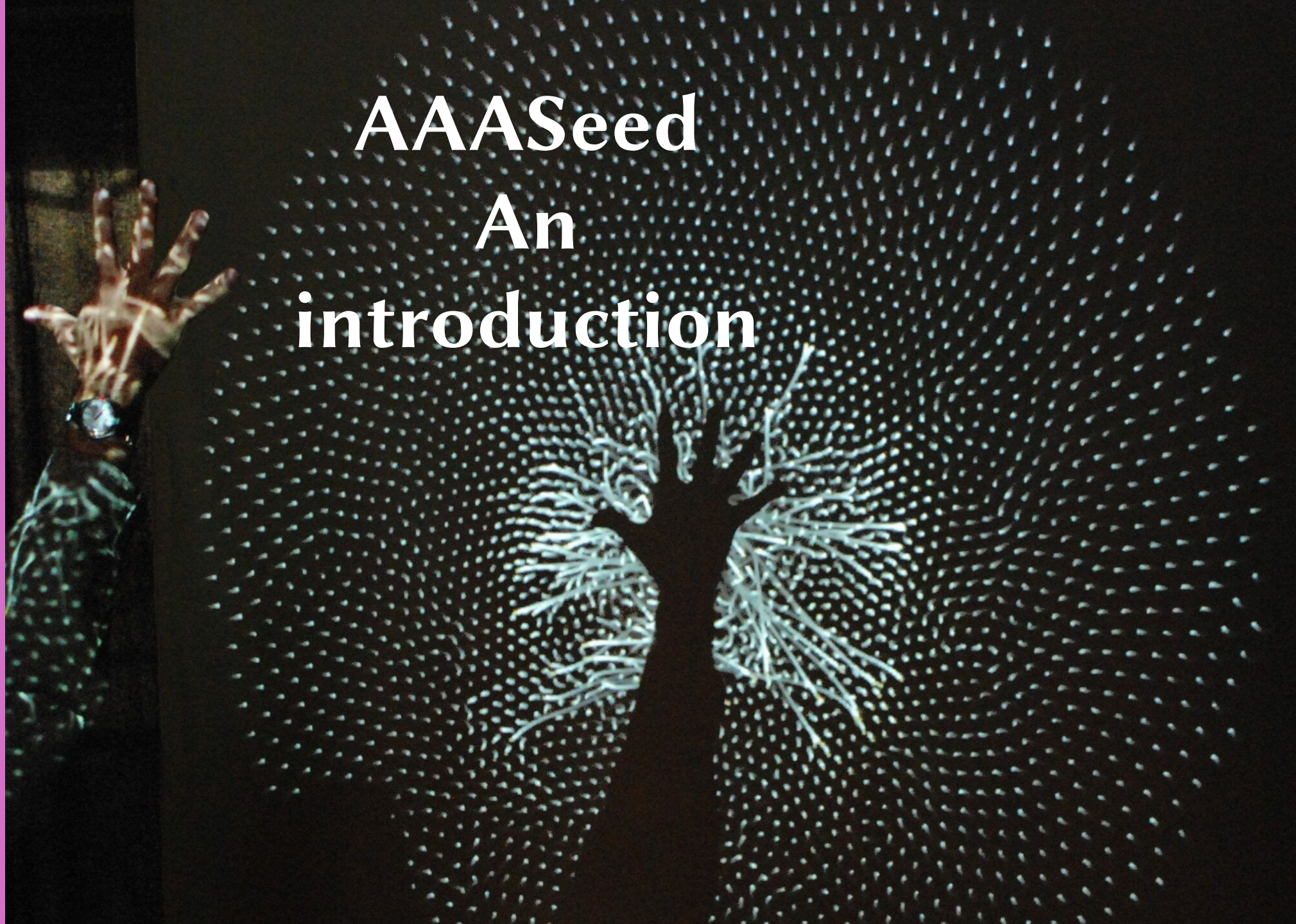


AAASeed

An introduction

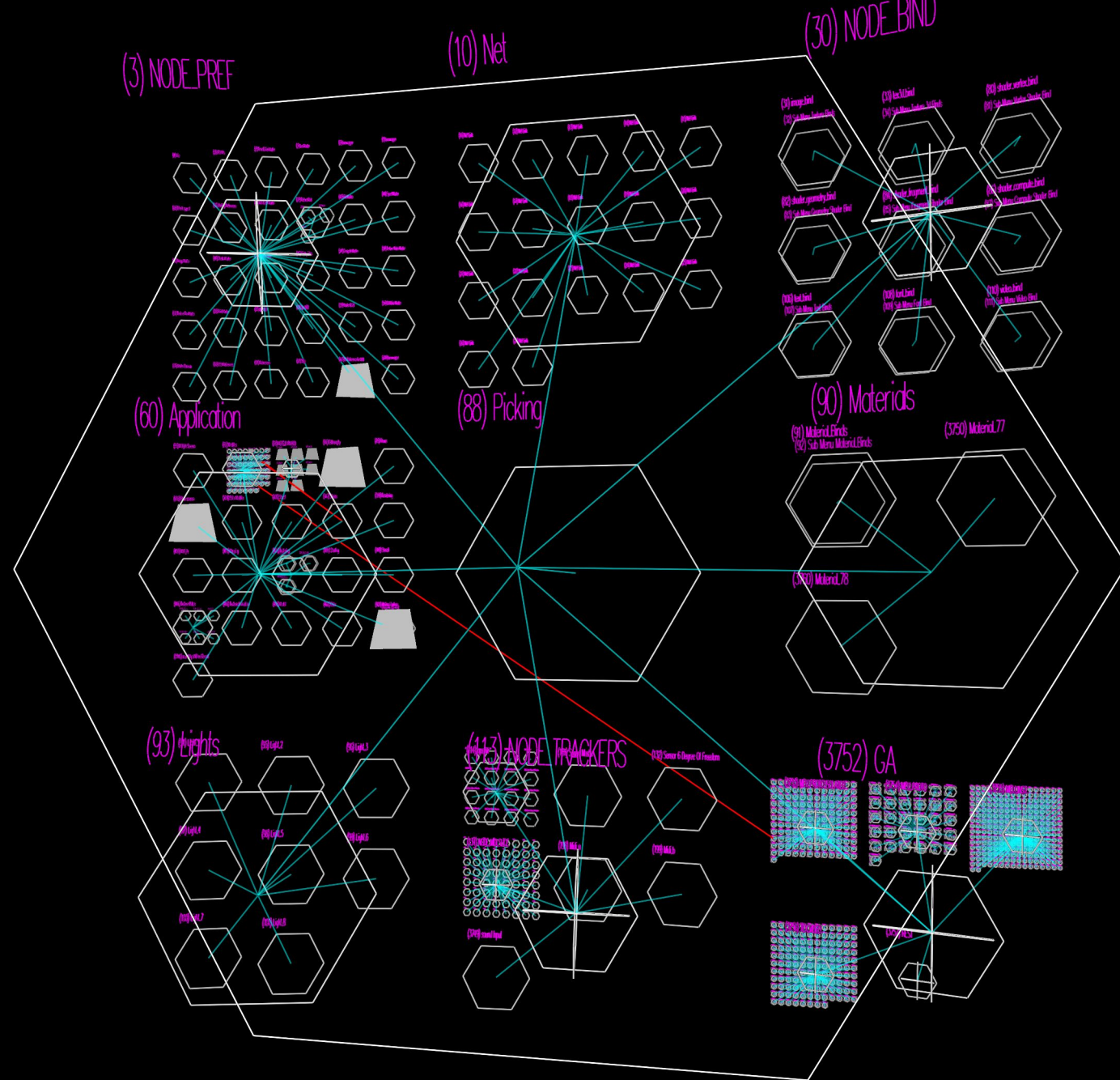


AAASeed

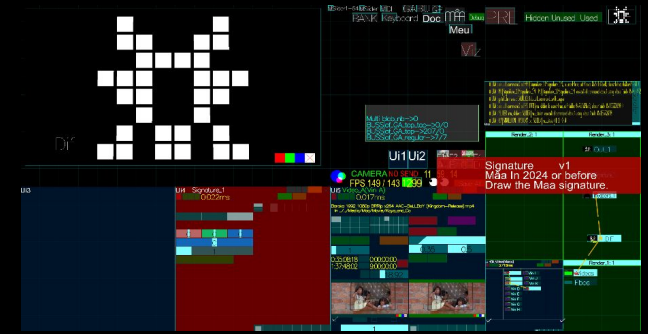
An introduction

Part 1: In the beginning

- What is AAASeed
- Ga Bu Zo Meu



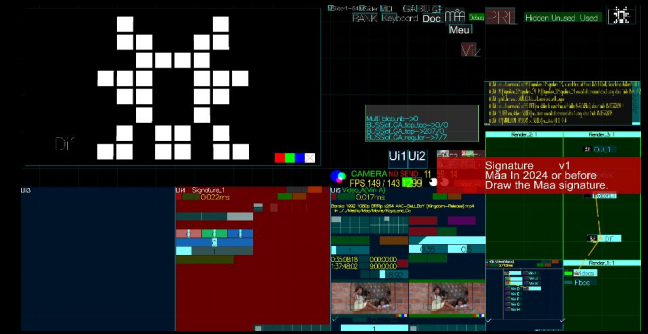
What is AAASeed ?



- A **generic toolkit** for building **real-time** processes
- Designed for:
 - **Video Jockeying & Live Mapping**
 - **Open data** visualization
 - **Interactive Art** installation
- **Open-source** soon (MIT license), **free**
- Created by **Mâa**, with help from **Franz Hildgen**
Refined over **25 years real-world use**
- Stabilized and improved through a European Project (ends September 2025)
<https://ArtCast4d.eu>
Early Adopters Program
- AAASeed is build to last
<https://AAASeed.org>

For whom is AAASeed ?

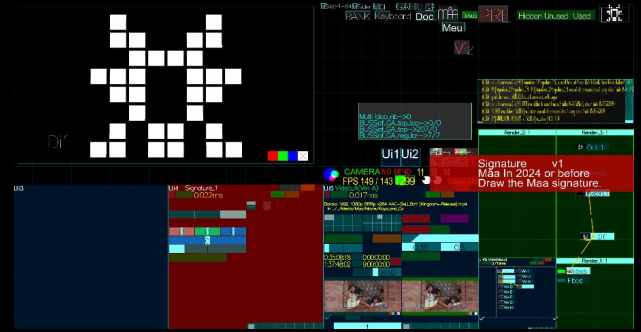
Artist



- **Compose and assemble blocks on the fly.**
- **Most blocks handle graphics processes.**
- **Others manage:**
 - **input** (cameras, sensors)
 - **Image analysis**
 - **Connections between elements**
- **Create live, graphic and interactive outputs.**
- **Free License**
free digital support for generative/interactive artworks.

Who is AAASeed for?

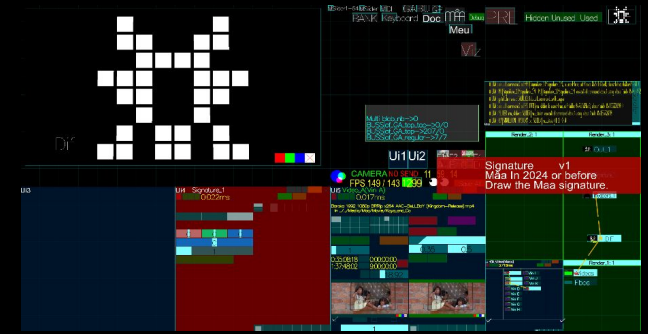
Creative Cultural Industries



- **Video professionals**
Control and display videos, images, and text.
- **Immersive environments**
Multi-screen and multi-machine setups.
- **Works live with existing tools:**
 - **Protocols:** Spout, OSC, MIDI
 - **Software:** TouchDesigner, vvvv, Unity, Unreal, Chataigne, OBS studio...
 - **Sound software:** Max/MSP, Ableton Live, PureData...
- **Use cases:**
 - Dance, Theater
 - TV, Digital signage, Interactive screens
 - You name it
- **Free License**
Keep your budget focused on production.

For whom is AAASeed ?

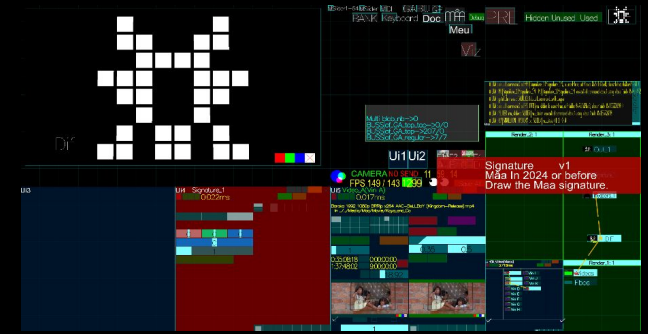
Developer



- On the base of an old school **robust C++ rendering graph** using the **very fast and flexible Lua scripting language** you can access the low level fonctionnality:
Window system, custom C object, OpenGL, C++ objects, Gl Shaders, OpenCl, OpenCV, Nvidia Flex, dlib, bullet, ...
- A rich **lua virtual machine provide** an **interface** to edit and customize realtime processes most of it happen **live** while processes are running **extend and edit on the fly the interface**

For whom is AAASeed ?

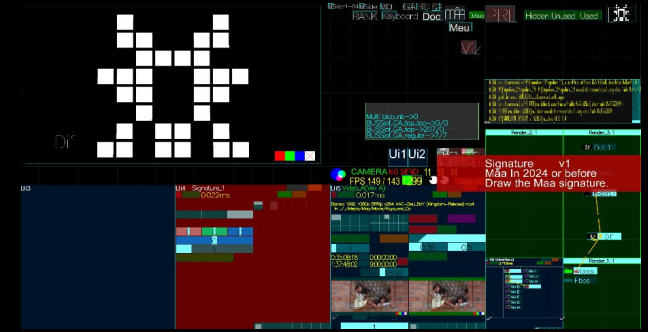
Student, Hobbyist, Teacher



- Have a rich, fast and complete tool to script graphic ideas on the fly
- learn and understand 3d graphics
- experiment and test before going further
- Use shaders
- Live coding
- Teach coding and graphic
- Experiment Mathematics
- An equivalent to processing ?
 - Need probably some graphic primitives to be added
- Infrastructure for research ?

User point of view

- This a **Windows** application for now
AAASeed_Metal.exe
- Tested against **windows 10 and 11**
but should also work on Windows 8,7 even XP.
- It can **run on low end machines**
even an executable for non Avx2 Processor (AAASeed_Wood.exe)
- But it likes fast machines and **uses the Gpu a lot**
Graphic Processor Unit
Loves **NVidia** but functions on integrated Intel
supports **Amd** most of the time (getting better on Amd every month)



Shadoks point of view

"In case of problem just pump"

- talking with the **GA**
Global Action: the top level
- using **BU**
Box User: element of interface
BUS contain one or several BUs
a BU can contain a BUS and so
this way a BU can contain other BUs
- Using **MEU**
Module Editable Unit: functional editable blocks
sometime represented in their short form the **MU**: Module Unit
- We lost the **ZO** but we will find it, promised («On a perdu les ZOs»)
- More on this: search Shadoks on YouTube
 - <https://www.youtube.com/watch?v=SlA57Zw-FN4>
- Thanks to **aaa**production (<https://www.aaaproductio.fr/>)

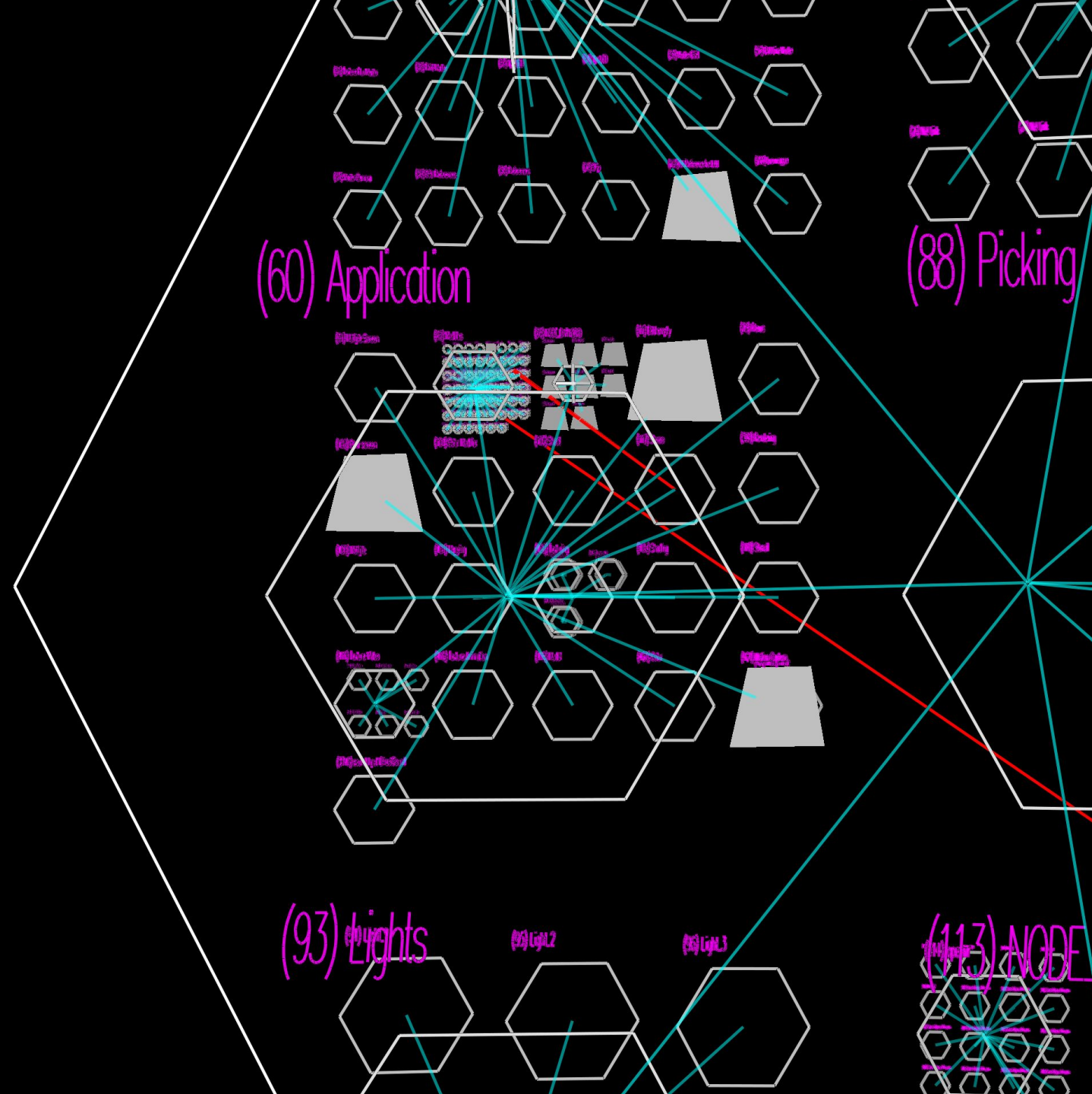


AAASeed

An introduction

Part 2: Install

- Setup AAASeed on your computer
- Folder structure
- AAASeed Sources



Install 1/4: Required software

- **Klite Codecs**

handle decompression of video (AAASeed use it through DirectShow until 2025 September at least)

https://www.codecguide.com/download_kl.htm

we use klite Mega, but other options should function too

installed with default options all the way

- **7z**

handle compression and decompression of 7z files

<https://www.7-zip.org/>

Windows 64-bit x64 version

7z ... -x64.exe : execute to install

- **Visual Studio Code**

text / code editor used by AAASeed by default

NotePad++ and Sublime Text 2/3 were used and should still function

Flatland/Pref/MASTER/Lua/lua_master/editor

<https://code.visualstudio.com/>

Download for windows

Use extensions to color code for lua, GLSL, OpenGL

Use a workspace with the whole AAASeed folder is nice to search and find.

Install 2/4: Other software

- **XnView**

Image browser with batch and conversion capabilities

<https://www.xnview.com/en/>

MP or Classic

- **Wings3d**

3d Editor derived from Symbolics/Nendo.

Nice export tools to .obj files.

<https://www.wings3d.com/>

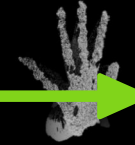
- **Blender**

The Open Source 3d Editor

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

Install 3/4: AAASeed

AAASeed



- Get files from <https://AAASeed.org/files/>
- Use the latest Installer

Install with AAASeed_Setup.1.3.1.exe (2025 April)

Need a Reboot the first Time

Download and add libcurl.dll and cpr.dll to AAADll Folder

No updater for now

Update with the latest AAASeed.7z

- Replace previous AAASeed folder
- You can rename previous and current AAASeed folders
keep different versions if you want

- **Folders**

-AAAFoundation	AAASeed stuff and your work are stored there
-AAADll	Dlls associated (External software libraries), the installer define a system path to it
-AAASeed	What The AAASeed team maintain/update/change, executables are there
-AAASUser	Where your preferences are stored
-APPs_Guest	Where you should save your APPs
-Media	Where you put content (videos, images, sounds...) with sub folder by projects
-Install	Associated installers, drivers...

- It is possible to install from a local drive / USB Key with no Network.

