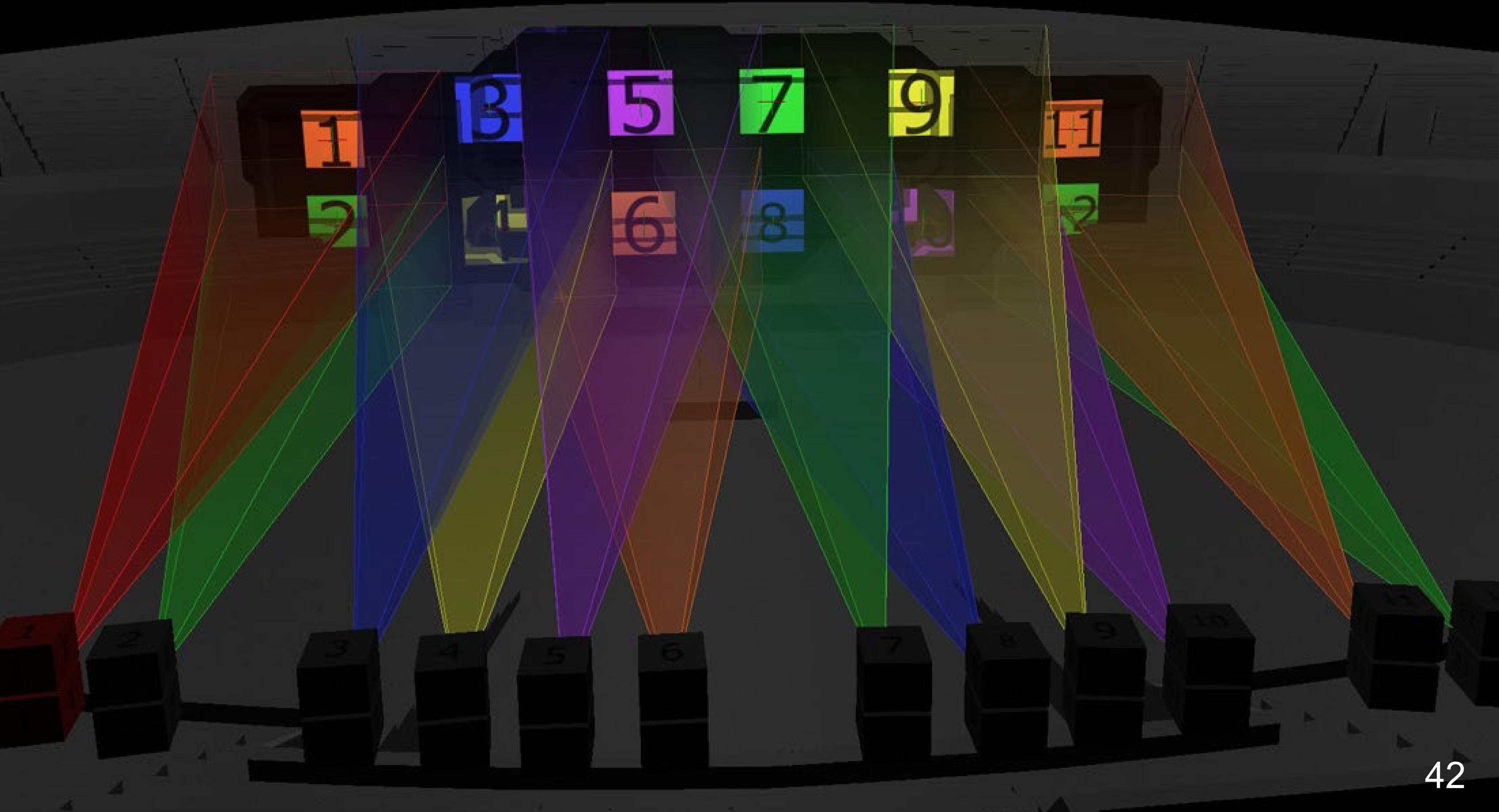
Below these panels is a detailed timeline and clip editor. The timeline at the bottom shows 16 frames labeled 1 through 16. Above the timeline, there are two rows of clip editors for 'Clip 5' and 'Clip 1'. Each row has four columns for 'Inserts' (with options like 'No Effect', 'Levels', 'Over', etc.) and 'Sources' (with dropdown menus for 'None', 'Clip 4', 'Clip 3', etc.). The 'Clip 5' row also includes frame numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16. The 'Clip 1' row includes frame numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16. To the right of the clip editors are sections for 'Aux 2', 'Aux 3', 'Aux 4', and 'Aux 5', each with their own 'Inserts' and 'Sources' controls.