A manual install is possible too

Copying folder and adding the Dlls path to the User or System path)

AAASEED PRODUCTIONS VIDEOS MÅA'S CORNER FILES NEWS CONTACT

FILES

AAASeed Downloads

- [AAASeed_Setup.1.3.1.exe](#)
current installer 2025 April 8th
- [AAASeed.7z](#)
version 2025 April 30th 5pm
- [AAASeed_Introduction.pdf](#)
version 2025 April 30th 5pm
- [Main_x64_2025_April.7z](#)
separate folder with the Dlls from
AAASeed_Setup.1.3.1.exe
- [libcurl_and_cpr.7z](#)
2 Dlls added since the installer AAASeed_Setup.1.3.1.exe

Install 4/4: Multiscreen

AAASeed supports up to 6 screens

On desktop

right click menu

Display Settings item

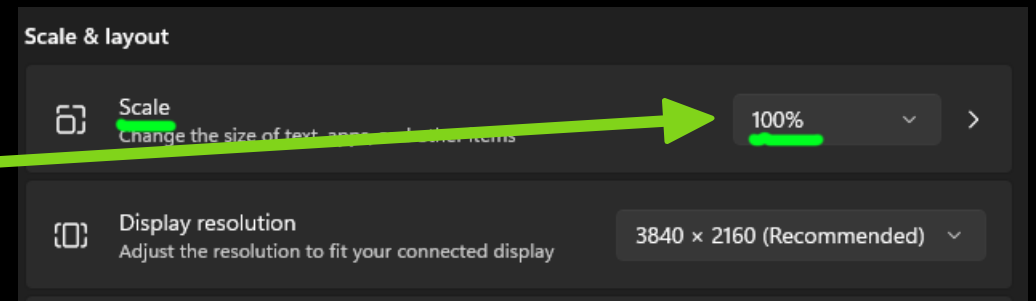
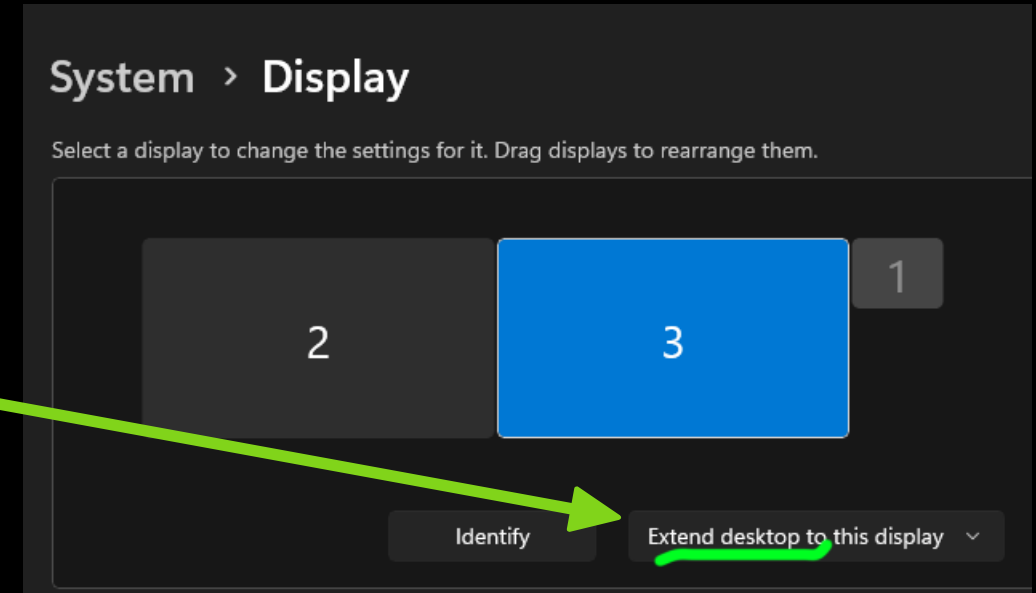
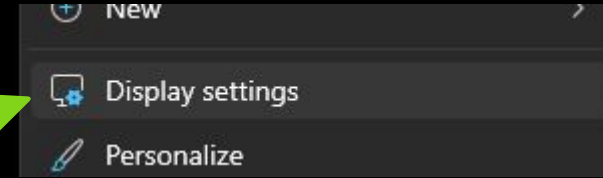
Dialog

- Set **Extend desktop** mode
- Be careful with the **screen alignment**
Horizontal and Vertical
- Choose the **right resolution**

Was mandatory before 2025 May

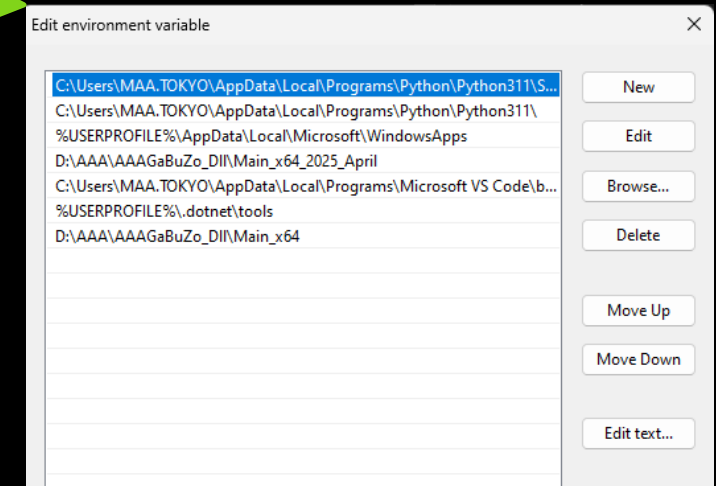
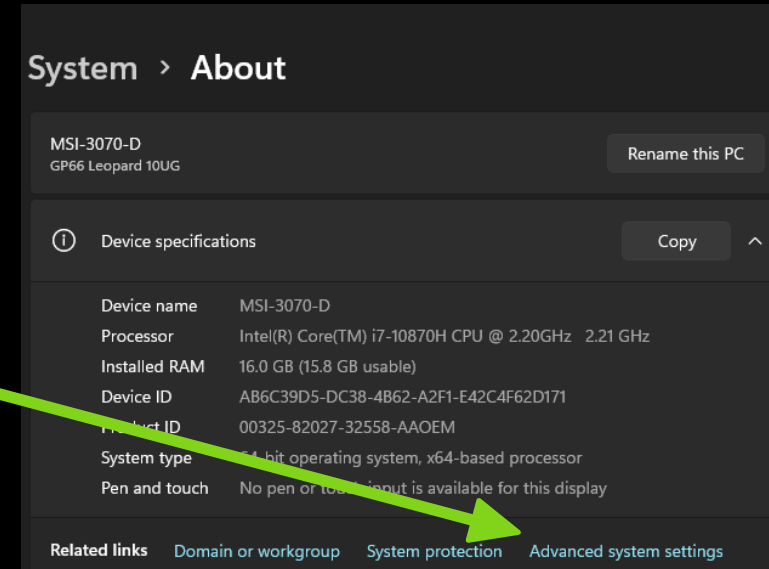
Scale all screens to 100%

seems ok now, testing



Install TroubleShoot (Archive)

- If **AAASeed** complains about missing dll other than VCdll
 - Copy the Dll path from the folder where they are
 - Go to PC / Properties / Advanced system settings
 - Environment Variables
 - Then User variable / Path (User or System) / Edit...
 - New
 - Paste path and eventually change order
 - Validate : Ok then Ok then Ok
 - Launch AAASeed_Metal.exe
- If it still complains about some missing VCdll
 - Execute VC_redist_2015_2022exe
- If it still complains about missing VCOMP120.dll
 - Execute vc_redist_2013_x64.exe



AAASeed Folders: Inside

AAASeed folder name can be changed

- Users use this to keep different versions

We call it the start folder

- in lua aaa.dir.get_dir_start()

This is what we maintain and update

- As User/Guest don't store your stuff here
- For developers: this is the Git repository

2 executables

- AAASeed_Metal.exe
- AAASeed_Wood.exe for machine with no AVX2 Extensions
AAASeed_Metal.exe just crash at start

3 files

- README.md
 - Detail the install and tree structure
 - Document the start sequence
 - Preview in VSCode
- ReleaseNotes.md
 - Document the evolution from version to version
- Version.txt
 - Corresponds to the current version of the installer

AAASeed Folders: Inside more

- AAAAPPs Folder
 - APP is like a document

An App ↔ A **folder** with a file `default.layerss_param` inside
Examples, Tutorials...

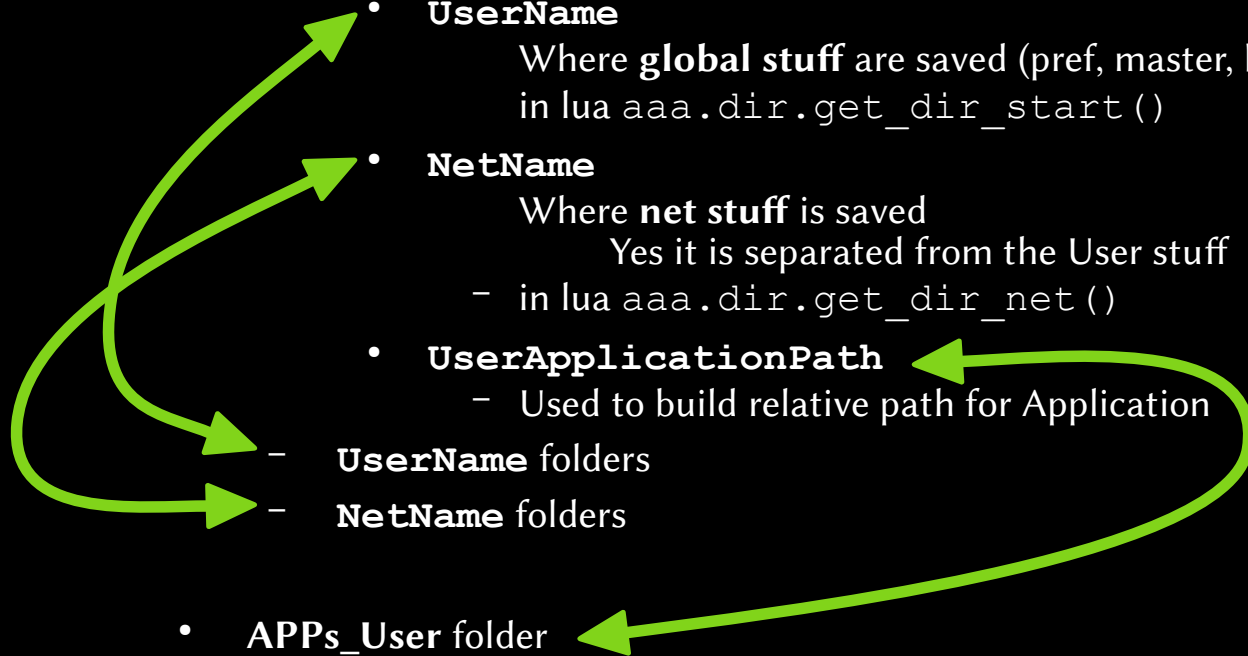
No way to save an APP for the moment: DUPLICATE FOLDER !!!
 - AAAAPPS maintained by the core team
- AAADoc Folder
 - Far from finished (state in 2025 May)
 - Lua API

lua_aaaseed_draw.lua
lua_aaaseed_interface.lua
- AAAKernel Folder
 - Developer space

Some resources: lua code, shaders, OpenCl, Fonts, Textures...
 - in lua `aaa.dir.get_dir_kernel()`

AAASeed Folders: going Up

- AAASeed the Startup folder
- AAAUser folder
 - **AAASeedWho.txt** made of 3 lines:
 - **UserName**
Where **global stuff** are saved (pref, master, binds...)
in lua aaa.dir.get_dir_start()
 - **NetName**
Where **net stuff** is saved
Yes it is separated from the User stuff
 - in lua aaa.dir.get_dir_net()
 - **UserApplicationPath**
- Used to build relative path for Application
 - **UserName** folders
 - **NetName** folders
- **APPs_User** folder
 - **APPs_Guest** by default
 - Your APPs, MEU protos, data, shaders.....
- **Media** folder
 - images, videos, fonts, 3d objects...
 - **Big** files are there



AAASeed Sources

- AAASeed.org

FILES section

- Developer access
git

-AAASeed Folder

-Lua

-APPs

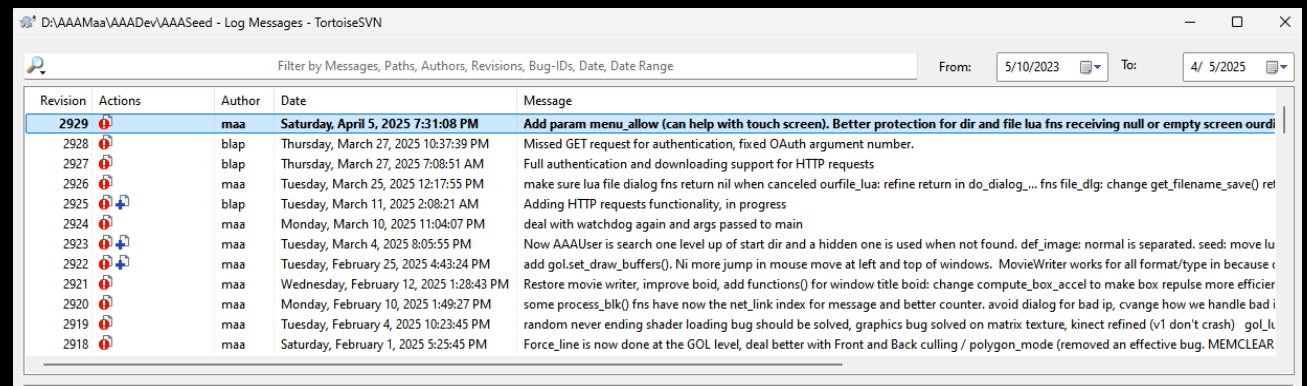
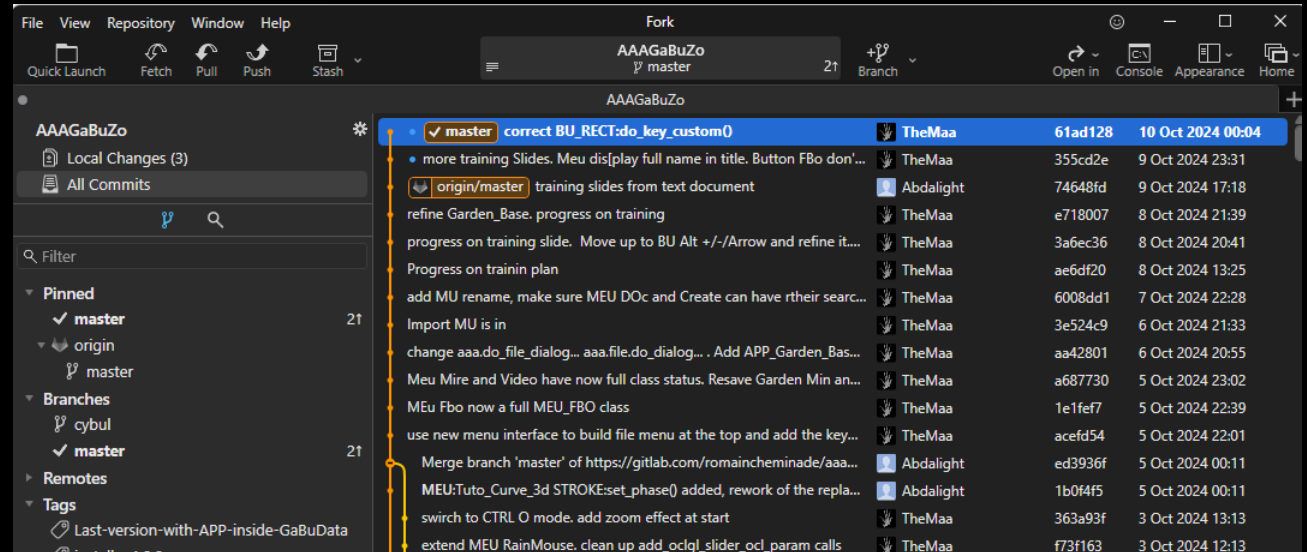
Svn

-AAASeed.exe and dll

-C++

-will move to a git

request Mâa if you want it

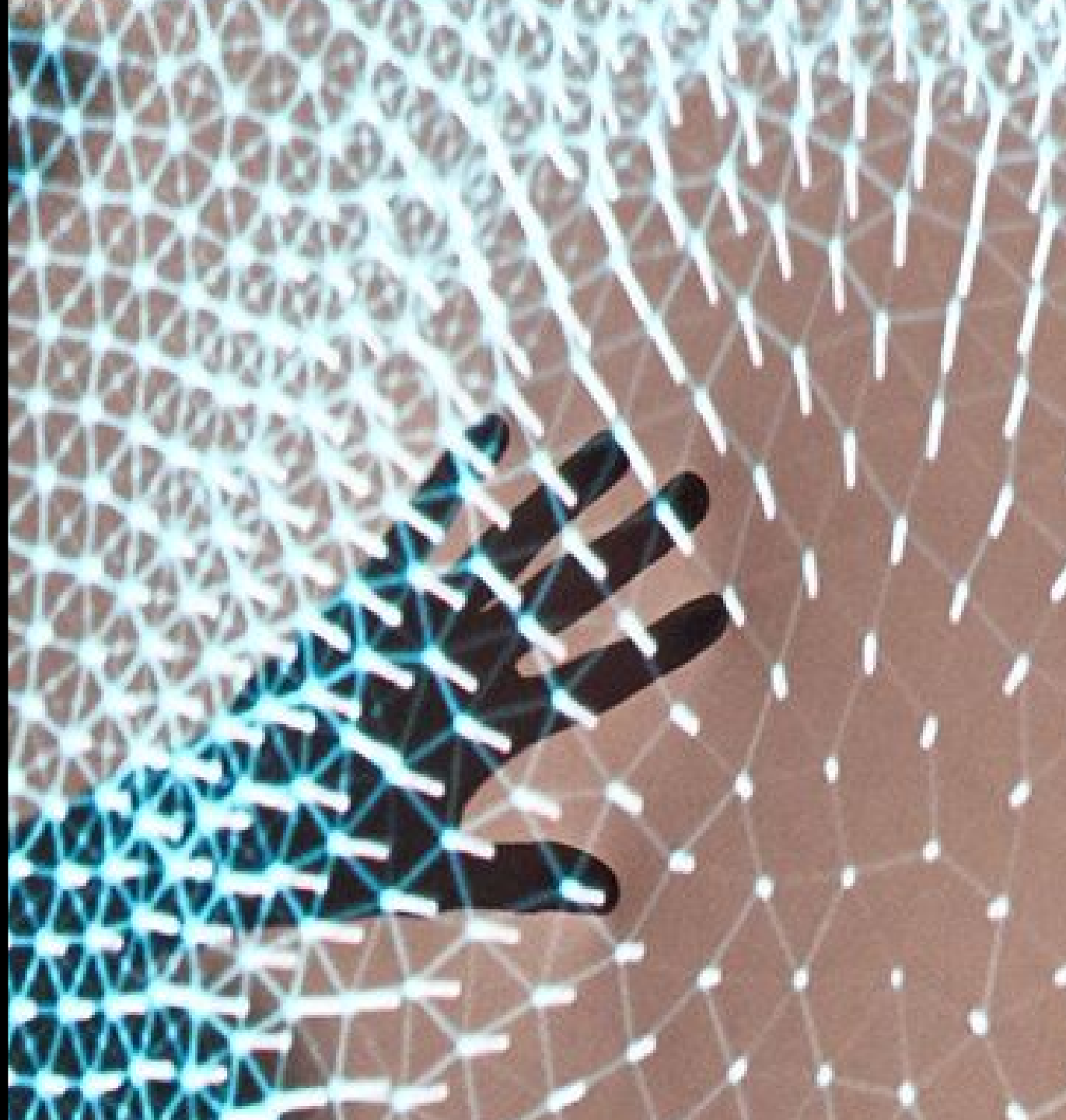


AAASeed

An introduction

Part 3: Baby steps

- Update AAASeed
- First steps
- Flatland
 - Flatland 101
- Multiscreen
- Multiscreen and Flatland
- APPlications



Update AAASeed

- Get AAASeed.7z

AAASeed.org

FILES section

- Replace existing AAASeed Folder

Reminder

you can rename AAASeed folders

current version (May 2025) needs 2 more dlls

libcurl.dll and cpr.dll

Available at AAASeed.org FILES section

Put it in AAASFoundation/AAADll

First steps

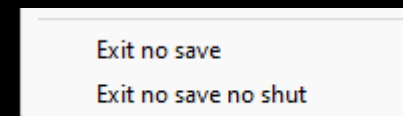
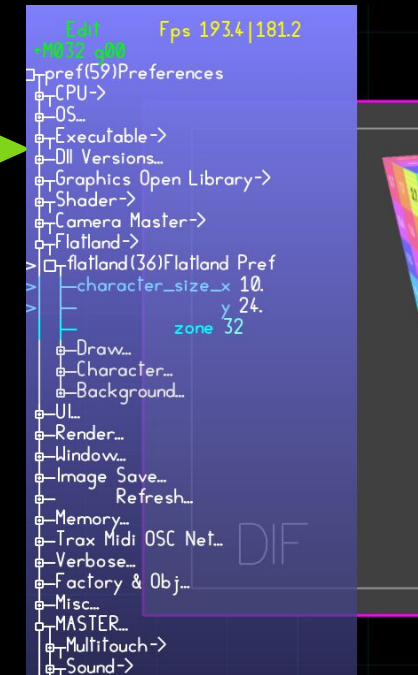
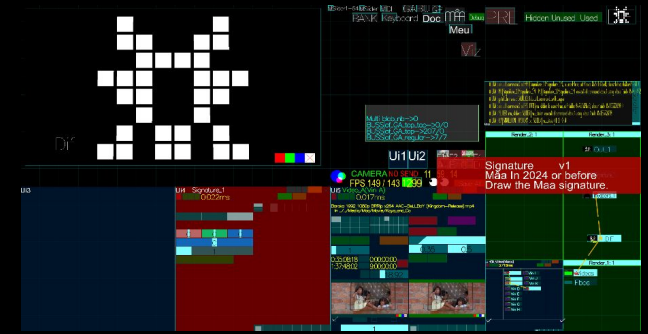
- keyboard first step

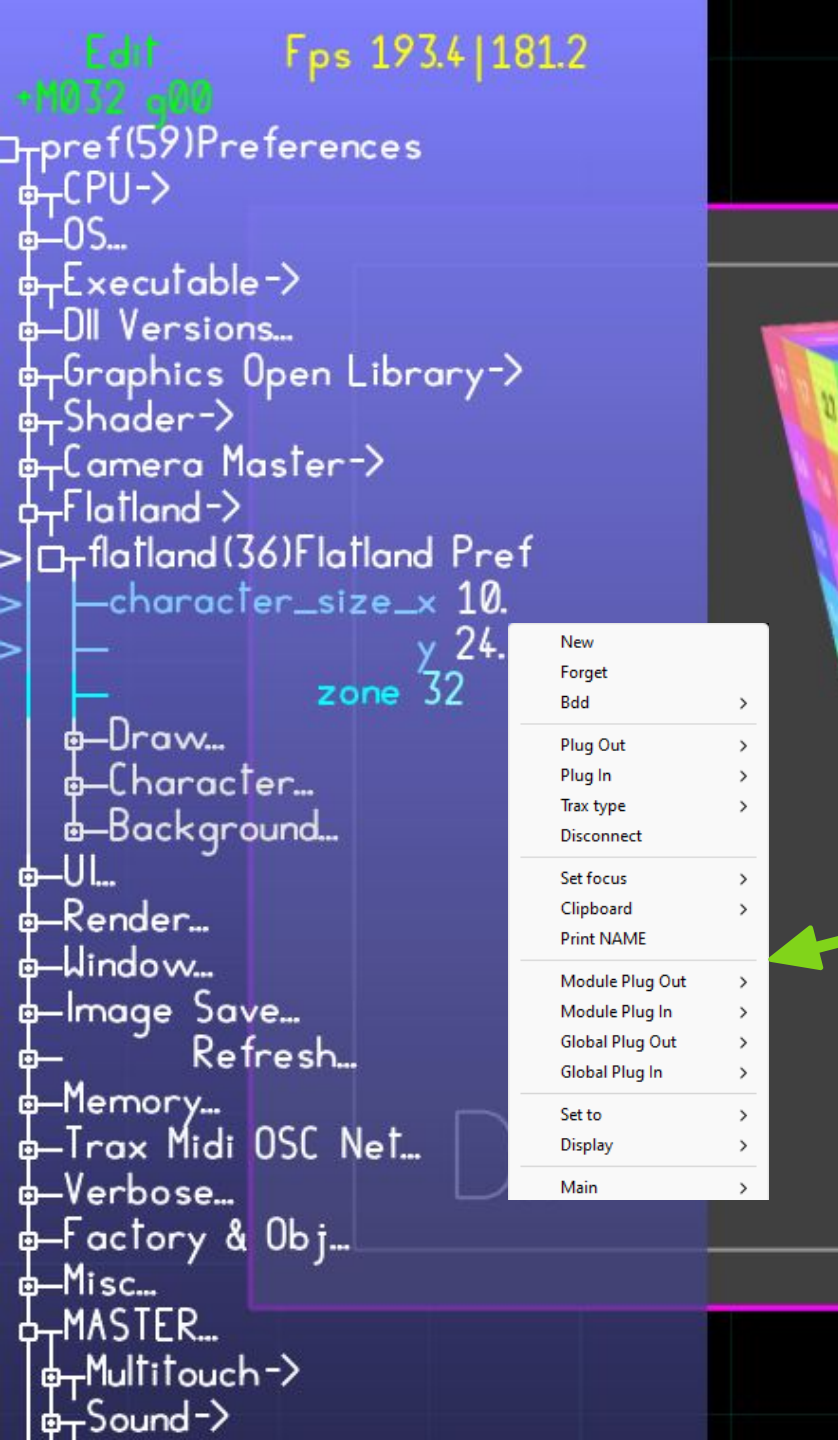
- w like (w)indow
switch between window and full screen Module
- Tab

switch Flatland On and Off
Ctrl e like (e)dit flip edit mode (more later on this)
see feedback at the top left of Flatland
Red LOCK **Green Edit**
leave it as **Edit**

- Quit, Exit ...

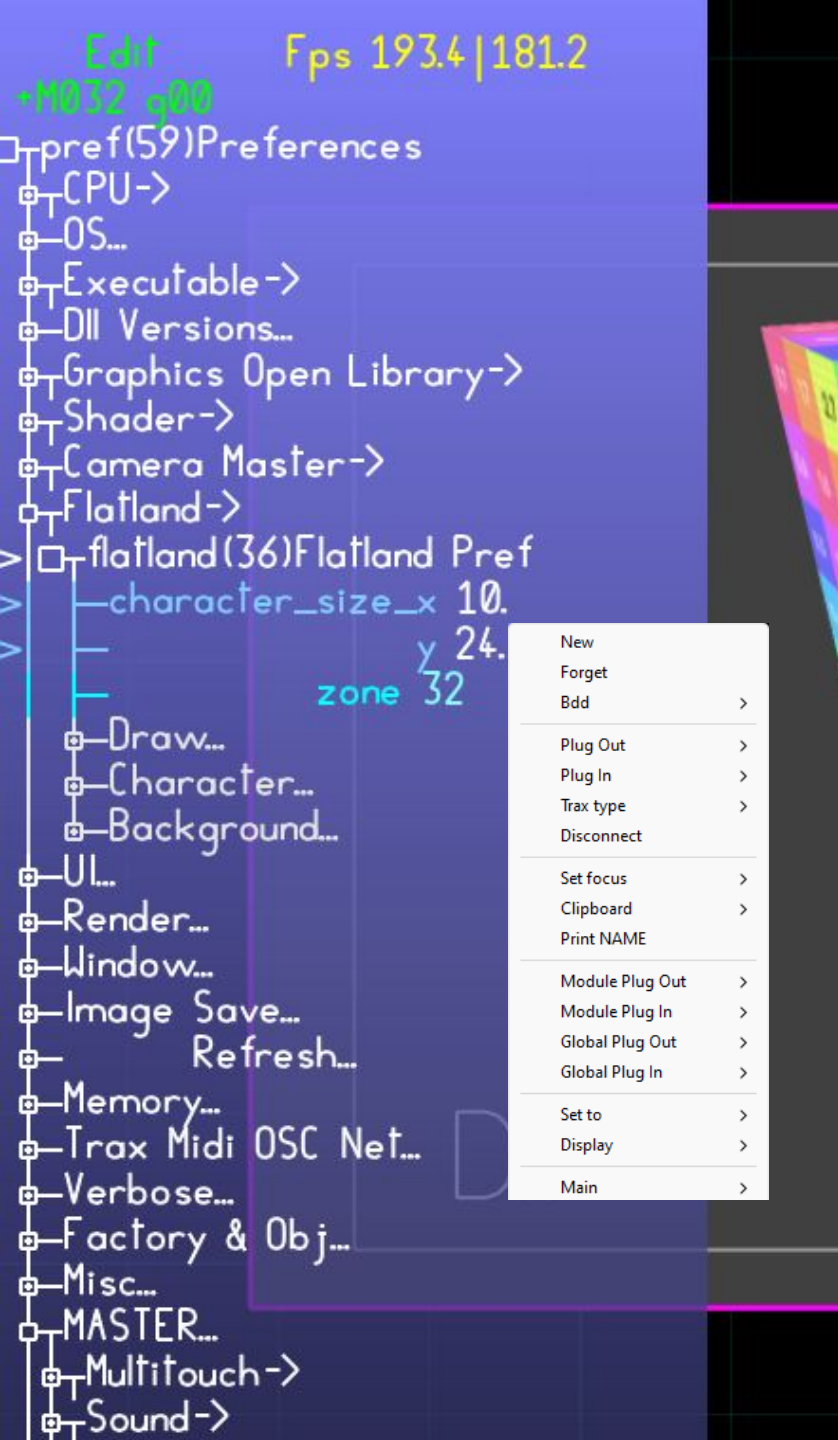
- Double Esc
Quit with saving global stuff
- Alt F4 or Mouse Right Button/Menu/Exit no save
Quit without saving global stuff
require a confirmation





Flatland

- Tab
- Original **AAASeed** interface from previous century where the **C++ can be seen and used** a whole world we will explore later made of **c_obj_ui** and **param**
 - **F10** → **Preferences**
example: change values in Flatland (next slide)
 - **Ctrl F10** → **Preferences at start**
- **Right Mouse Button** → **Menus**
 - in Flatland → **param** menu
 - out Flatland → **main** menu
- **GaBuZoMeu**
Start of Main Menu
- **Flatland have precedence for events and keyboard**
Needs to be off to use keys with GaBuZoMeu

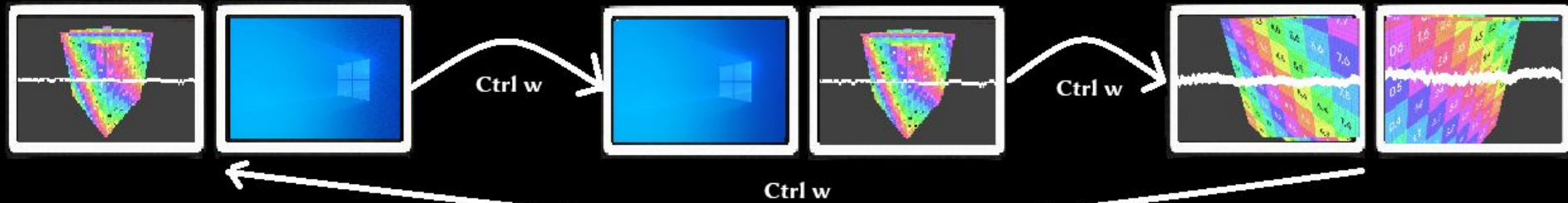


Flatland 101

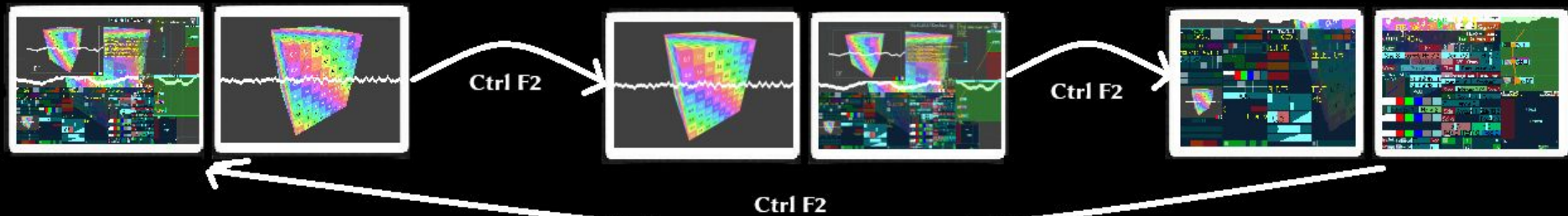
- Made of params (for parameters)
- Example: change values character_size_x/y
 - **F10** → Preferences
 - **Wheel** → Scroll
 - **Click (left Mouse Button)**
select / open
 - **Click and turn around starting Point**
change value
 - **Double Click**
edit dialog
 - **Keys + - * /**
change value
 - **Ctrl z**
undo (only last change)
- **Reminder**
Flatland have precedence for events and keyboard
Needs to be off to use keys with GaBuZoMeu
So leave it off for now → **Tab**

AAASeed and Multiscreen

- **w** like (w)indow
switch between **window** and **full screen** Mode
- **Ctrl w** circle through all the possible **full screen** configurations
Shift go the reverse way



- **Ctrl F2** change UI position on screens
Shift go the reverse way



- Same principles with more screens (up to 6)

Multiscreen and Flatland

- Flatland by default on left of AAASeed Window which can traverse several screens
- If it is a problem

switch screen position in desktop

See install 4/4 Multiscreen

or change Flatland position

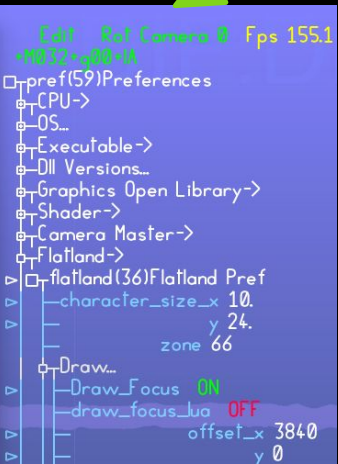
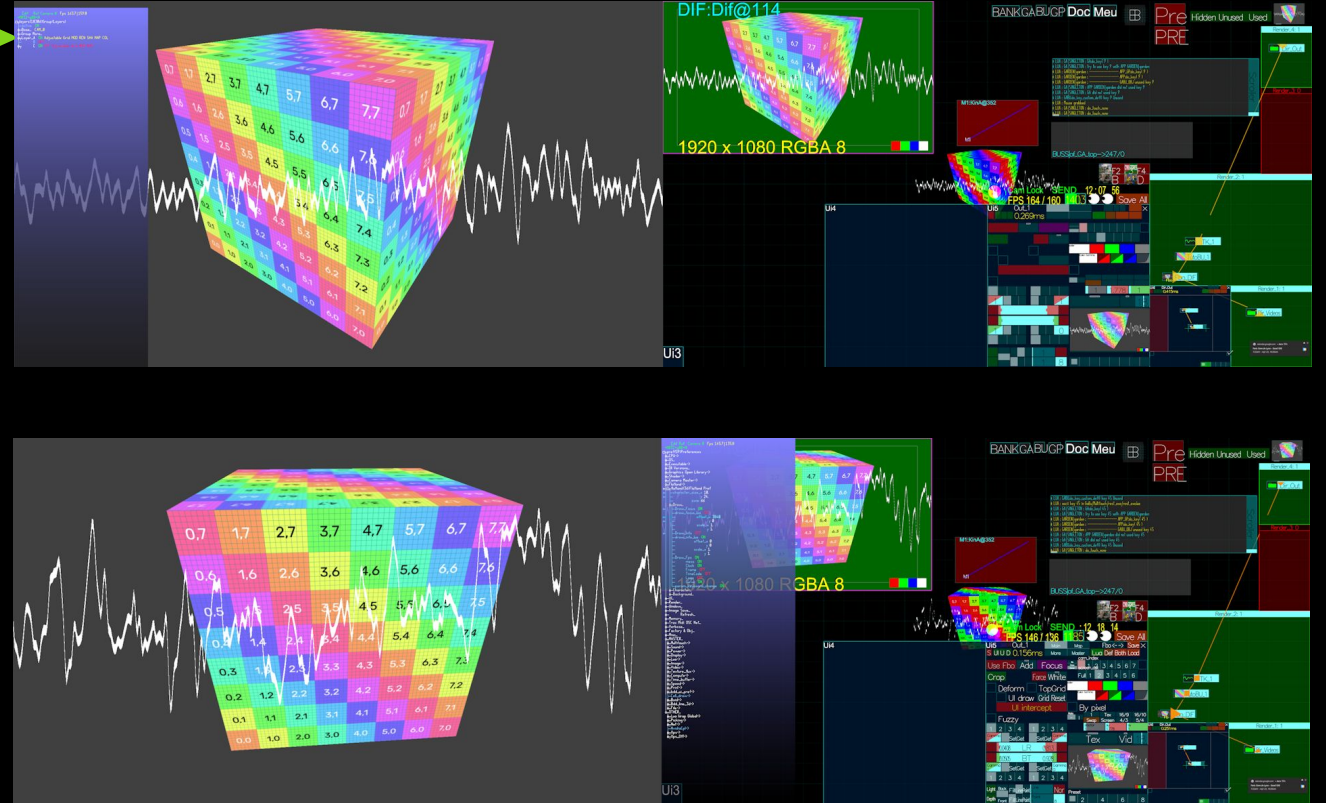
Flatland (Tab)

Preferences (F10)

Flatland/Draw

`draw_focus_offset_x/y`

Careful it can make Flatland invisible
(drawn outside)



APPlications

- Open APP/Application Garden_Base
 - Use Main Menu File/Open or Ctrl o

- **File Dialog**

- goto **Start** folder
 - then **AAAApps** folder
 - then **Tuto** folder
 - then **APP_garden_base**
 - **open default.layerss_param**

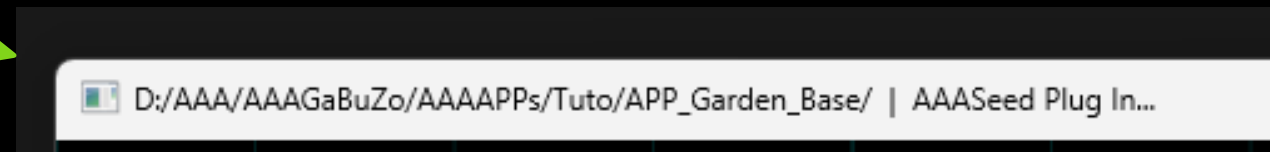
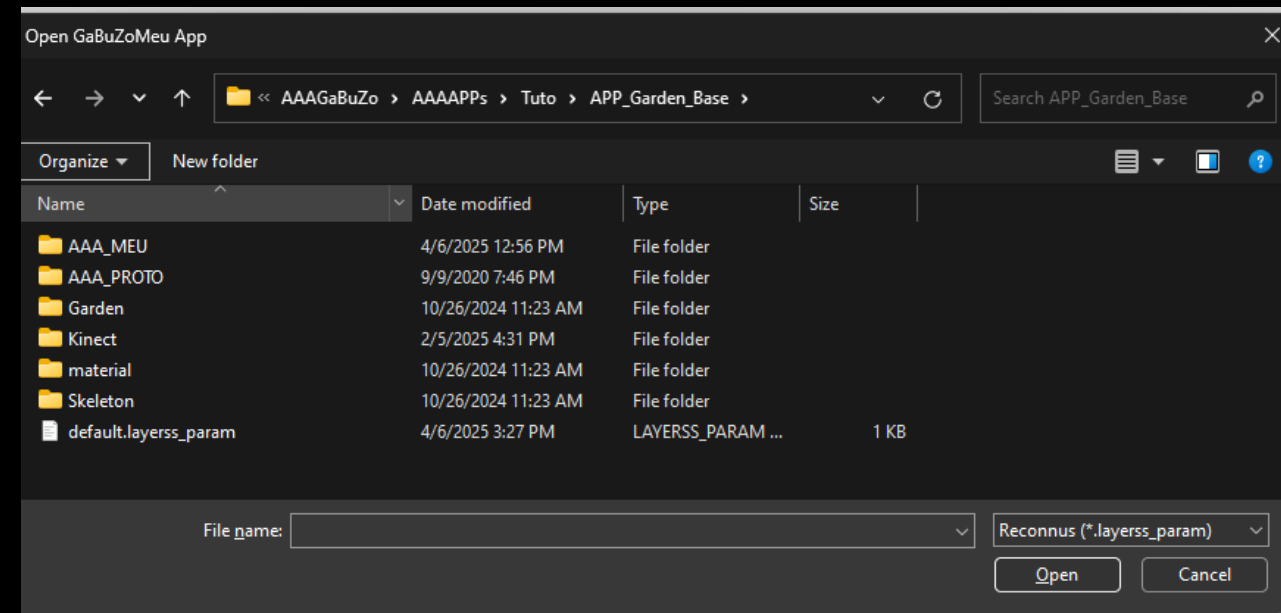
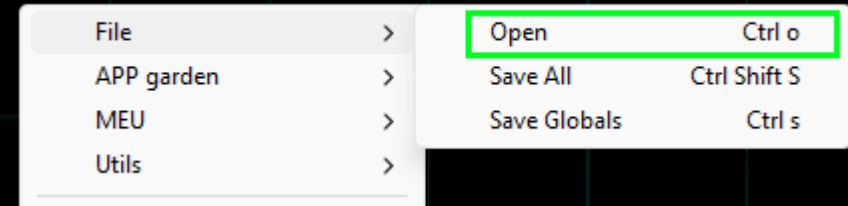
The APP is the folder

The folder is the APP

- Bug:

Sometimes you need to open it again

- **Name in the window bar**



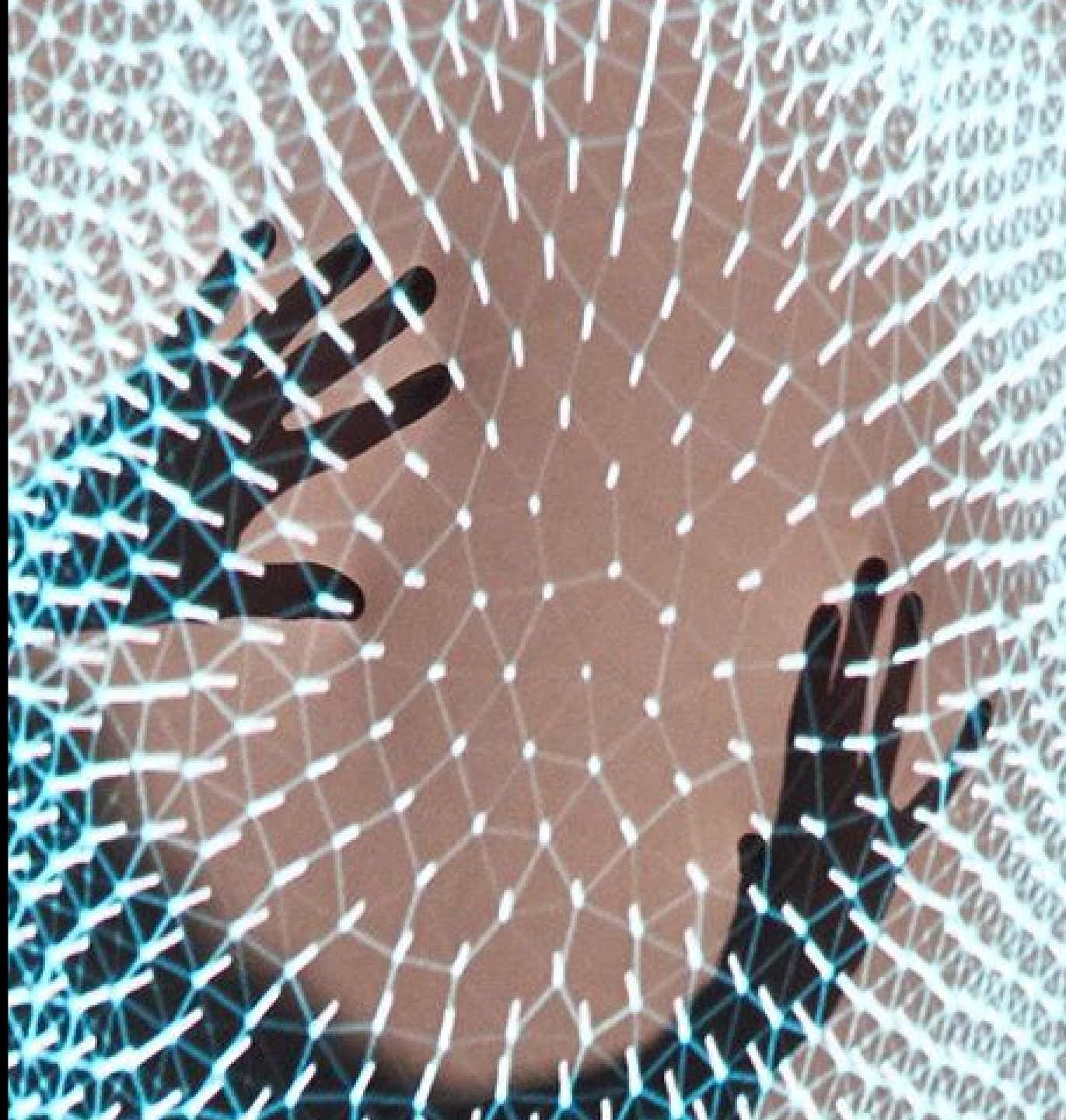
AAASeed

An introduction

Part 4:

BU first contact

- Basic UI
- BU Box User
- BU Resize Move
- StarMenu
- Dialog
- BU Current
- BU More on Resize



Basic UI

- **Don't be intimidated**

need to get used

UI is efficient.