At the very bottom, there are numerous small thumbnail previews of video clips, including 'soTron\_17\_1', 'NepTron\_16\_1', 'Lighter Than Air', 'Video In', 'Particles', 'SacredGeo', 'Curves', 'HeadsUp\_14\_1', 'HeadsUp\_16\_1', 'NepTron\_20\_1', 'HeadsUp\_18\_1', 'HeadsUp\_19\_1', 'HeadsUp\_20\_1', 'NepTron\_19\_1', 'HeadsUp\_22\_1', 'NepTron\_25\_1', 'HeadsUp\_17\_1', 'NepTron\_26\_1', 'NepTron\_27\_1', 'NepTron\_24\_1', 'NepTron\_23\_1', 'HeadsUp\_08', 'HeadsUp\_09', 'HeadsUp\_10\_1', 'HeadsUp\_11\_1', 'HeadsUp\_12\_1', 'NepTron\_28\_1', 'Spherical', 'HeadsUp\_02', 'HeadsUp\_03', 'HeadsUp\_04', 'HeadsUp\_05', 'HeadsUp\_06', 'HeadsUp\_07', and 'HeadsUp\_08'.

<https://www.derivative.ca/Events/2015/Luminosity/>



<https://www.derivative.ca/Events/2015/Luminosity/>



<https://vincenthouze.com>

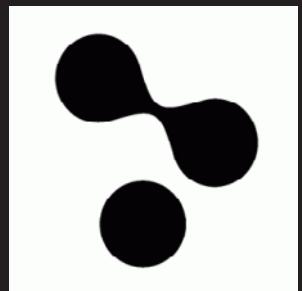
<http://www.daveandgabe.care/projects>



<https://vincenthouze.com>

<http://www.daveandgabe.care/projects>





### what hardware do we need?

PC over MAC

NVIDIA over ATI & INTEL

QUADRO over GTX

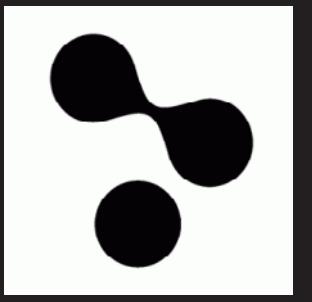
external sound card over internal sound

for video playback

hard disc > memory > CPU > GPU

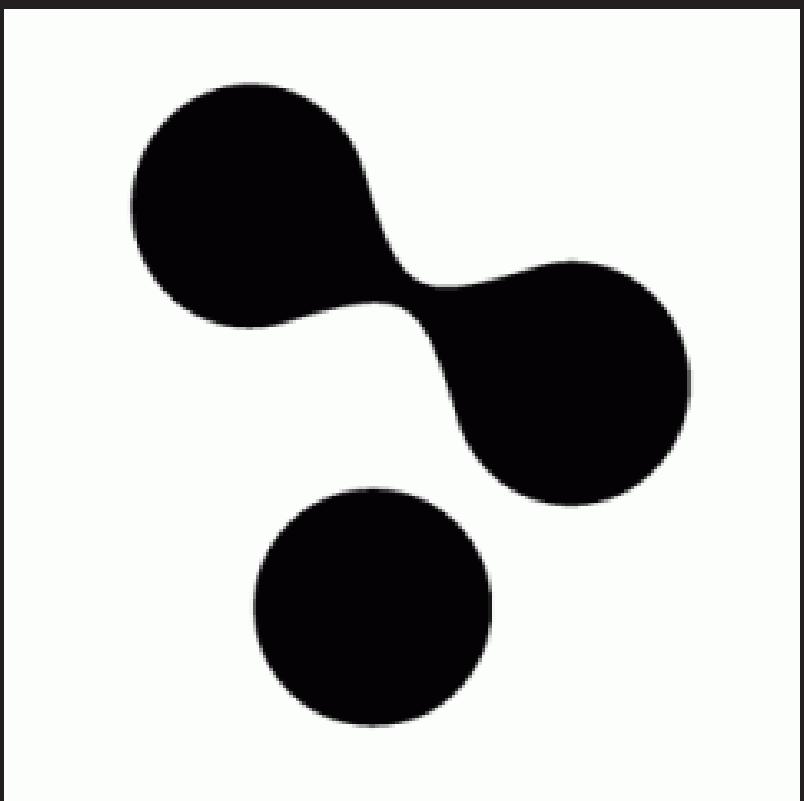
for generative content

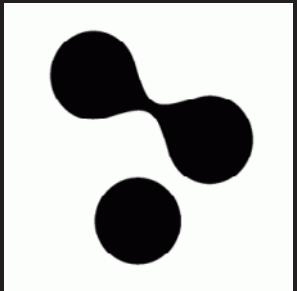
GPU > Memory > CPU



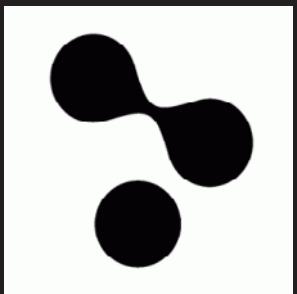
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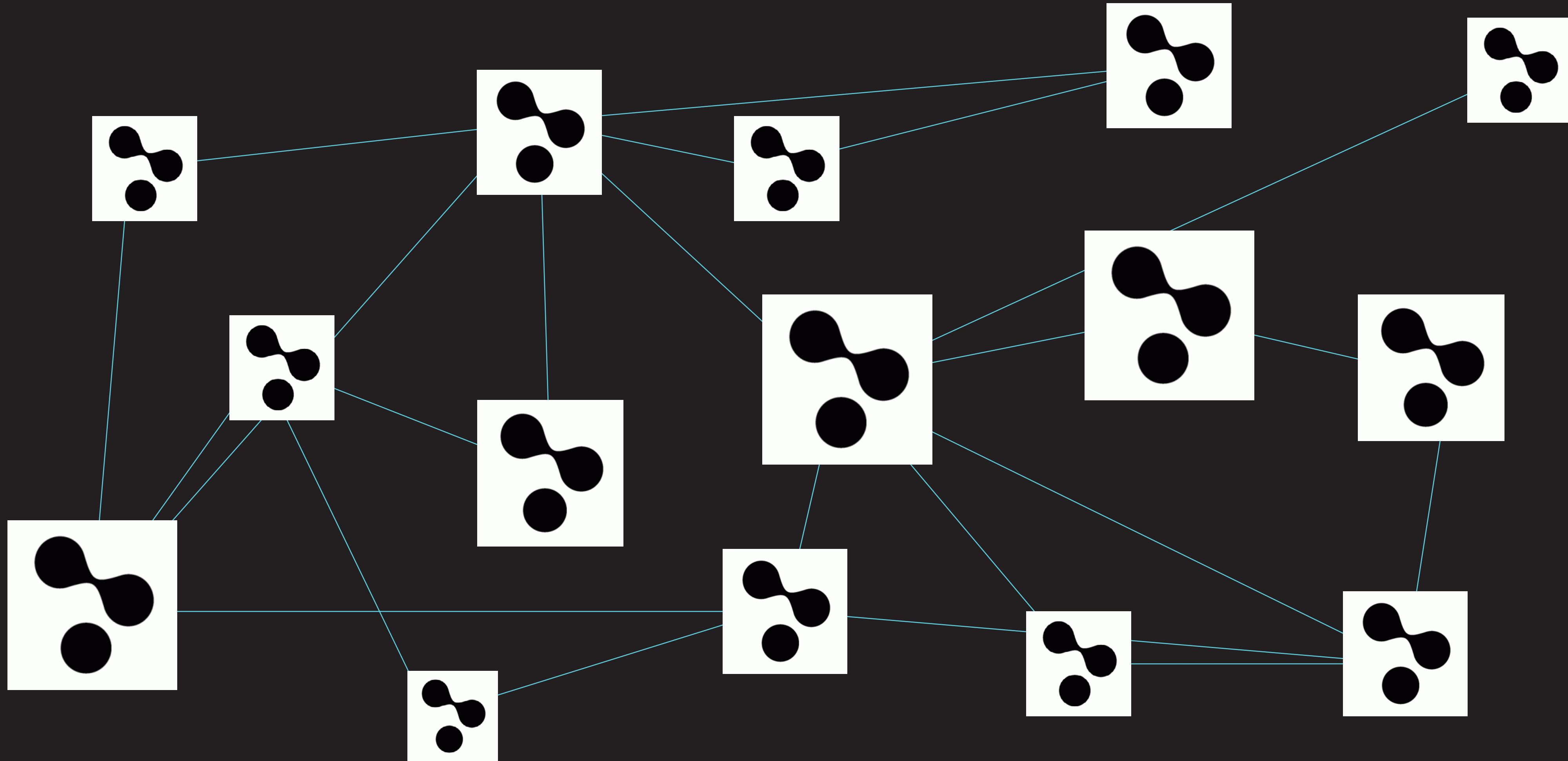