- **Avoid Caps Lock**
it can cause confusion

- **F1 or Ctrl h like (h)elp**
Toggle **help** system

- **F2**
Toggle **GaBuZoMeu** UI

- **Ctrl F2**
Force **GaBuZoMeu** UI On and **move it between screens (see Part 3)**

- **F3**
Toggle **rendering process On/Off**
BU_Alive visualize its state
and is **Clickable**

Help the interface is still active except for the keys used by this help :

F1 or CTRL h : Toggle +|− | CTRL Mouse Wheel : Size

Arrows|Page up/Down|Home|End|Mouse Wheel : Navigate

AVOID AVOID AVOID Caps Lock : it will get you lost

Use a Mouse or TouchScreen

GaBuZoMeu

GA

Global Action

BU

Box User : the interface elements you can interact with
unused for now (don't worry we working very very hard on it)

ZO

Module Editable Unit : an encapsulated functional Block

MEU

Module Unit : a compact MEU view used to control the execution order

MU

MOUSE

Left Button

Action

Wheel Button

Scroll

Right Button

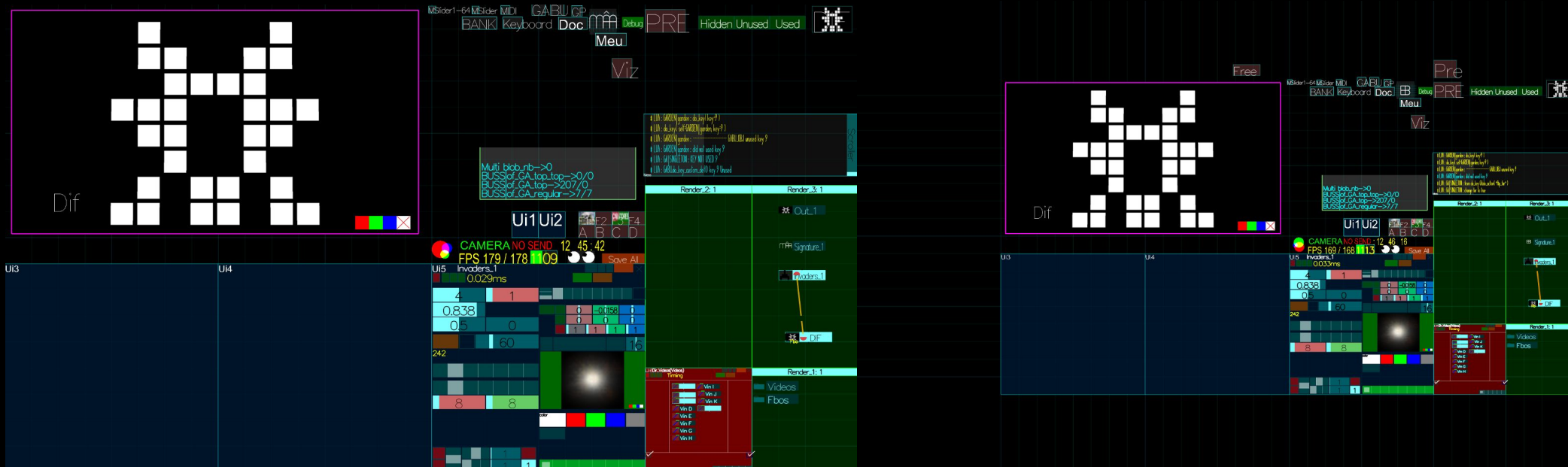
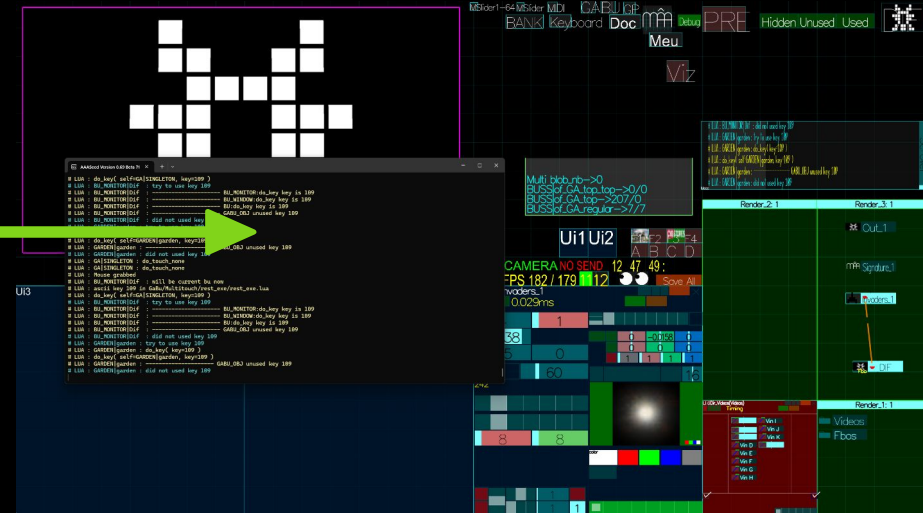
Menu



Basic UI more

- m like (m)essage
pop the terminal window

- Ctrl Tab
Toggle between two UI Scales



BU = Box User

- The **atomic UI element** in AAASeed.

Hierarchical:

BUs contain BUS

BUS contain BUs

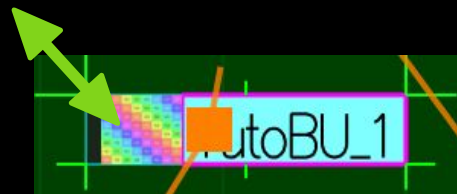
BU / BUS / BU / BUS ...

Interactive:

Click, resize, move, or nest them to build UIs.

- To see this

Click on the icon of TutoBU_1



- Click**

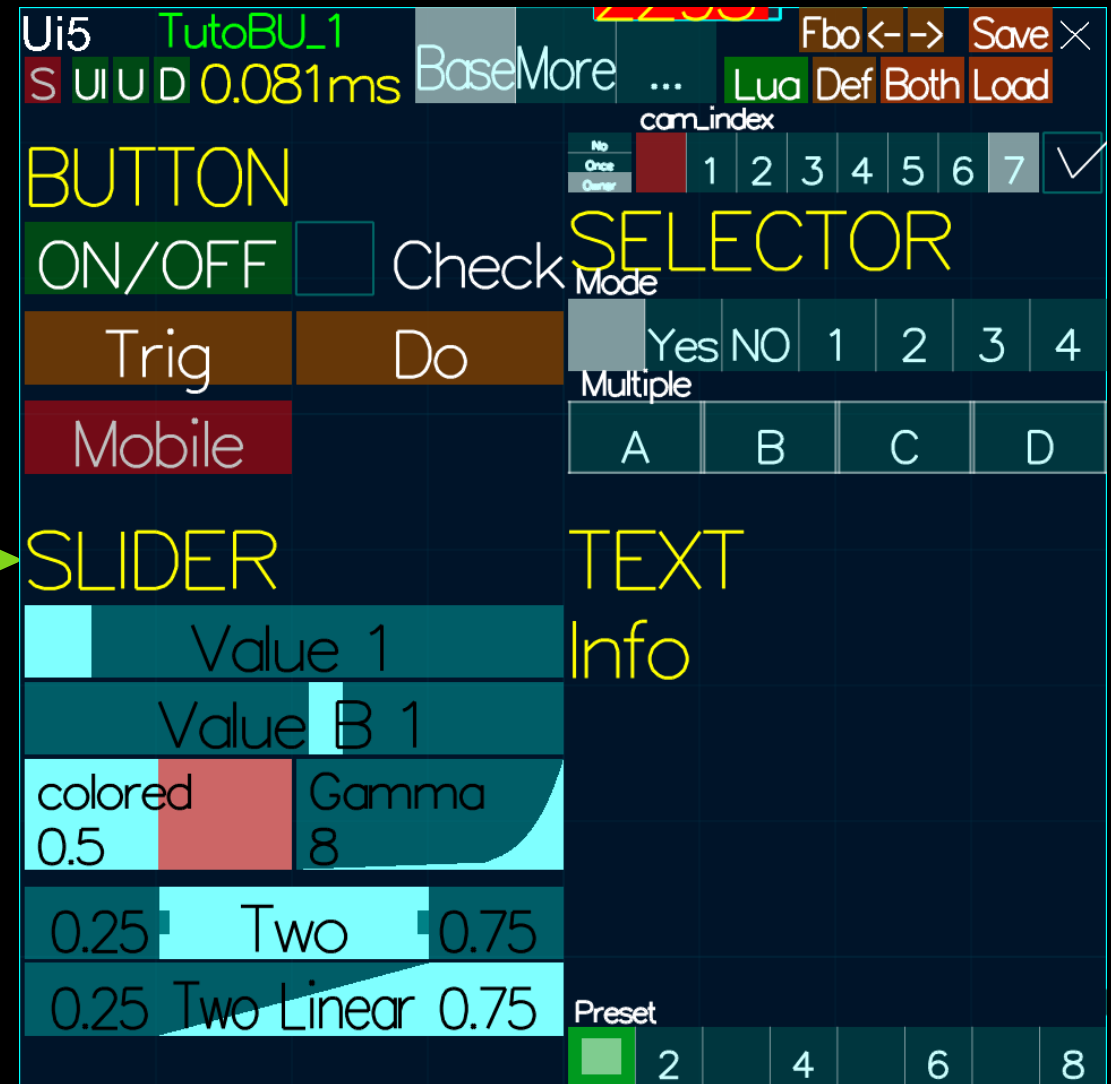
- Done with **left button**
- **4 types**

Simple

Double

Triple

Long (stay fix with button pressed)



BU Resize Move

- Hold Alt

Transparent

You can see under
Blue Flashing Frame

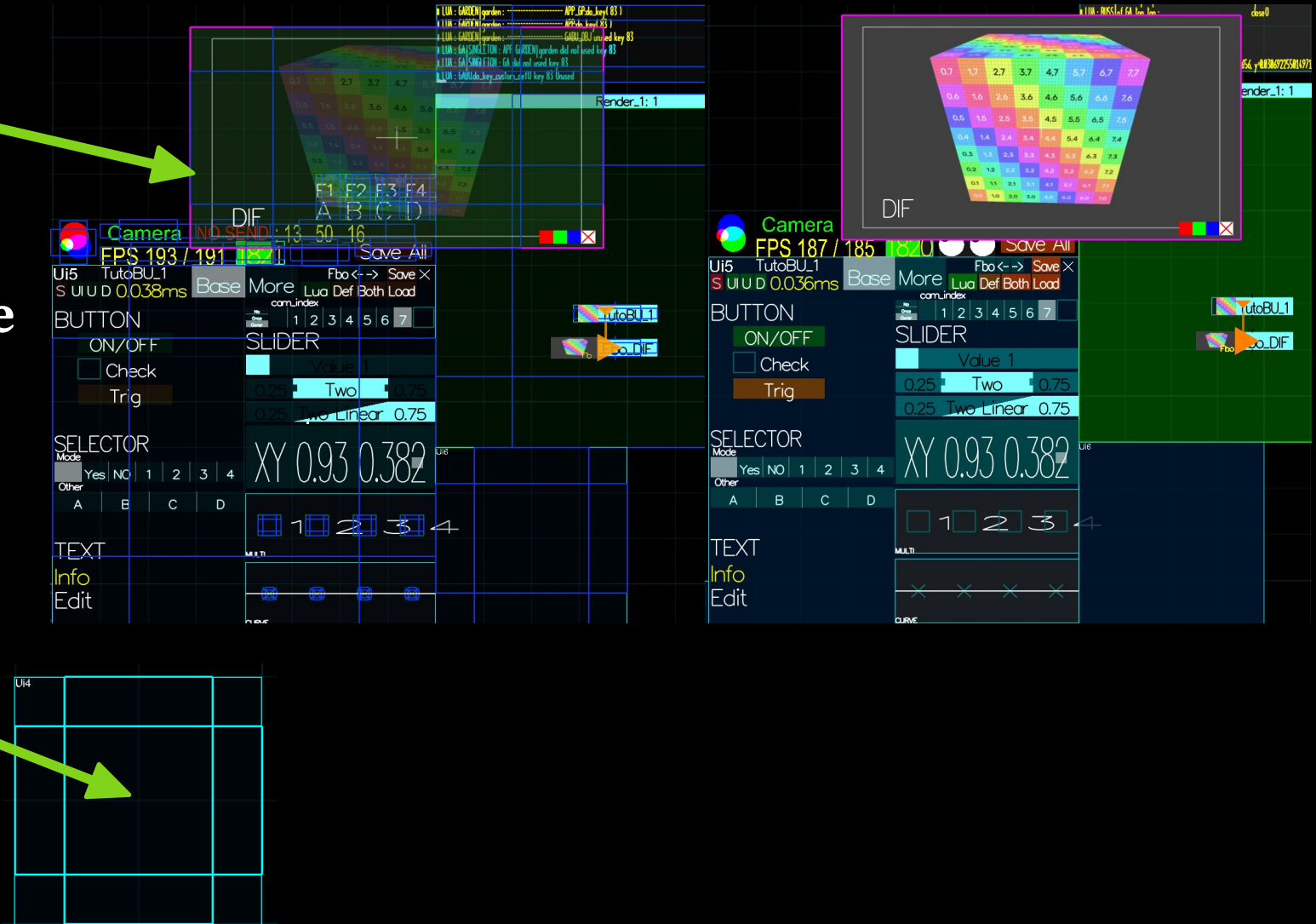
- Click with Alt

- Move

Center zone

- Resize

8 edge zones



BU StarMenu, Dialog

- Click on TutoBU_1 slider



- StarMenu**

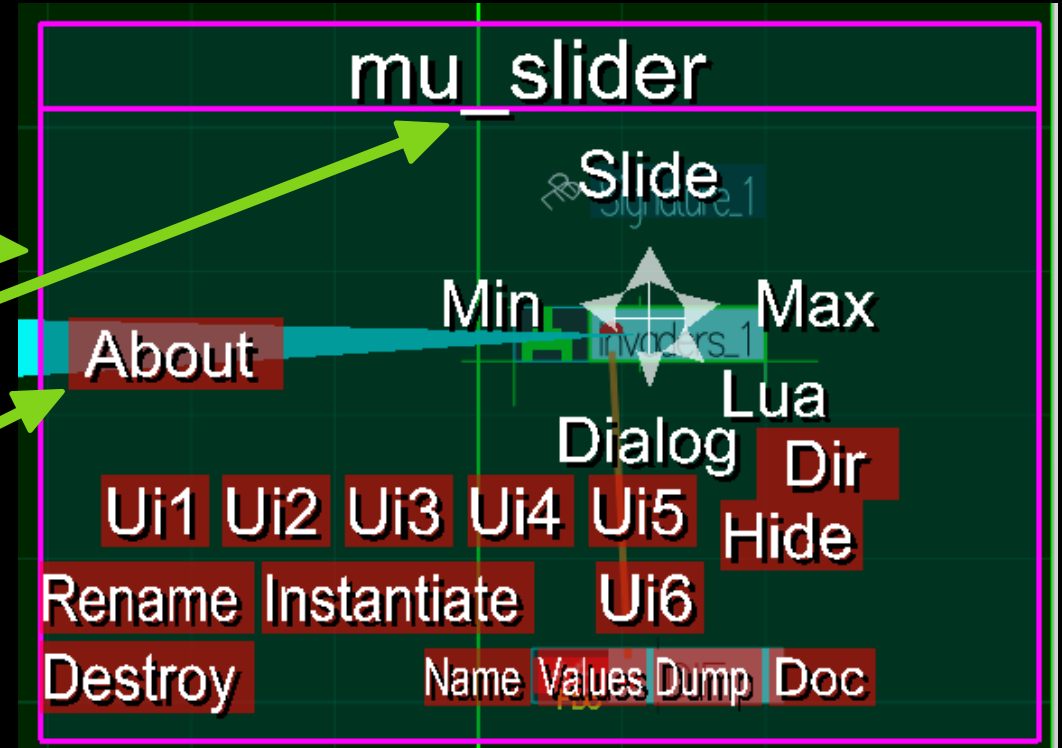
Also named **UIF** for **UI Fast**

Context Menu: AAASeed UI by proximity

Context Menu with

- Zones
- Button
- Name of BU at the top

- Example: use **About** button

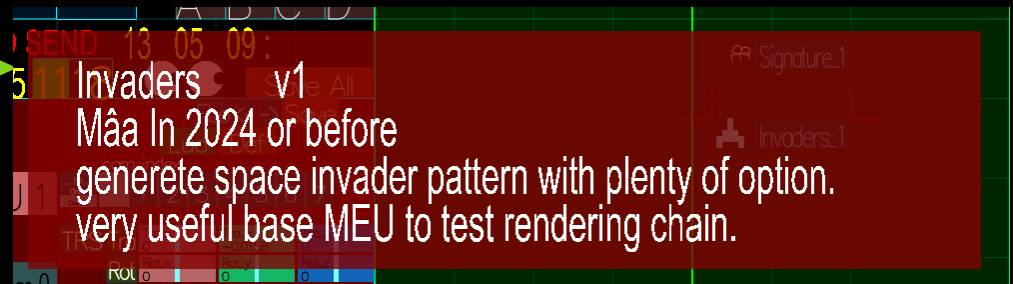


- Dialog**

Flashing Red for attention

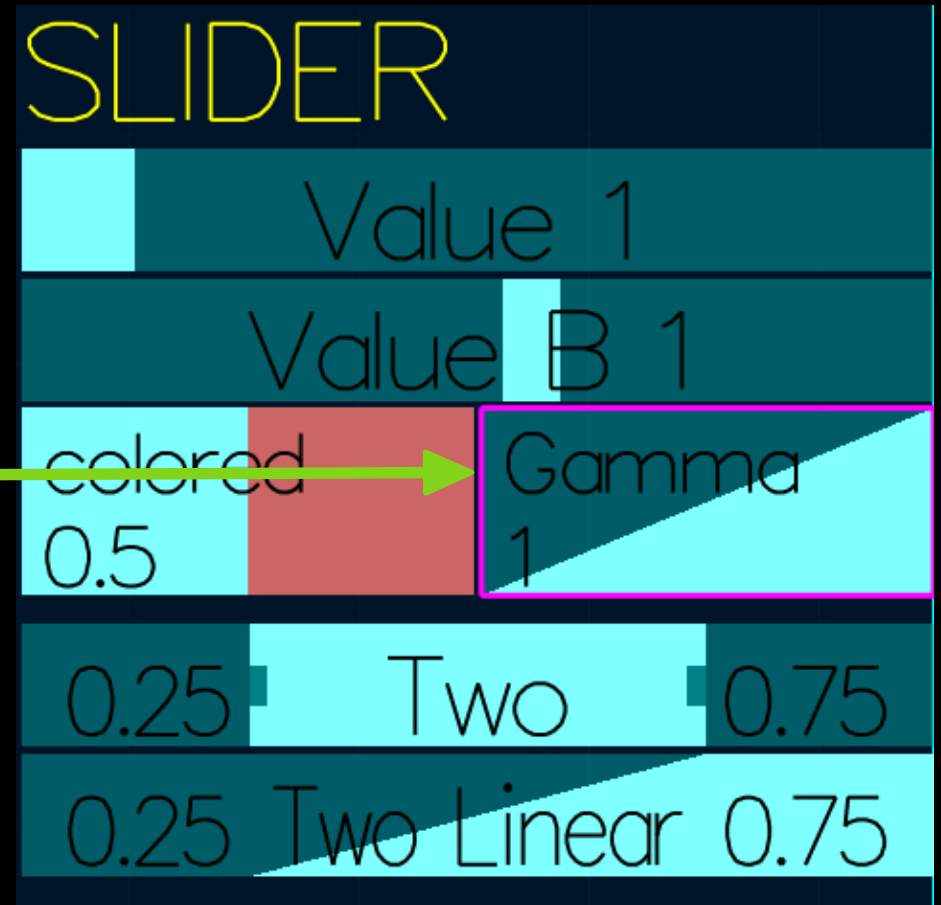
Move / Resize using Alt as Always

Click to dismiss



BU Current

- Clicked BU
becomes **current**
Violet frame ←
Receives keyboard input
- Arrows key to navigate
need to be refined
in some cases (2025 June)



BU Resize more

- Alt click move resize

Alt Arrows **Move**
Alt + - * / **Size**

- 3 states:

Normal / Full / Mini

- Shortcuts

Double-click

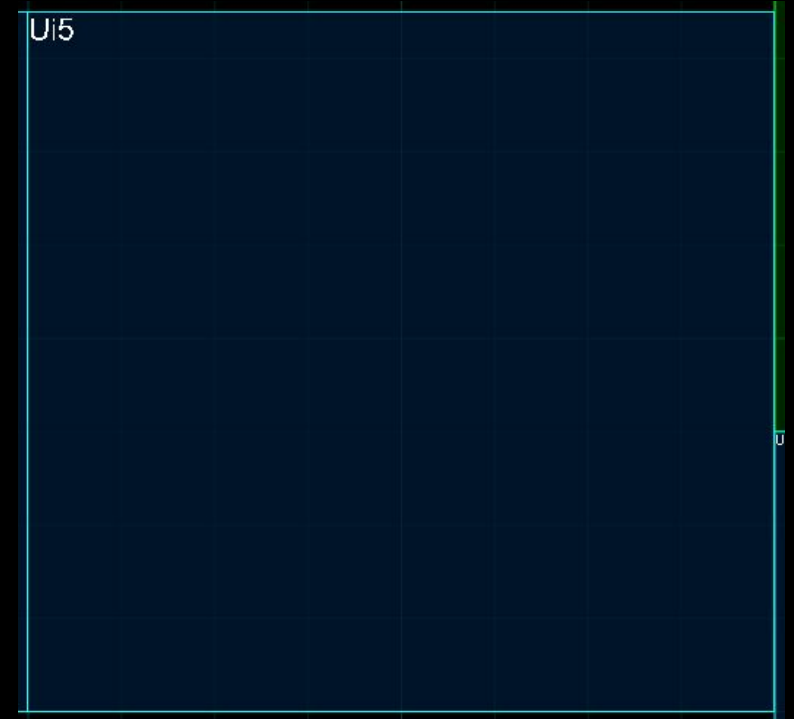
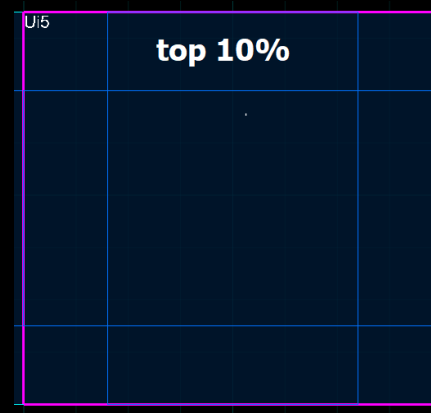
Space

Toggle Normal ↔ Full

Double-click top 10% → Mini

Ctrl Space

Toggle Normal ↔ Mini



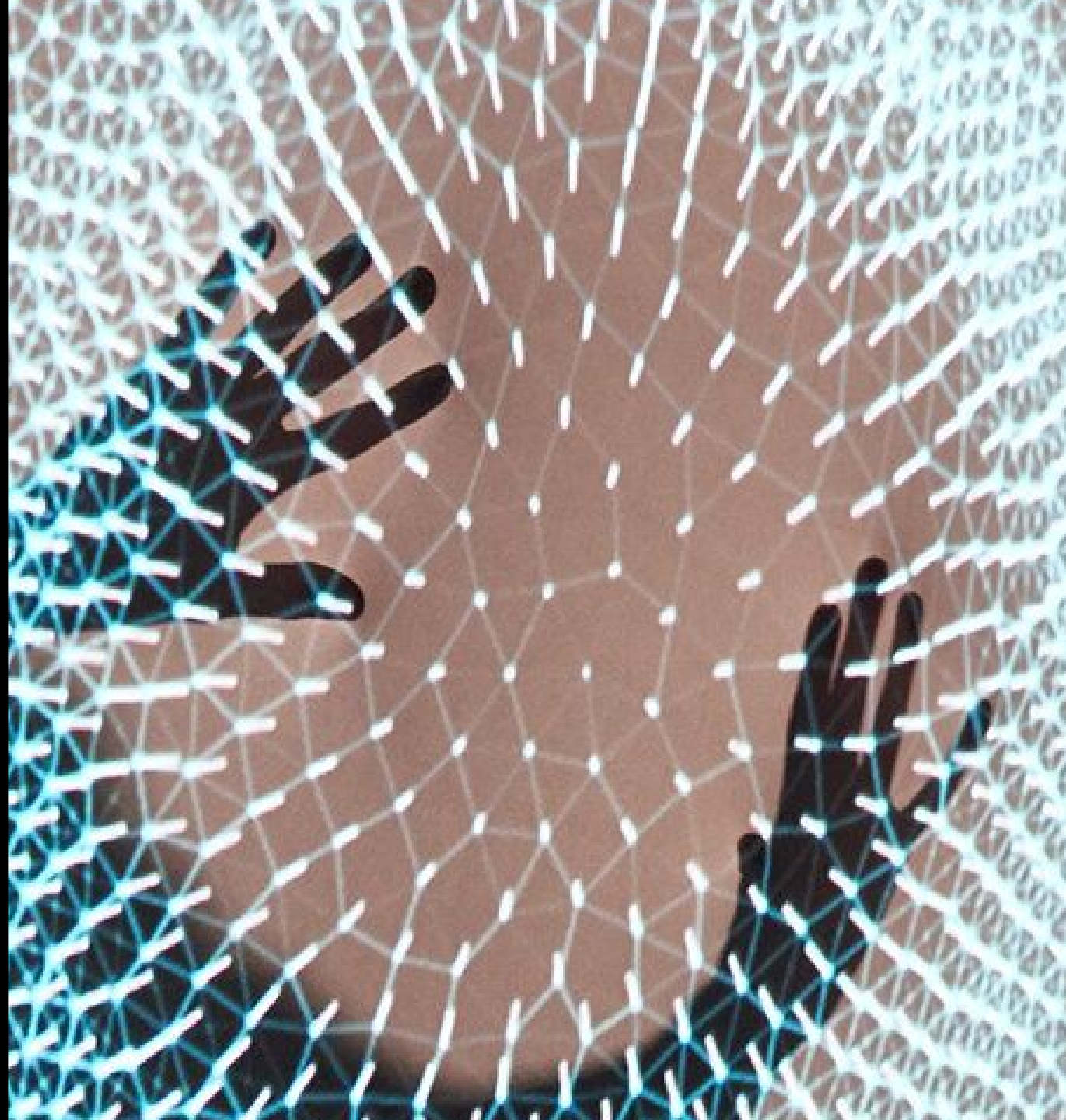
AAASeed

An introduction

Part 5:

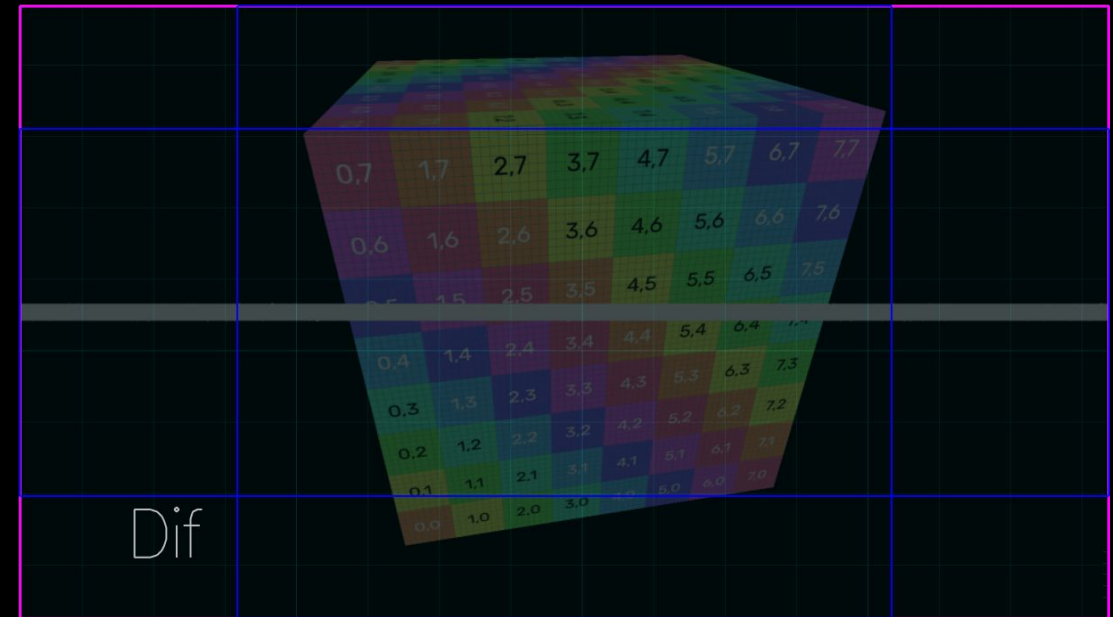
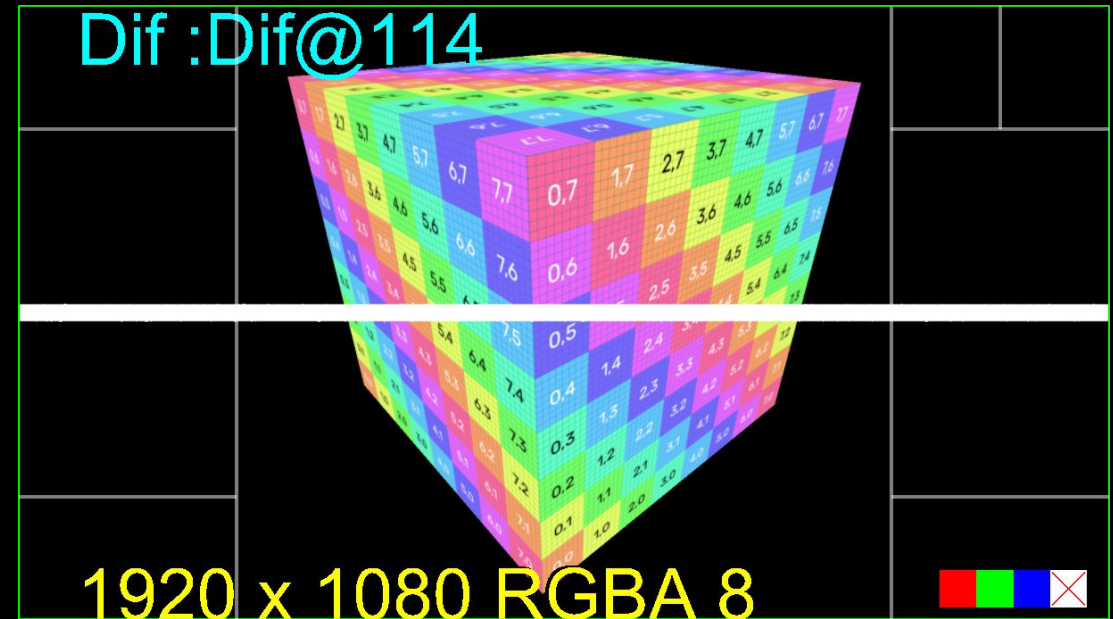
BU_MONITOR

- Channels
- Alpha
- Click Zones
- StarMenu



BU_MONITOR

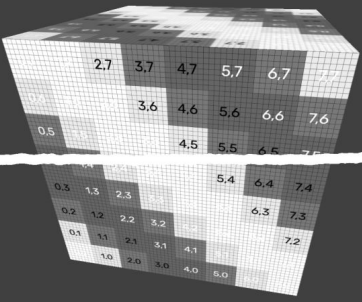
- Display Image
- when clicked
Display information
Click zones
- Move/Resize as usual
Alt...



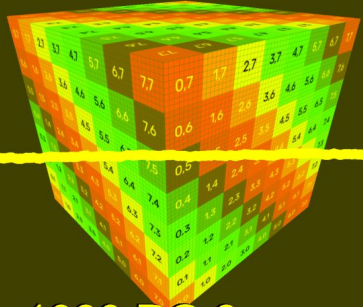
BU_MONITOR Channels

- In fact BU_MONITOR shows textures
- Textures have a number of channels
 - 1 or R for Red
showed as greyscale
 - 2 or RG for Red + Green
 - showed as yellow
no Blue
 - 3 or RGB for Red + Green + Blue
full color
 - 4 or RGBA for RGB + Alpha
like RGB but with transparency/Opacity
0 mean transparent, 1 Opaque
different method to display Alpha
Regular / Inverse / No
See next slide

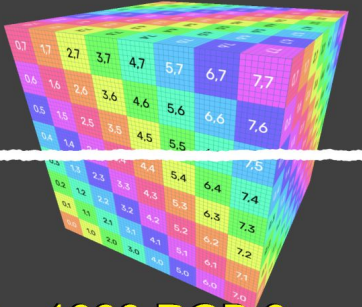
1920 x 1080 Red 8



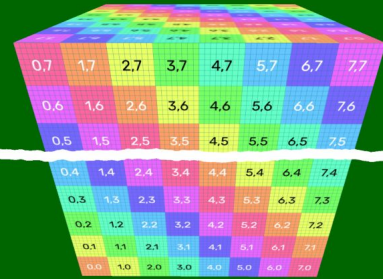
1920 x 1080 RG 8



1920 x 1080 RGB 8

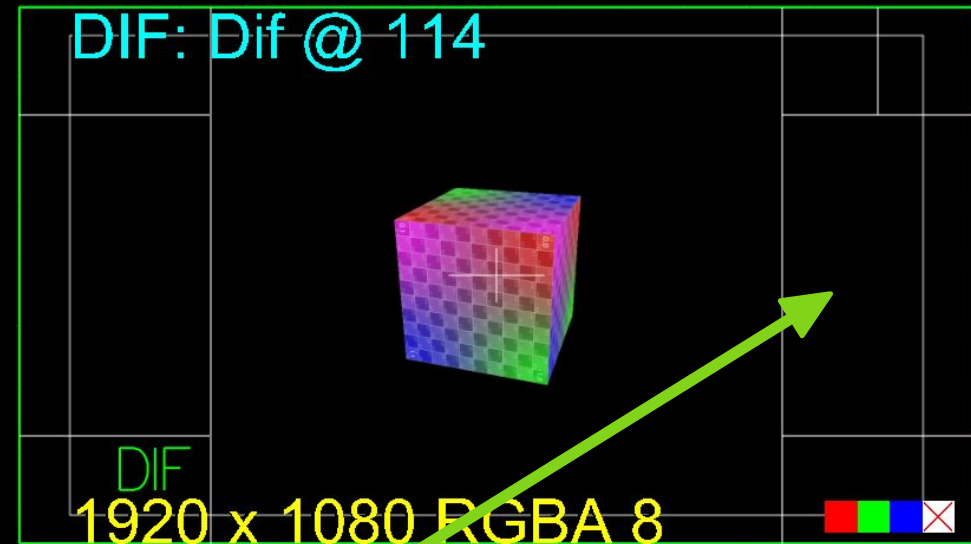
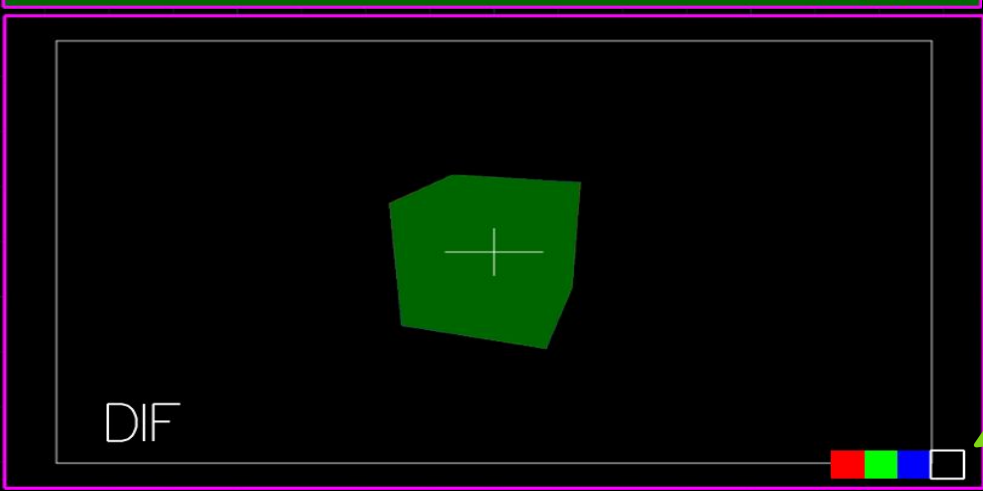
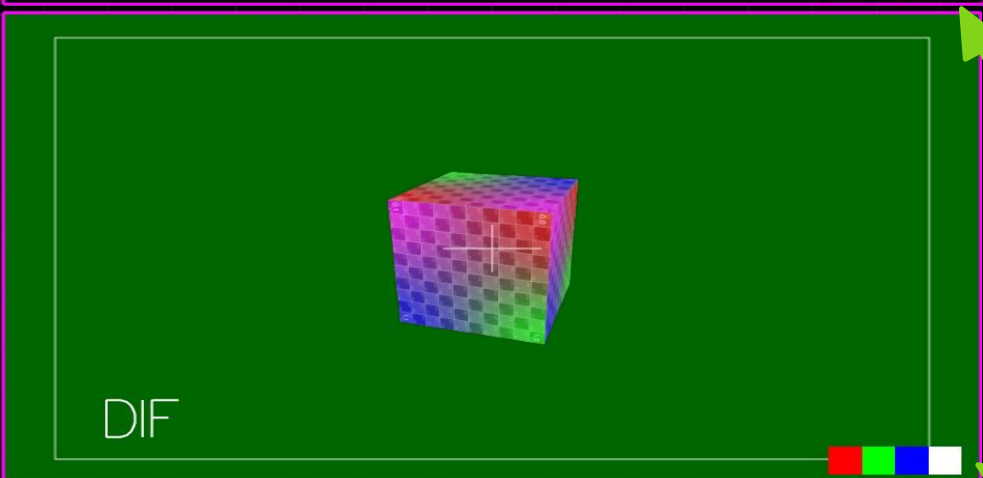
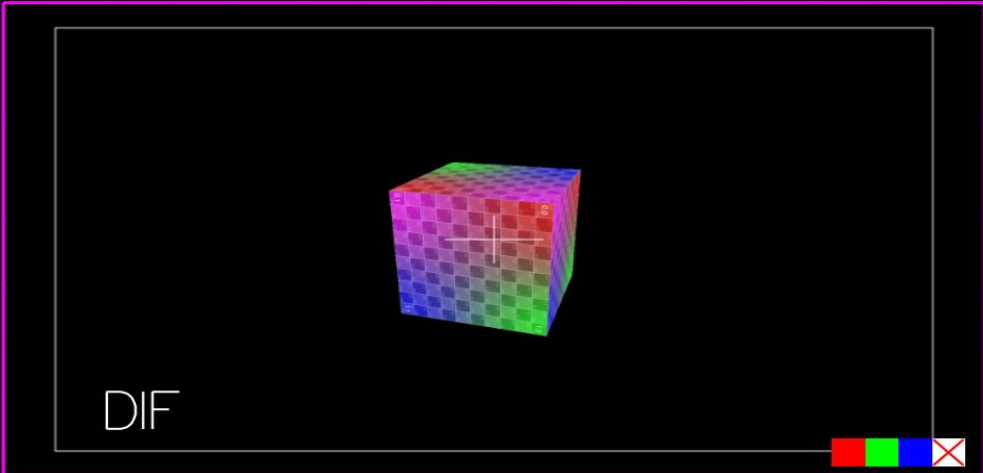


DIF
1920 x 1080 RGBA 8



BU_MONITOR Alpha

- Click zones



- Click in Right Middle

change how

alpha is displayed (only RGBA)

same as **Key + / -**

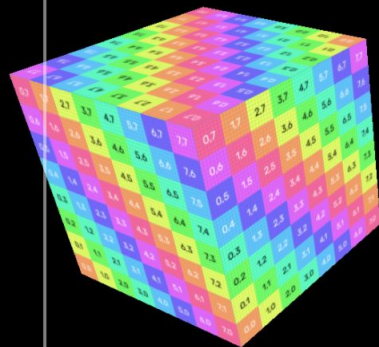
BU_MONITOR Click Zones

Flip
Bank/Bind
information

DIF:Dif@114

Flip
both
information

Flip
Texture
information:
resolution and format

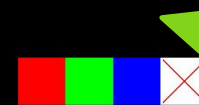


DIF
1920 x 1080 RGBA 8

Flip
Window
More

Flip
Window
Draw Top

Flip
Alpha Mode
or Key + -



Flip
channel
display

BU_MONITOR StarMenu

- **Click and drag out quickly (Quick drag-out)**
like any BU where it doesn't appear directly

- **Open**

Load an image via a file dialog
at the current bind
later on this
can choose several files
loaded in successive binds

- **Save**

Save the Image
to Media/AAASnapshots
How it is saved
in Flatland/Prefs/Image Save

- **Save As**

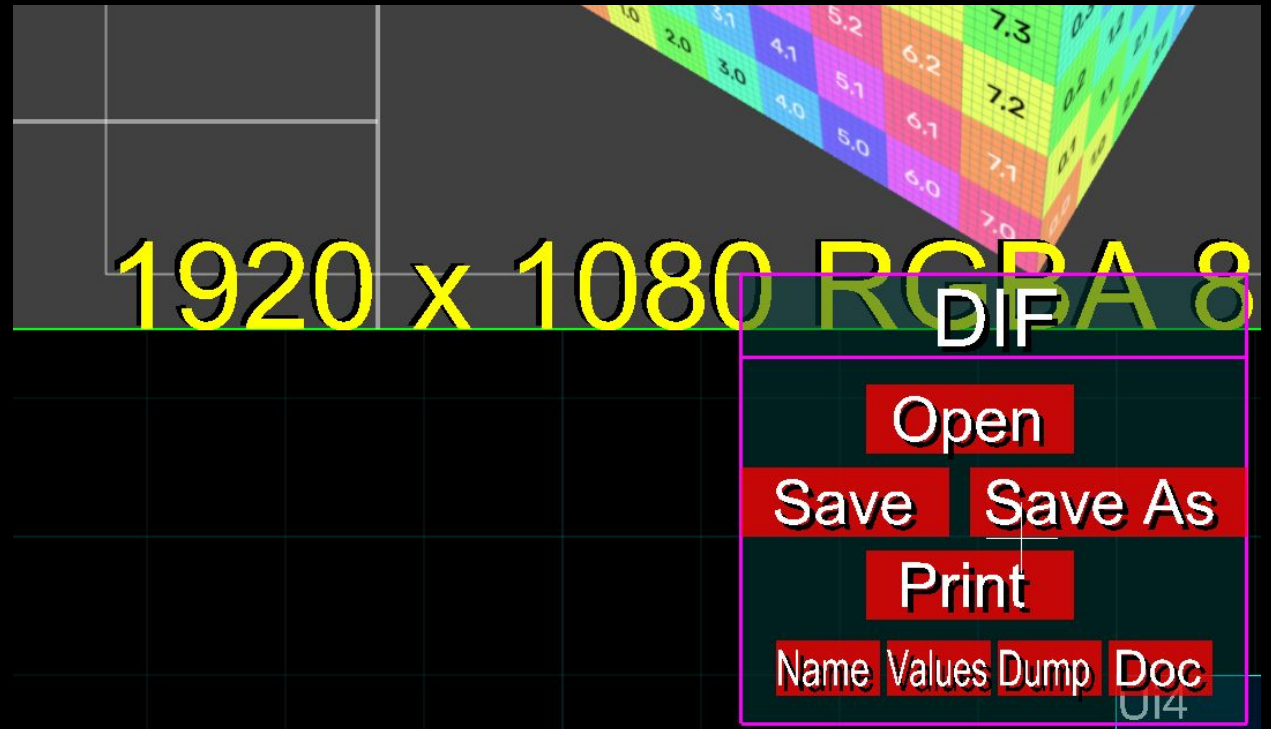
idem but via a file dialog

- **Print**

Print

How it is printed

in Flatland/Prefs/MASTER/Print



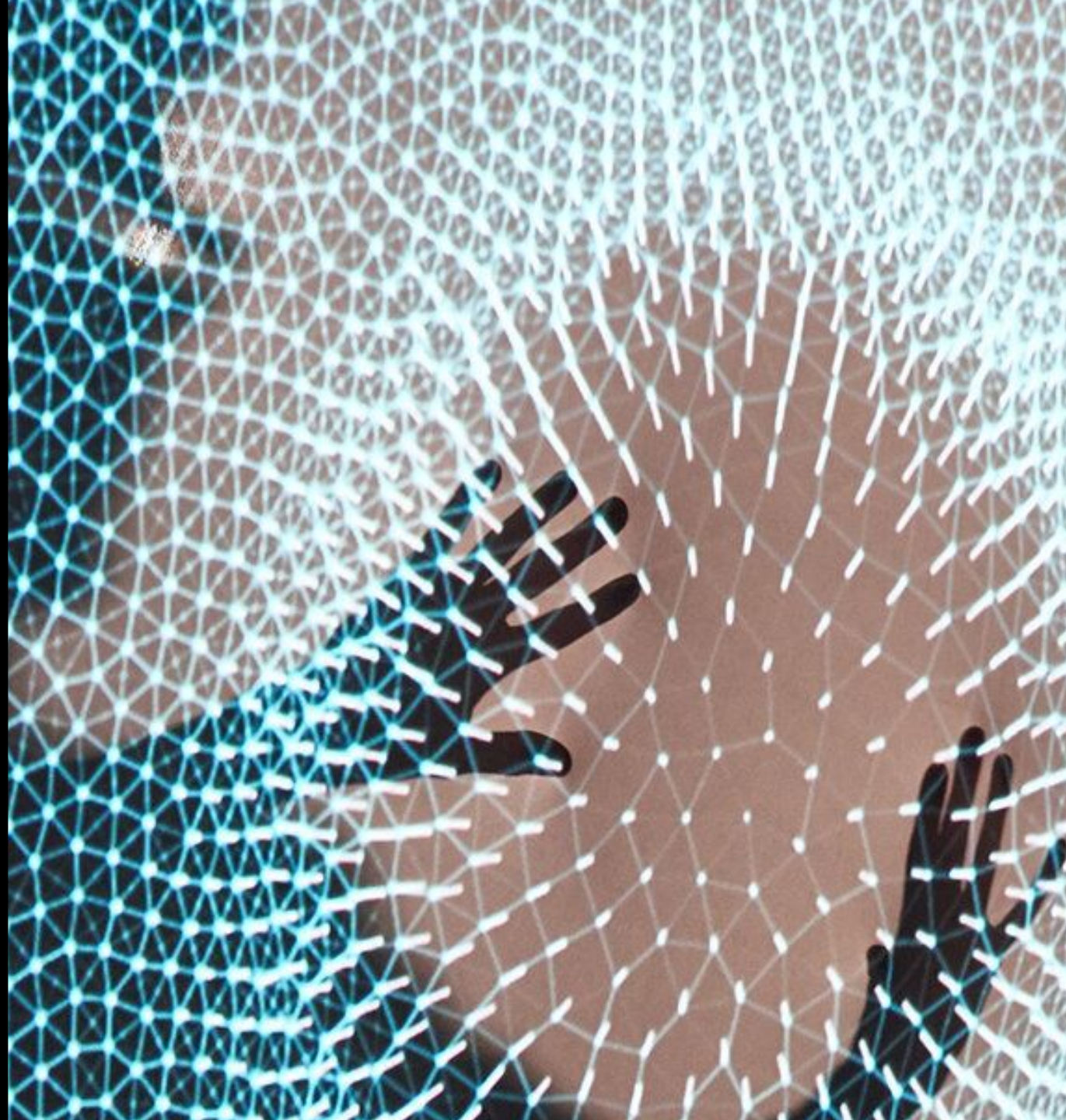
AAASeed

An introduction

Part 6:

BU is all you need

- BUTTON
- SLIDER
- SLIDER_TWO
- SELECTOR
- BU_TEXT

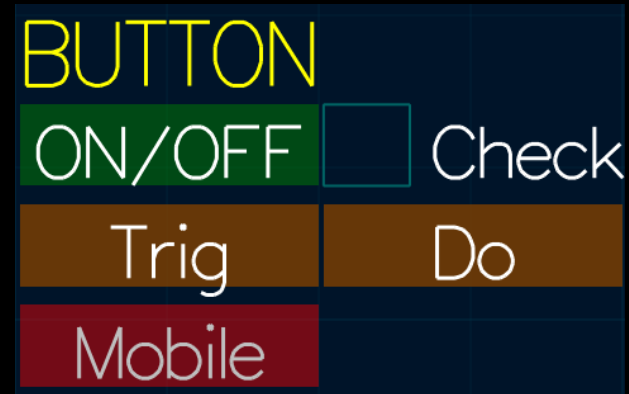


Basic BUs

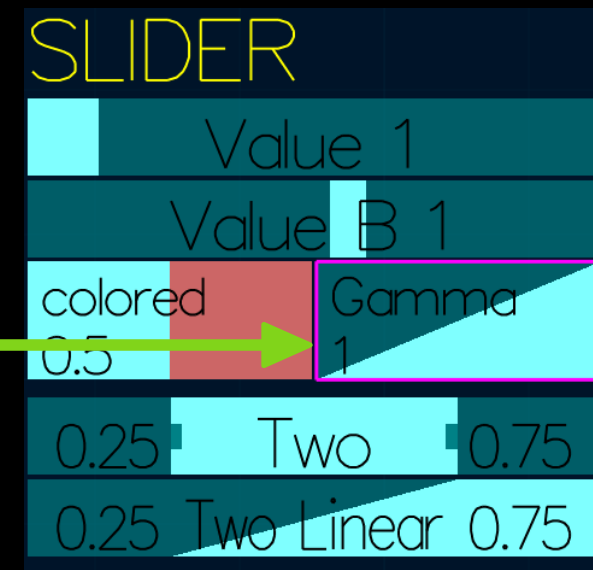
- Click on Train_BU icon



BUTTON
SLIDER
SELECTOR
BU_TEXT



- current **BU** (reminder)
See previous slide
receives keyboard
violet rectangle
navigate with arrows keys

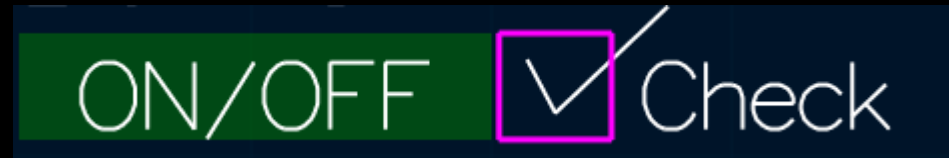


BUTTON

On/Off

2 versions

green / Red
checkbox



Developer note: boolean or integer

Trigger

Launch an Action

Usually Orangish

with eventually confirmation



Could be **movable** too (Alt)

StarMenu Access

– Quick drag-out



SLIDER

- StarMenu
- Slide



Go up in Slide direction

Go to external circle

External circle → change

Internal circle → no change

Intermediate circle → interpolate

Angle change value

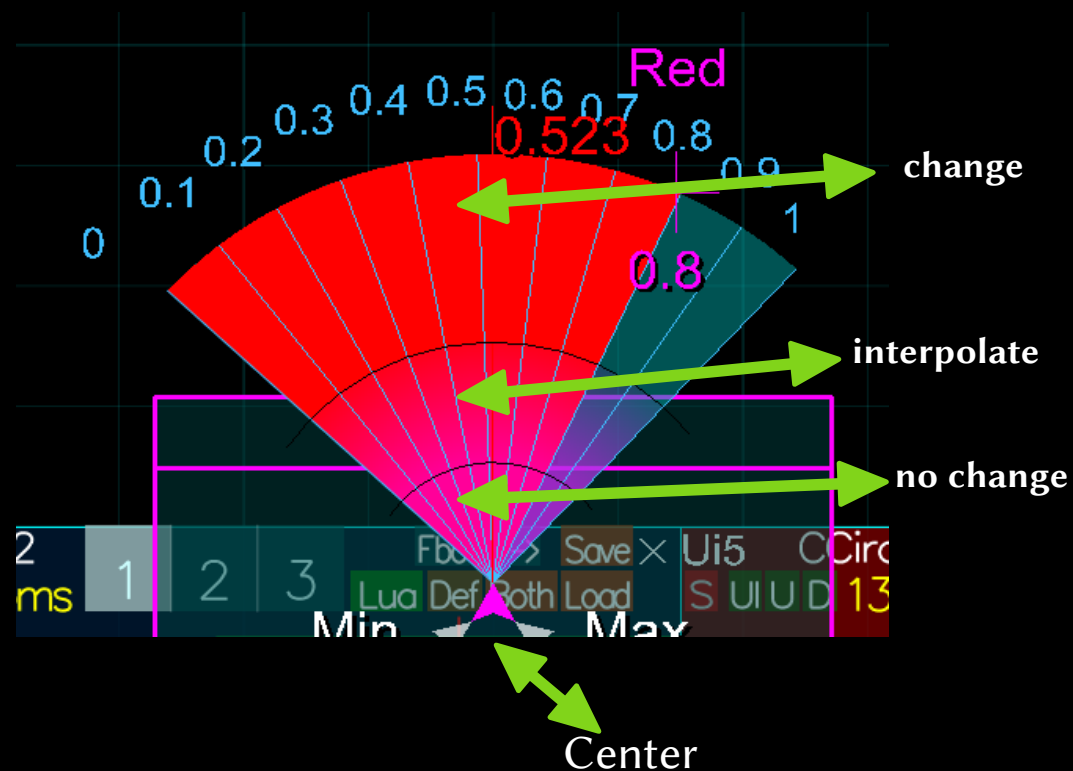
the more away from center the more precise

Go back to internal circle to cancel

Shift → lock on closest default value

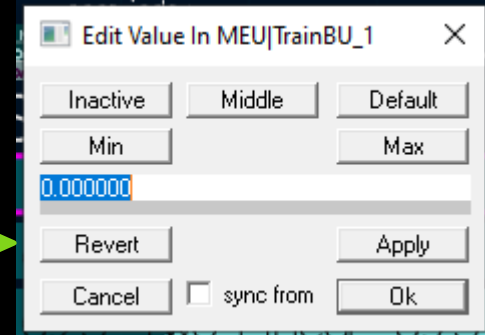
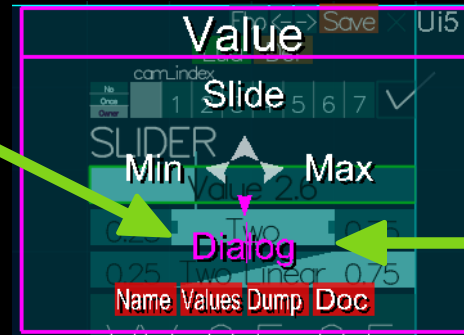
Ctrl → smaller change from start value

Ctrl Alt → even smaller change



SLIDER

- **Min / Max**
defined for each slider
- **Dialog edit**
Double Click or Dialog zone
- **Keys**
current BU and no Flatland
 - + - * / → change
 - Enter → inverse
 - . → floor integer
 - Home → Default
 - End → Inactive
 - PageUp → Maximum
 - PageDown → Minimum
- Can be **Floating point or integer**
- Can be Constrained by Min/Max bounds



SLIDER_TWO

- Same but **2 values**
- Range / Linear
- Value change depends **where you click**

Closest is selected for interaction

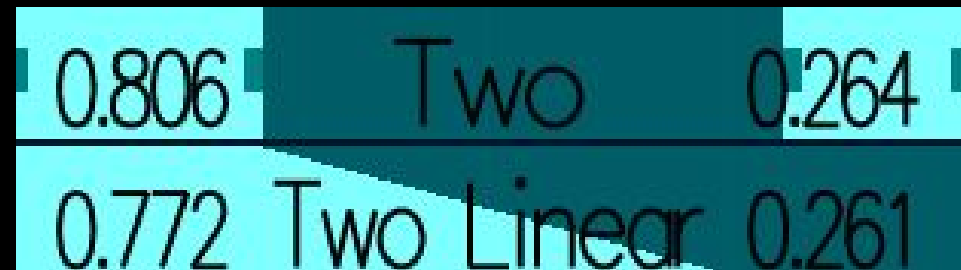
Last interacted value receive keyboard input



- Can be **Flipped**

Left value bigger than right

Can be seen



SELECTOR

- Click
- Keep mouse down

Change with position



- Access to StarMenu
like **BUTTON**: Quick drag-out

- Use **keyboard** as for a **SLIDER**
+ and - mainly
- **Multiple selection** an option
display frame around each item



SELECTOR (Continued)

- Slide functions for selector too

Go up

then angle

Shift

lock on values

Ctrl or Ctrl Alt

sensibility

- Keys as usual

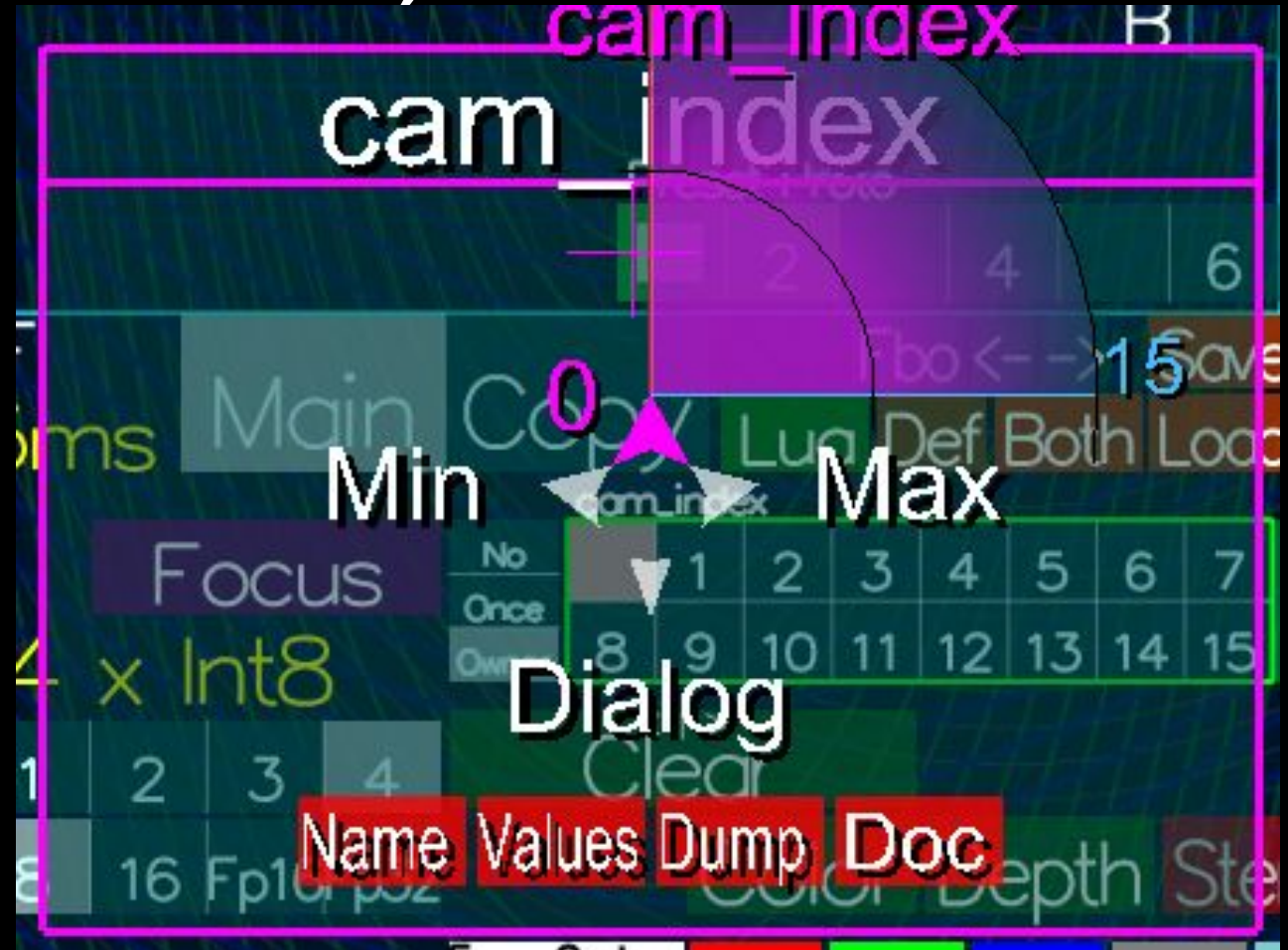
+ - * / → change

Enter → negate

. → floor integer

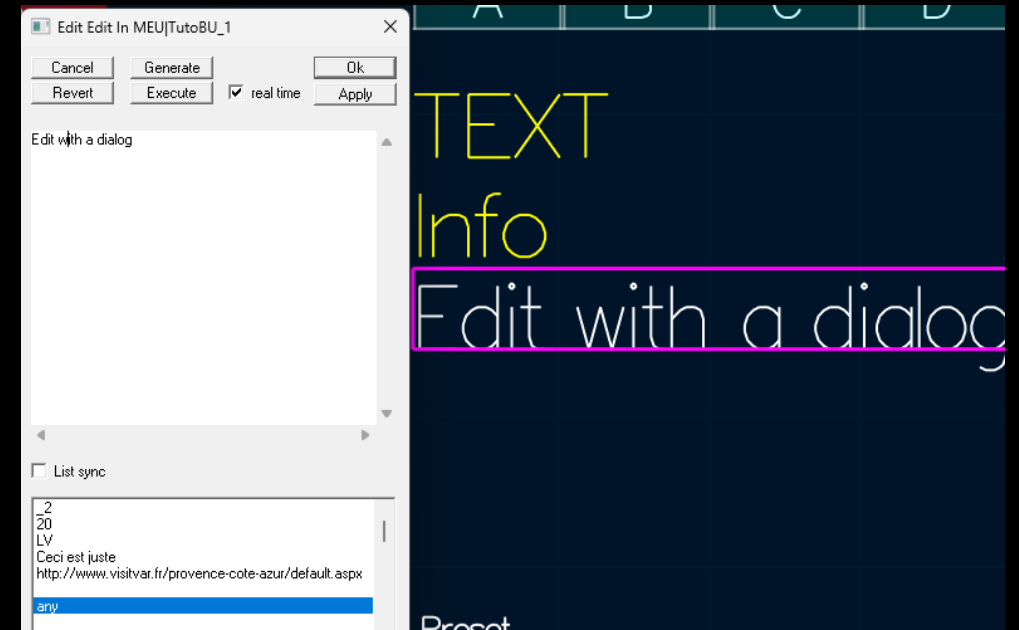
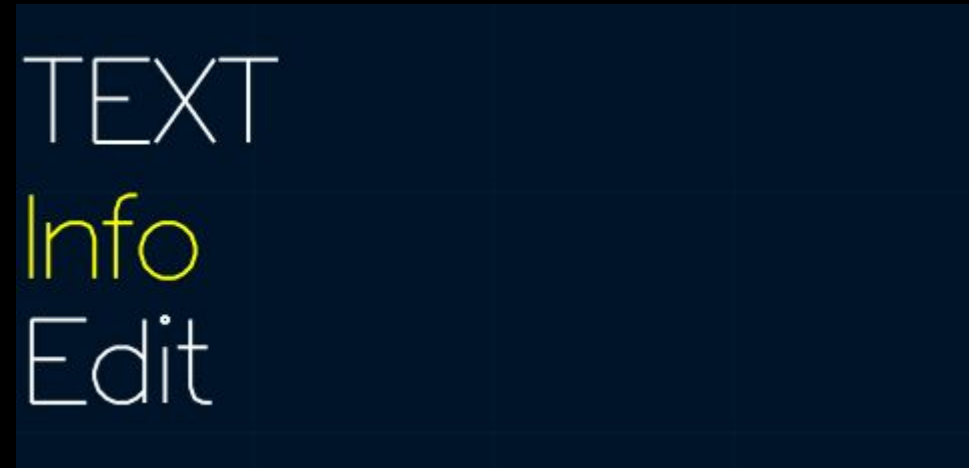
Page Down / Up → Min / Max

Home / End → Default / Default inactive



BU_TEXT

- Editable or not
 - Double Click to Edit
- BU_TEXT INFO
 - Yellow in general
 - display info
- Access to Star Menu
 - like **BUTTON** and **SELECTOR**
 - Quick drag-out
- will Evolve
- Dialog will Evolve too
- Virtual keyboard exists but not functional at the moment (2025 June)



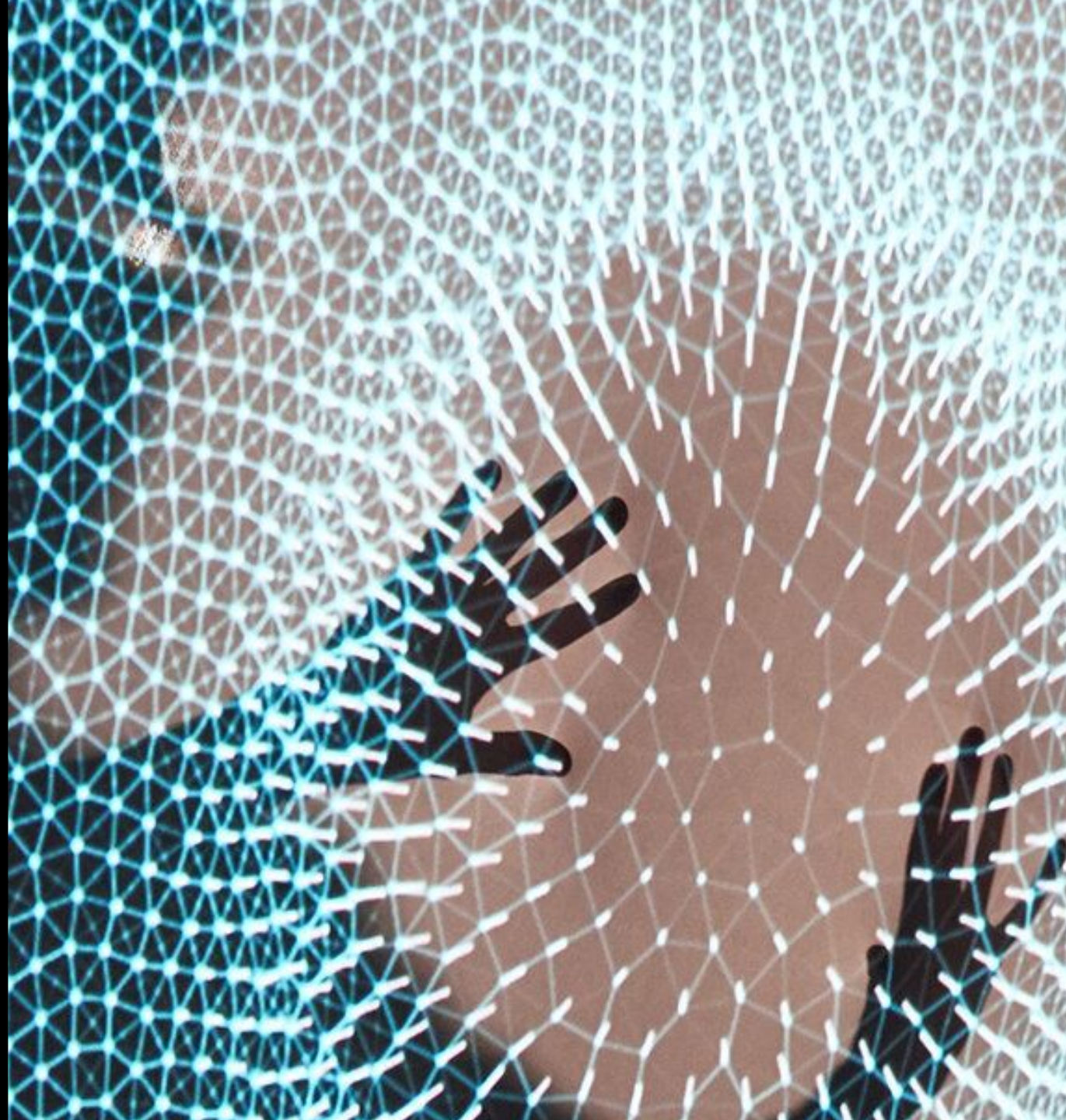
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Part 7:

Meet more BUs

- **Other SLIDERs**
 - SLIDER_XY
 - SLIDER_MULTI
 - SLIDER_CURVE
- **Composite Bus**
 - BUTTON multiple
 - BUTTON menu
- **Copy / Paste**
- **Undo / Redo**



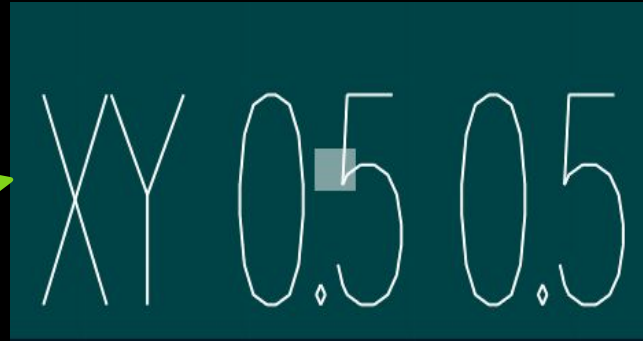
Other SLIDERS

Select More in top Selector to see



SLIDER_XY

2 values x y



SLIDER_MULTI

several x y size_x size_y

Alt to Resize

Double Click to toggle

Key insert → Add point

Key delete → Remove point

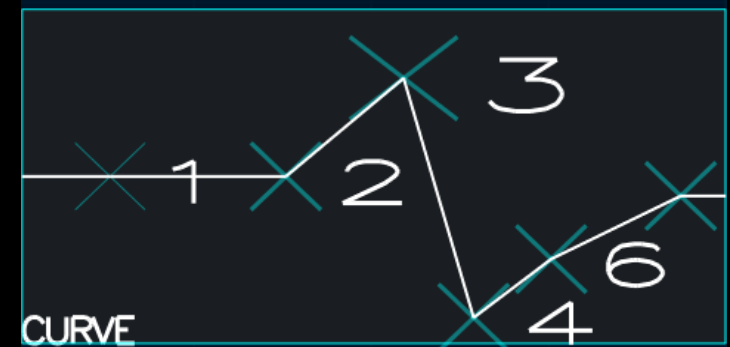


SLIDER_CURVE

linear curve for now

Key insert → Add point

Key delete → Remove point



Composite BUs

- **BUTTON** multiple

< | > at the top

Use a hidden SELECTOR

Click left or right to change

< | >
Option A

< | >
Oui

< | >
Non

- **BUTTON** menu

small rectangle at the top

Use a SELECTOR in an optional **window**

Move window to keep it open

or it disappears after few seconds

Close BU at top right

close the window

▢
Add



Copy / Paste

- **Ctrl c / Ctrl v**
- **Acts on current BU**
- **Shift extend it**

Copy / Paste not ONLY a single BU

but a bu_group or a MEU

see later

need to be refined and documented

Undo / Redo

- **Ctrl z / Ctrl y**
- **Deal with**
 - BU values**
 - BU size and position**
- **Unlimited**
- **One more reason not to be afraid**
 - try things then cancel**
- **Shift Paste Special case (2025 June)**
 - treated as a series of individual actions for now**
 - instead of a global change**
- **Still some bugs (2025 June)**
 - we need feedback to correct !**