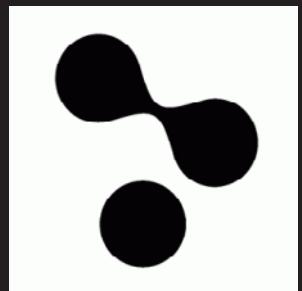
Do not consider  
yourself alone  
warrior Become part  
of a community



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# TOUCHDESIGNER WRSHP 101

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## Free Learning Resources

Matthew Ragan / <https://matthewragan.com/touchdesigner-workshop-yale-2017/>

The WIKI / [https://docs.derivative.ca/Category:Tutorials#First\\_Things\\_to\\_Know\\_about\\_TouchDesigner](https://docs.derivative.ca/Category:Tutorials#First_Things_to_Know_about_TouchDesigner)

## More Learning Resources

Elburz & nVoid / <https://learntouchdesigner.com/>

Lichtpfad Studios / <https://lichtpfad.selz.com/de>

## Where to get help & connect

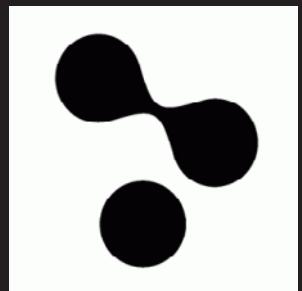
Forum / <http://www.derivative.ca/Forum>

FB Help Group / <https://www.facebook.com/groups/touchdesignerhelp>

TouchDesigner on Discord / <https://discordapp.com>

## More stuff

Elburz Templates / <https://template.elburz.io>



# TOUCHDESIGNER WRSHP 101

## Experimental Media Art and Design for Beginners

### Share Video between Apps:

Syphon / <http://syphon.v002.info>

Spout / <http://spout.zeal.co>

NDI / <https://www.newtek.com/ndi/tools>

### Hardware IO:

Arduino / <https://www.arduino.cc>

Enntec DMX / <https://www.enttec.com>

Datapath FX4 / <https://www.datapath.co.uk>

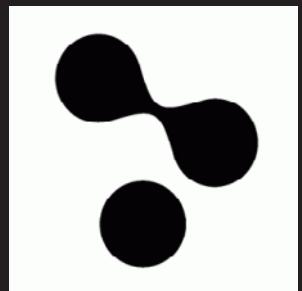
Magewell USB Capture / <https://www.magewell.com/capture/usb-capture>

Wacom / <https://www.wacom.com>

Leap Motion / <https://www.leapmotion.com>

Real Sense / <https://software.intel.com/en-us/realsense/d400>

ZED / <https://www.stereolabs.com/>



# TOUCHDESIGNER WRSHP 101

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## Helpful Software:

Ableton Live / <https://www.ableton.com/de/live>

Audacity / <https://www.audacityteam.org>

Blender / <https://www.blender.org>

OBS / <https://obsproject.com>

Mapping Matter / <http://www.mappingmatter.com>

## OSC / MIDI

TouchOSC / <https://hexler.net/software/touchosc>

Lemur / <https://liine.net/en/products/lemur>

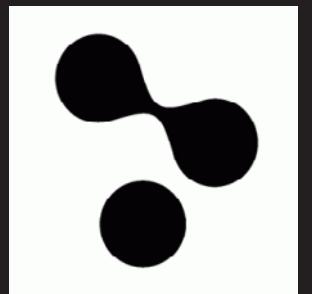
Open Stage Control / <https://osc.ammd.net>

Vezer / <https://imimat.com/vezer>

OSSIA / <https://ossia.io>

RTP Midi / <https://www.tobias-erichsen.de/software/rtpmidi.html>

MIDI Ox / <http://www.midiox.com>



# TOUCHDESIGNER WRSHP 101

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## More stuff

Text Editor / <https://www.sublimetext.com>

BPM / FPS Calculator / [https://www.vjamm.com/support\\_av\\_bpm.php%3Flang=en.html](https://www.vjamm.com/support_av_bpm.php%3Flang=en.html)