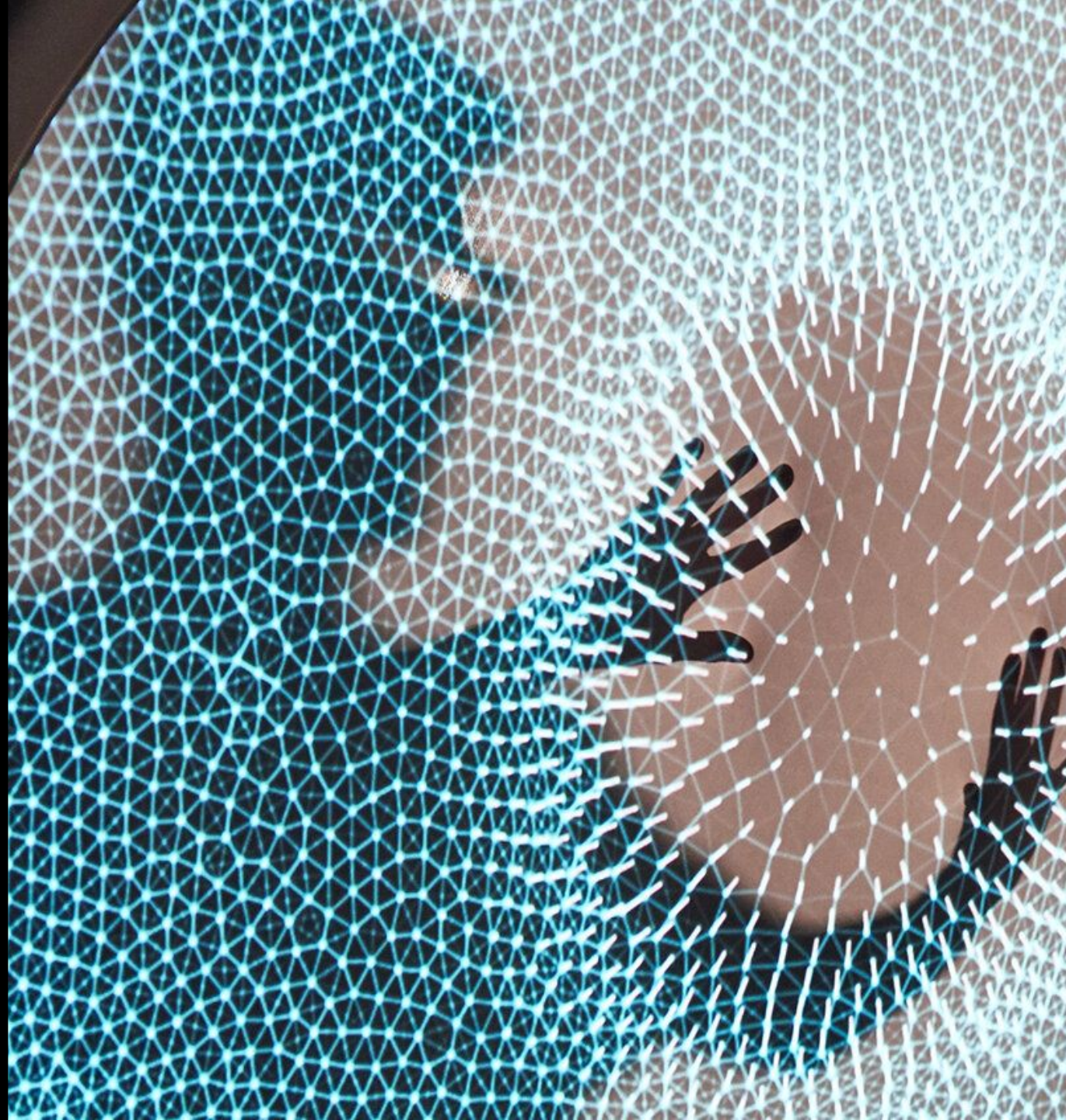
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Part 8:

More BU

- BU_WIZs
- BU_MESS
- BU_SHOW
- Window GA
- Window BU
- Window GP



Some BU_WIZ (Wizard)

- **BU_ALIVE** show/control rendering (toggle with F3)
- **BU_FPS** Frame Per Second **FPS 153 / 145**
FPS in Flatland: can see fps with no UI
- **BU_TIME** show time **23 : 26 58**
- **BU_EYE** show mouse direction
- **BU_CAM** control camear editing **CAM Locked**
- **BU_SEND** control synchronization between machines **NO SEND**
- **BU_MEM** show memory usage in MegaByte **1165**
problem if it increase continuously
- **BU_POWER** show power and plug status **Power : Plugged 92%**
- **BU_BLOB** show number of contacts **-1-**



BU_MESS

```
# LUA : BU_CAM | viz_CAM : ----- GABU_OBJ unused key 9
# LUA : BU_CAM | viz_CAM : did not used key 9
# LUA : GARDEN | garden : try to use key 9
# LUA : GARDEN | garden : do_key( key=9 )
# LUA : do_key( self=GARDEN | garden, key=9 )
# LUA : GARDEN | garden : ----- GABU_OBJ unused key 9
# LUA : GARDEN | garden : did not used key 9
# LUA : GA | SINGLETON : KEY NOT USED 9
# LUA : GABU.do_key_custom_def() key 9 Unused
```

Mess

Scroller

Try Double Click

Key m for (m)essage window / Terminal

Scroller is a **Slider** to **move** in the history of **messages**

Messages color have a **meaning**

Error

Trackers (devices plugged, sending information to AAASeed: Midi, Camera, Captors...)

Debug

Info

BU_SHOW (Debug Tool)

```
Multi blob_nb->0  
BUSSof_GA_top_top->0/0  
BUSSof_GA_top->220/0  
BUSSof_GA_regular->7/7
```

More and more **Red** Message for **errors show** there

Accessed in Lua using `aaa.show(value, name)`

Window GA first look

- **Global Action settings**
- **For now**
 - **UIF (UI Fast for StarMenu)** → enable the **StarMenu**
On Shift → **Enables StarMenu on Shift Click Only**
 - **Help Show** → same as **F1 / Ctrl h**
 - **Grid Top** → draw a **8x8 unit grid** on top of the UI
 - **Size** → set the **2 sizes** used by **Ctrl Tab**
 - **Menu Time Alive**
how long a button menu stay on
 - **BU_SHOW Time**
how long an element stay in **BU_SHOW**
 - **Finger**
What I use in these videos to **show the mouse**
 - **Far draw Less** → **simplify** drawing with mouse distance
a way to optimize UI display
 - **Only Mouse** → discard multitouch input
- **Rest will be detailed later**, mainly used by **developers**
- **Ctrl S, Esc/Esc Save it**
file **AAA_Ga.bus** in the APP folder

☒ UIF
 ☐ On Shift

☐ Help show
 ☐ Grid Top

☒ 8 Size 12
 ☐ Menu Time Alive 4
 ☒ BU_SHOW Time 5

☒ Finger
 ☐ number
 ☒ as lines

☒ Far draw Less
 ☒ Only Mouse

☐ Spy
 ☐ LuaJit
 ☐ LuaJit_dump
 ☐ Visudization

☐ Offset X 0
 ☒ Offset Y 0

Verbose

MEU FILE			
UIF			
GA			
BUSS			
BUS			
BU			
BUI			
BUTTON			
UNDO,REDO			
BLOBS			
BLOB			
EVENT			
VIDEO			
IMGS			
APP			
MUS			
MU			
MEU			
MEDIA			

Window BU

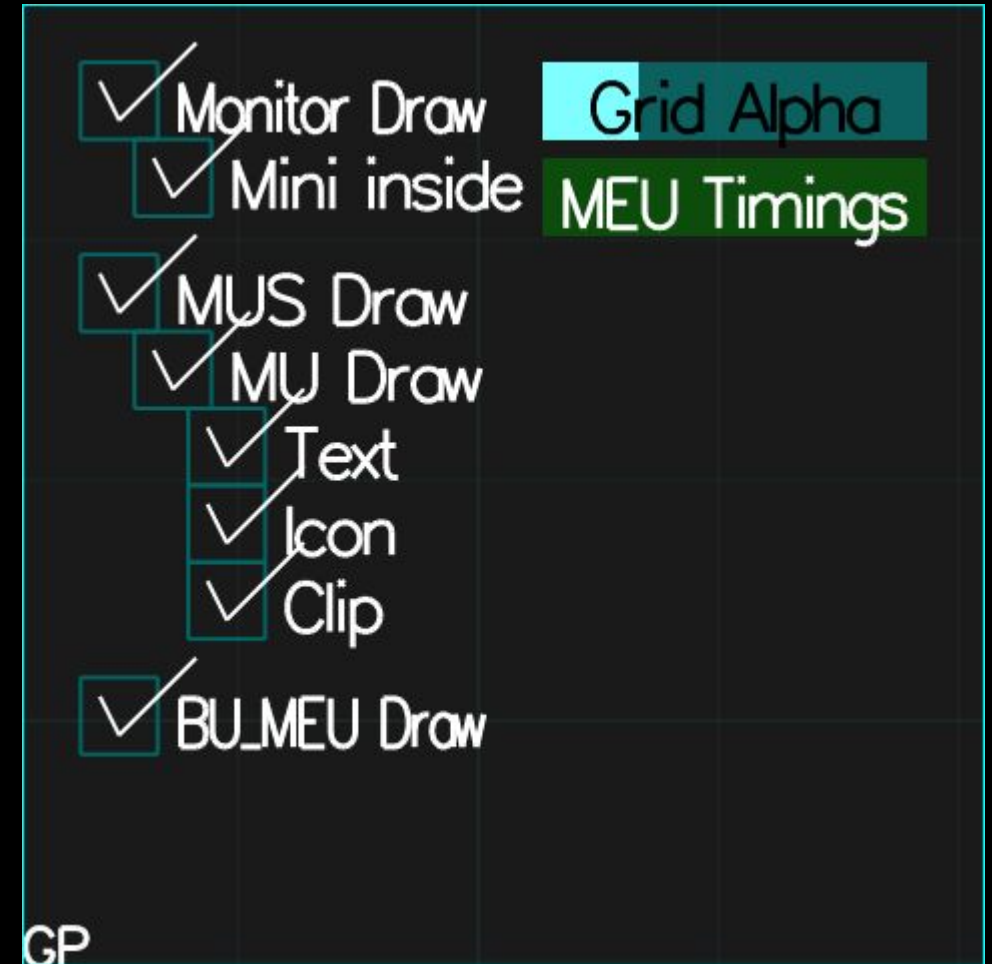
- **Box User settings**
- Most of these Options for developer graphic debug will have a specific tutorial
- Line Width → Text line width
- **Ctrl S, Esc/Esc Save it**
file AAA_Bu.bus in the APP folder

BU

<input checked="" type="checkbox"/> Draw Regular	<input type="checkbox"/> Graphic Debug
<input type="checkbox"/> Draw in Lua	<input checked="" type="checkbox"/> Plain
<input type="checkbox"/> Coordinate	Alpha 0.125
<input checked="" type="checkbox"/> Text	<input checked="" type="checkbox"/> Border
Maa Nice	Alpha 1
Line Width 3	<input checked="" type="checkbox"/> Class
<input type="checkbox"/> Text Rect	<input type="checkbox"/> Name
<input type="checkbox"/> Draw 3D	<input type="checkbox"/> Contact Nb
<input type="checkbox"/> Texture Custom	<input type="checkbox"/> Link
<input type="checkbox"/> Main Rect Only	<input type="checkbox"/> Invisible
<input checked="" type="checkbox"/> Draw all	<input type="checkbox"/> Inactive_ui
<input checked="" type="checkbox"/> Before	<input type="checkbox"/> Inactive
<input checked="" type="checkbox"/> Back	<input type="checkbox"/> Focus
<input checked="" type="checkbox"/> Draw	<input type="checkbox"/> Dump
<input checked="" type="checkbox"/> Fore	Dump Level 4
<input checked="" type="checkbox"/> After	

Window GP

- **GP** come from **Garden Party**
first time the **MEU/MU** interface was used, it was at **Garden Party** (Utram a french company)
- Mainly drawing switches
use for debug or optimization
- Grid Alpha
transparency of the grid displayed under the UI
drawn only if superior to 0
- MEU Timings
Toggle MEU timing measurements
if an application render a lot of MEUs it could alter the frame rate, and so, setting it to off will make the rendering faster.
- Ctrl S, Esc/Esc Save it
file AAA_Gp.bus in the APP folder



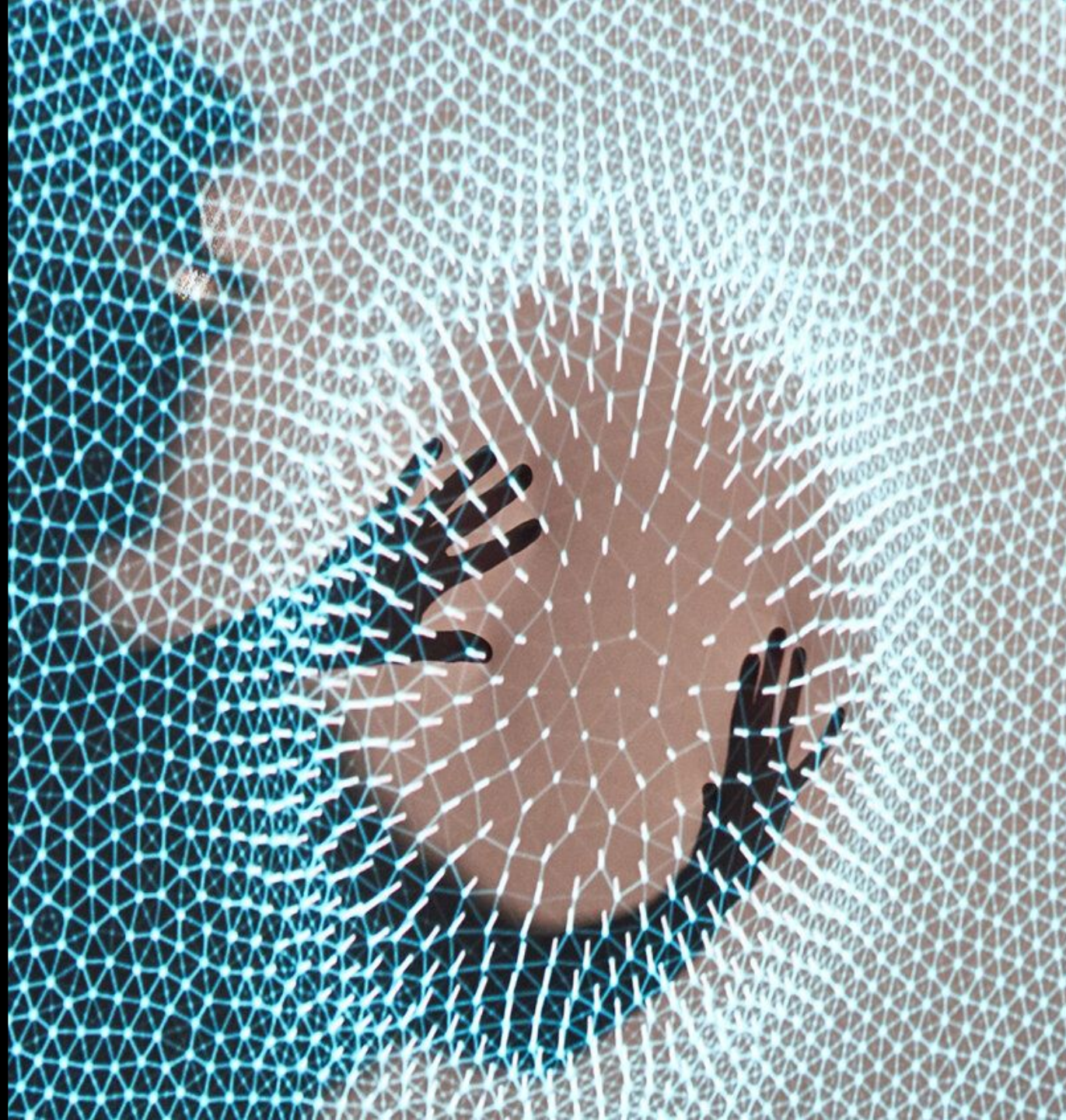
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Part 9:

MEU

- MU / MEU
- MEU and Uix
- MEU Bar
- MEU Preset
- MEU StarMenu



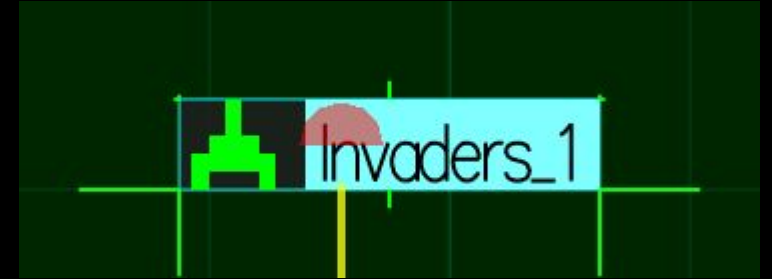
MU Module Unit

MEU Module Editable Unit

- MEU is the base to encapsulate and manipulate functionality
- MU compact part of the MEU



- slider value is the alpha of the MU / MEU
 - Click on slider → StarMenu Slider but also MU
 - Click on icon → move
 - Alt Click → move/resize
- State and Position of the MU control the rendering order
 - Slider value more than 0 → On
 - control transparency when applicable
 - vertical first: **bottom to top**
 - then horizontal: **left to right**
 - orange line** shows the **rendering chain** (more later)



MEU and Uix

- Click on MU icon → MEU in UI5
UI5 by default
UI6 Folder/Directory default
- Links show related MEU / MU
- MU StarMenu to choose UI
- MEU StarMenu click on background
- Close BU at top right
- Red Background ↔ not rendered
- Uix are technically BU_MEU
- Drawing change with distance
speed optimization



More on MEU

- MEU is a **module** of functionality,
in computer terms it is an **object**
it **usually renders** but can be otherwise
receives/send data
analyses image
control a device (e.g. plotter, projector, Dmx, Arduino...)
...
- **2 main methods** (function) are called every frame by a **render() method**
 - **update ()** prepare so draw() will be as fast as possible
 - **Draw ()**
- **1 method** is called when the **MEU UI is visible**
 - **update_ui ()**

MEU real nature, a peek for now

- It is a **Lua object**

Name is `MeuType_InstanceName`

a lua Script for each Type / Class / Prototype

- It uses a **C++ AAASeed Object**

a `c_obj_ui`

`c_layers` or `c_module`

Accessible via its flatland param and some dedicated lua methods

- It lives in a **directory**

Everything is readable and can be edited

less and less needed

but some like it

MEU Bar



- TutoBU_1 **Title** (white or green if current)

MEU_name made of **type** (left) and **instance** (right):

- S UI UD **buttons**

switches to activate/deactivate

Send update_UI Update and Draw

- 0.032ms **Execution time** in millisecond

- BaseMore ... is a SELECTOR named TAB

switch between different block of UI

- X **Close button** close the **MEU UI**

MEU Bar



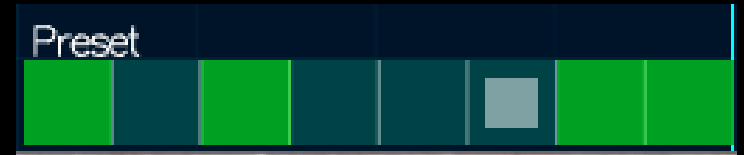
- **Lua** Open the **lua** script that the MEU use in an associated text editor
- **Load** Load only the MEU state
- **Save** Save only the MEU state
- **Def** Trigger a **Definition**, in fact a redefinition of the MEU (its UI in particular)
- **Both** Trigger a **Definition** and a **Load** **<- ->**
- **Fbo** Open the used **Fbo** (more soon on Fbo) in the previous **UIx**
- **<- ->** lets you navigate in the rendering chain (more soon)

MEU Preset

- At the bottom right of the MEU
- **Load/Save the state of a MEU**
in fact load/save the values of included BUs
not always all, at the author discretion



- **preset defined** ↔ **green color**
- **Click** **Load**
- **Ctrl Click** **Save**
- **Ctrl Alt Click** **Delete**

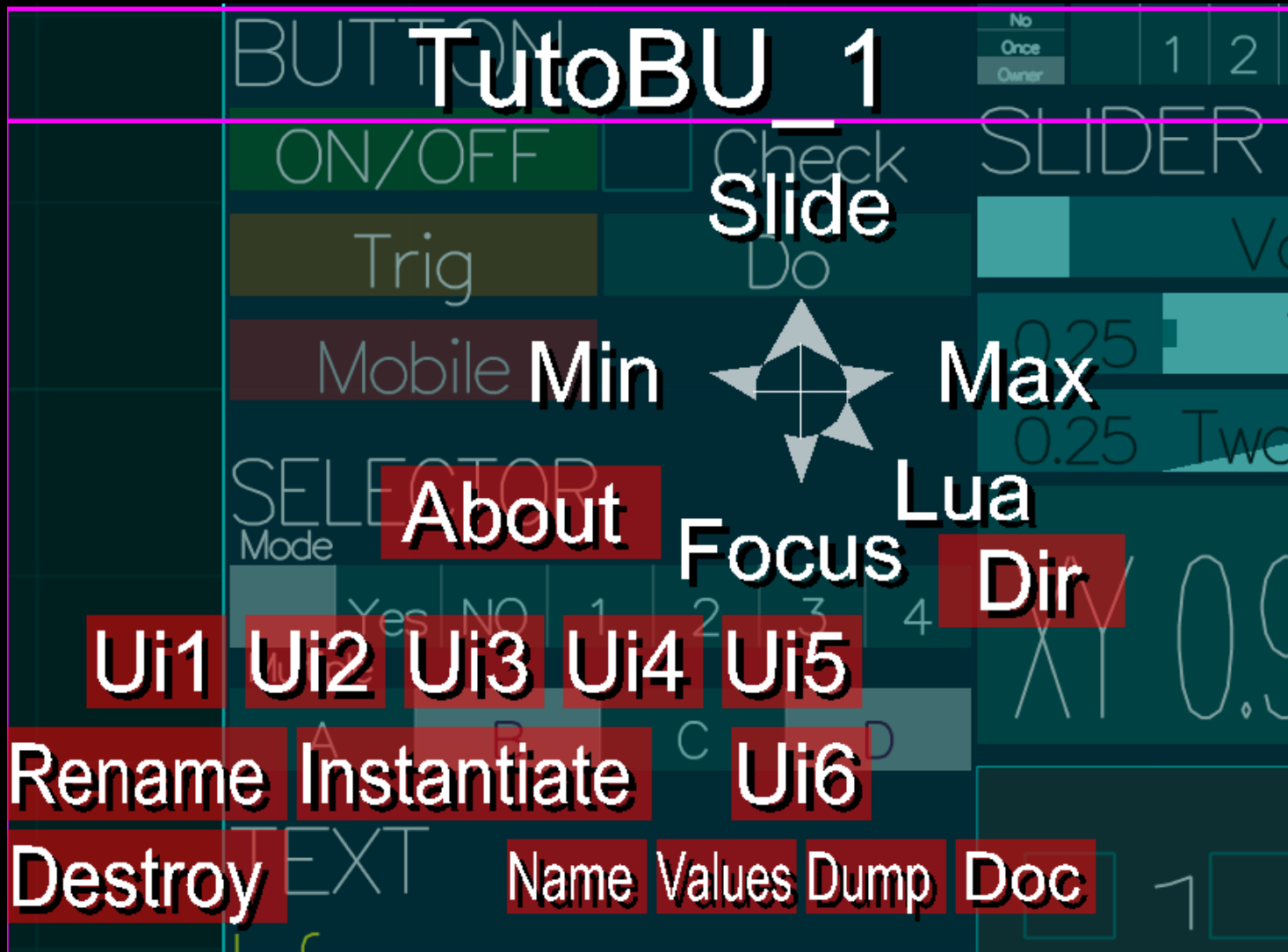


- Fixed number by MEU Type
defined in the code for now (2025 April)

Preset							
			4			8	12
		16			20		24

Developer Note: function meu:get_preset_nb() return 24 end

MEU StarMenu



Click MEU background or MU slider

Slide

Adjust the alpha

Same as the MU Slider

Focus

Access to Flatland

C part of the MEU

Lua

Access to the Lua script

Using default editor

Dir

Opens the Instance Folder

Uix

Choose BU_MEU for UI

Rename

Type Name can't be changed

Destroy

with Confirmation Dialog

Instantiate

Duplicate

Type Name can't be changed

AAASeed

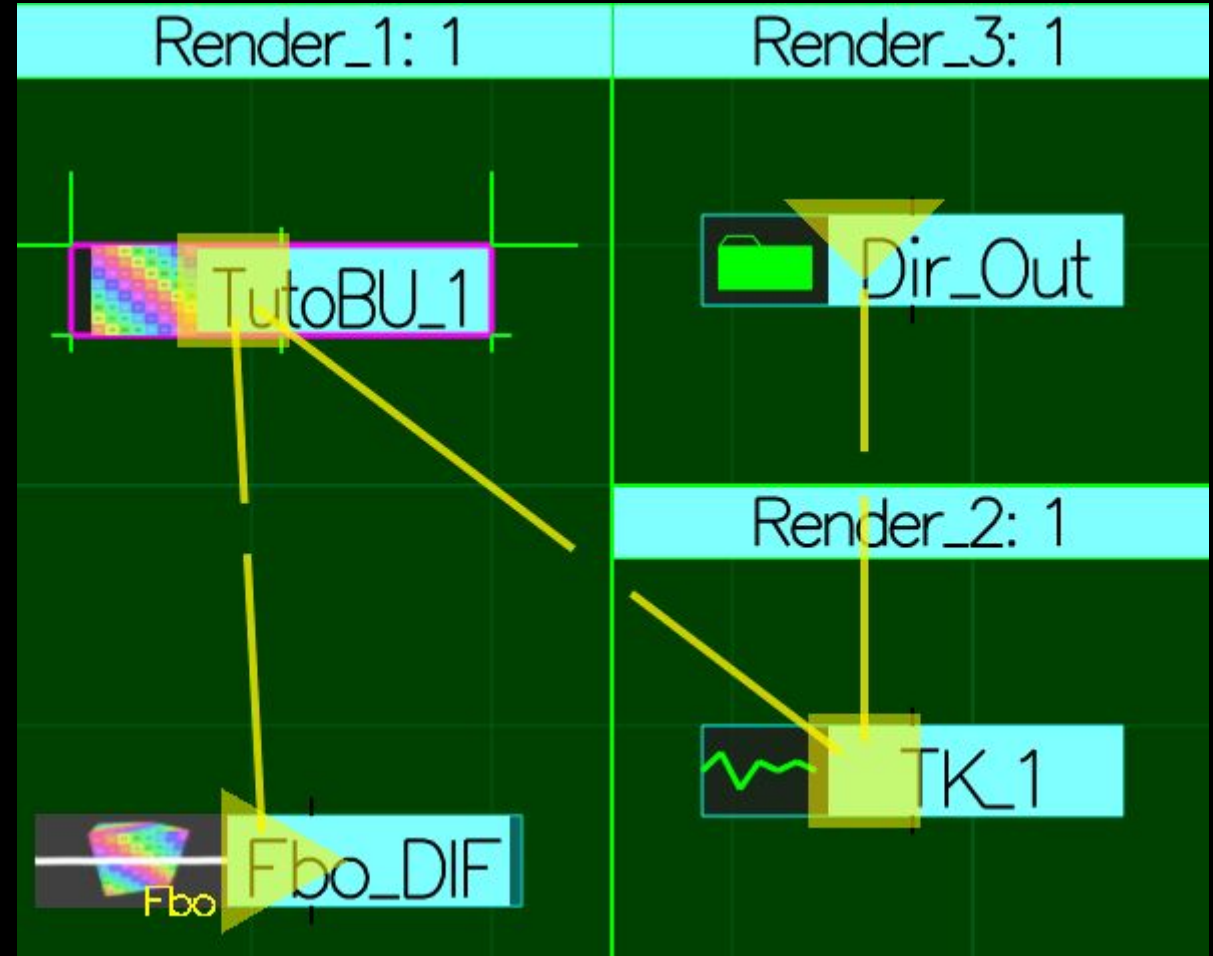
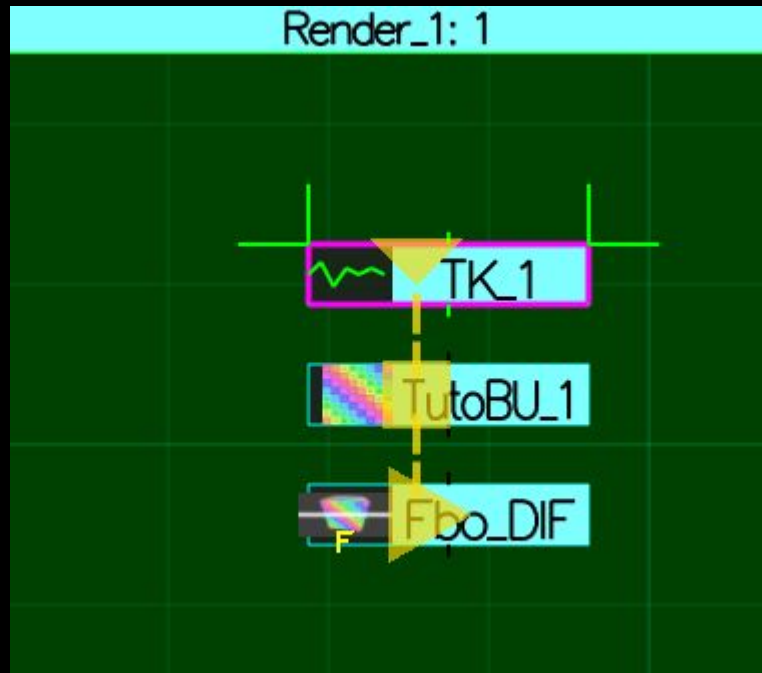
An introduction

Part 10: Rendering chain

- Rendering chain and BU_RECT
- MU Slider / Alpha
- BU_RECT

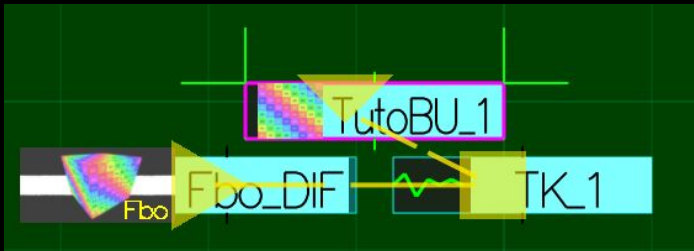
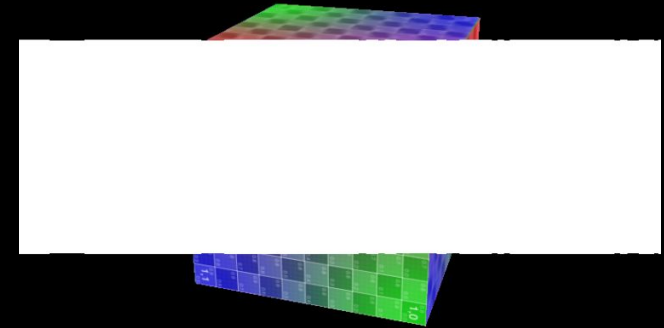
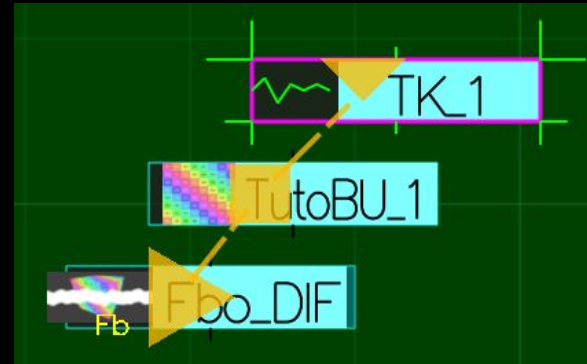
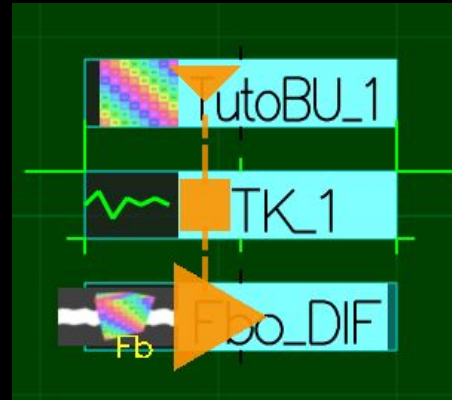
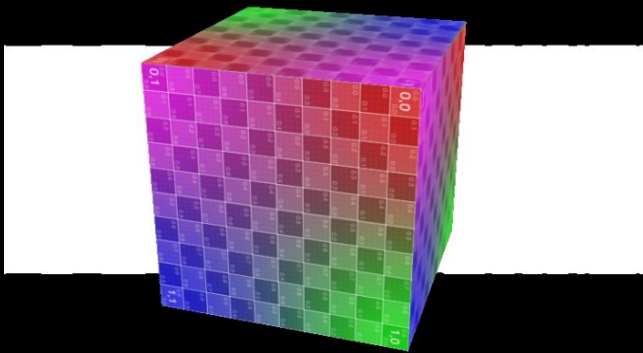


Rendering Chain and BU_RECT



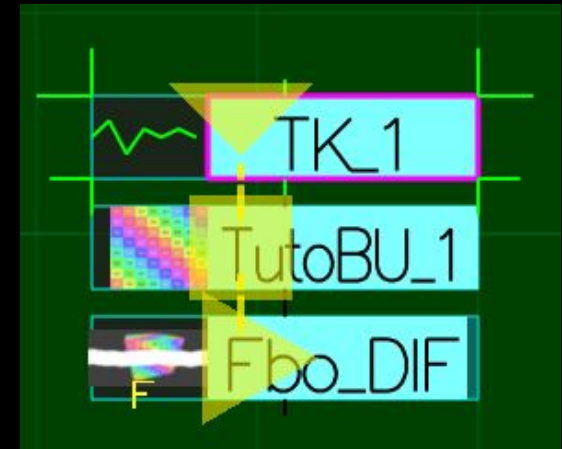
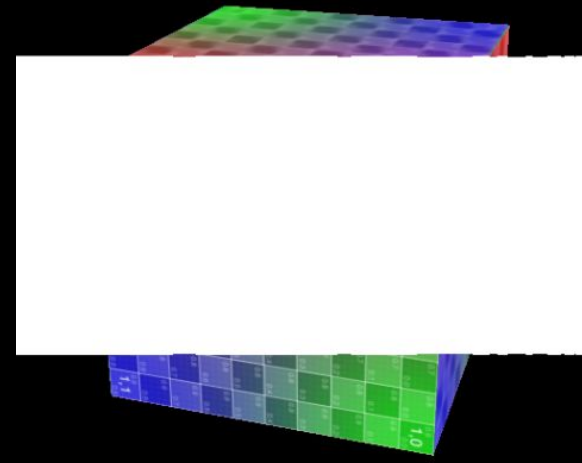
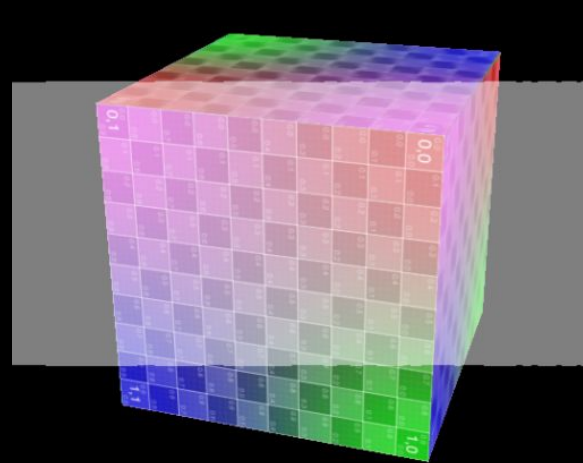
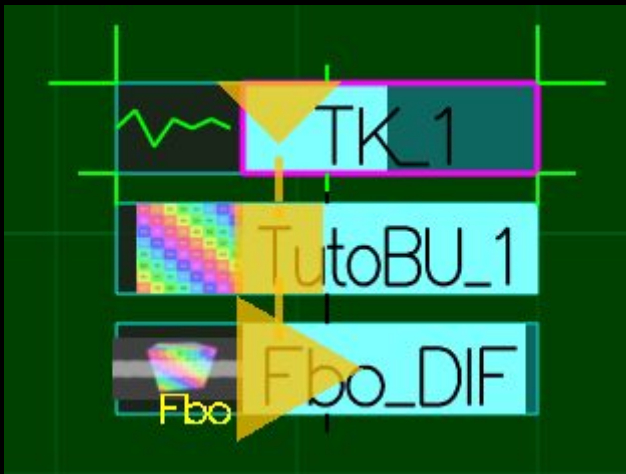
Rendering chain

- **State and Position** of the **MUs** control the **execution order**
rendering order when MEU do rendering
- **bottom to top**, then **left to right**
- orange line **not a cable** just a **visualisation** of the rendering chain



MU Slider for Alpha Opacity/Transparency

- **MEU/MU** slider value more than 0 → **On**
- when possible this value is the alpha level of the **MEU** (Opacity)



Rendering Chain BU_RECT

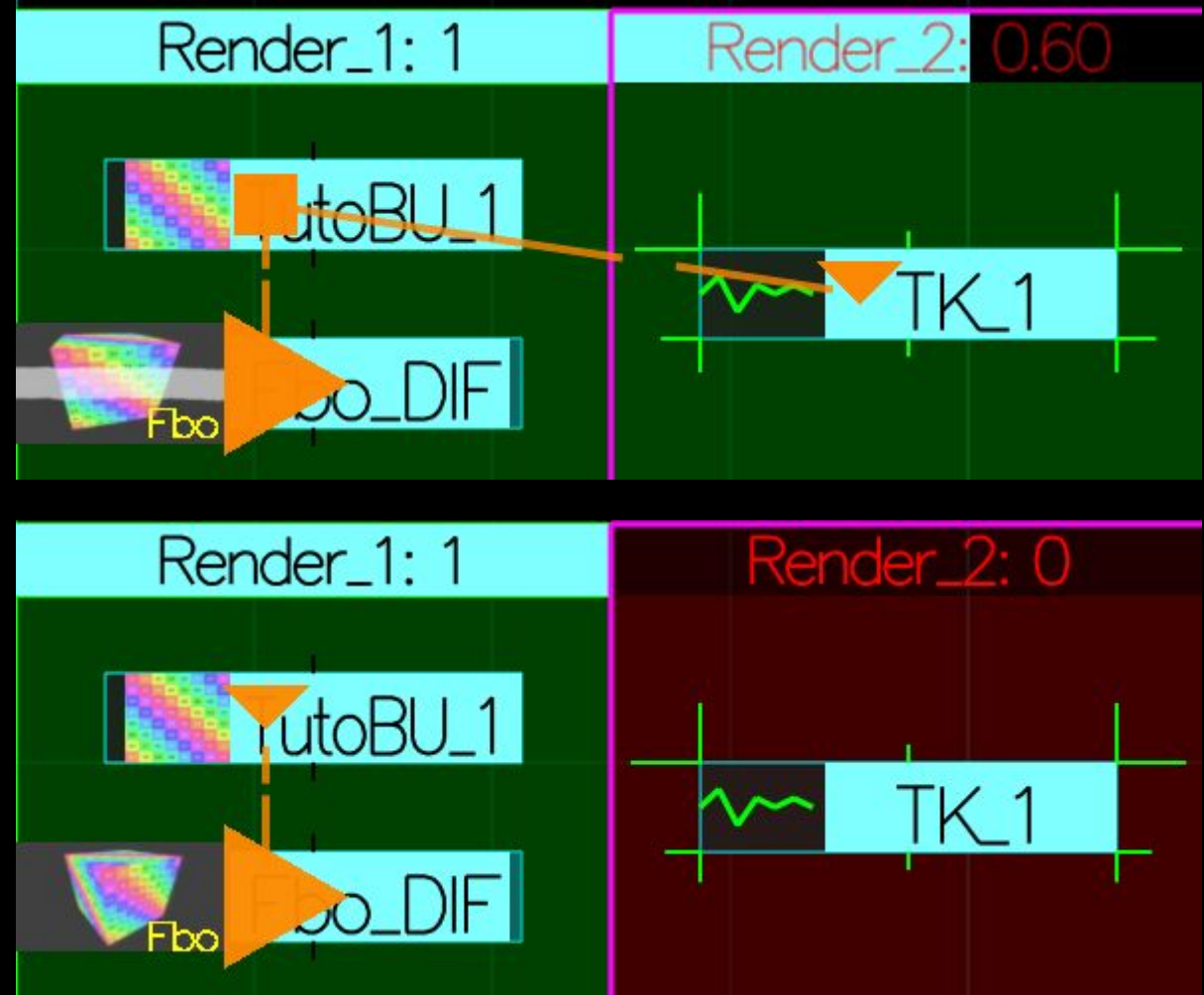
- **First**
 - **Order of the BU_RECTs**
 - **Number in Name**
 - **Change**
 - **StarMenu**
 - **Keyboard**
 - **Ctrl Up / Down**
- **Second**
 - **Order in the BU_RECT**
 - **Bottom to top**
 - **Left to Right**



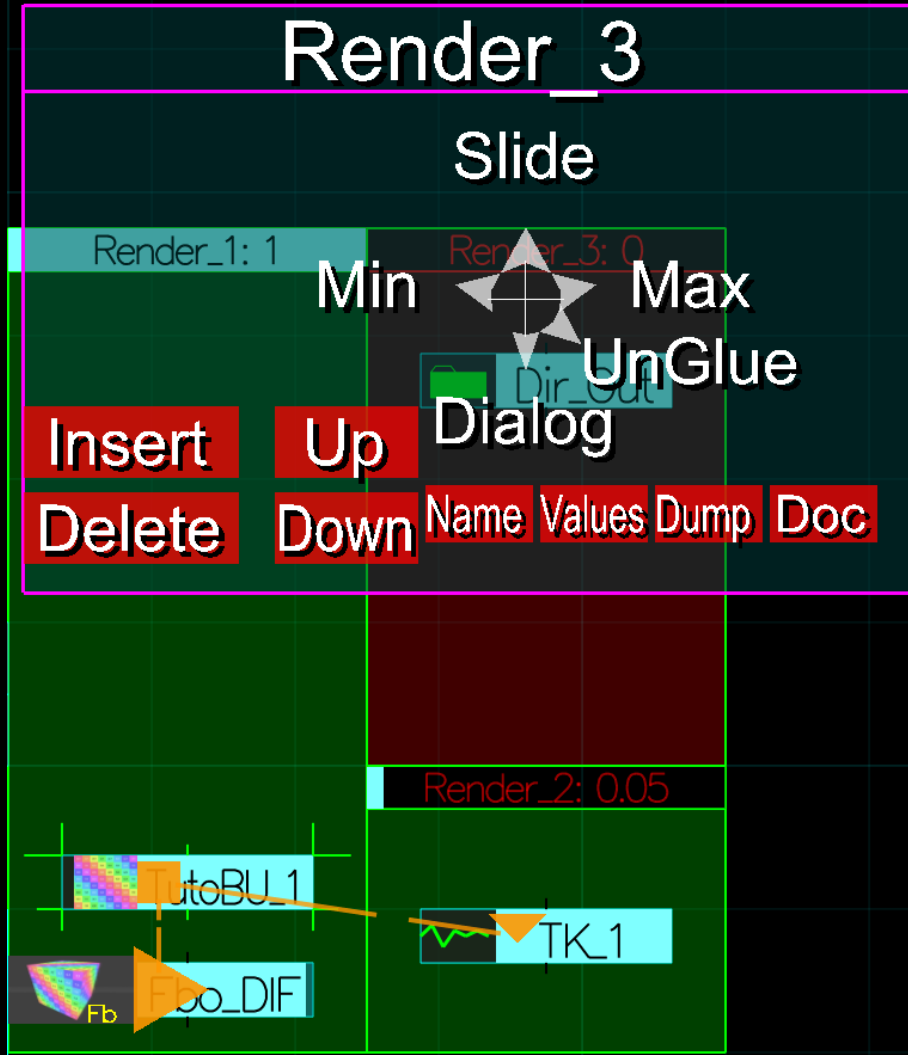
Rendering Chain BU_RECT

BU_RECT value

- multiply MU Value
- Inferior or equal zero
→ Inactive



BU_RECT StarMenu



- **Slide** to change value
Alpha for BU_RECT
shown like Slider at the BU_RECT top
Red when not 0 or 1
keyboard like a slider
- **Insert / Delete**
Ctrl Insert / Del
- **Up / Down Order**
Ctrl Arrow Up / Do
- **Glue / UnGlue**
Affect MUs inside when moved
But not when resizing

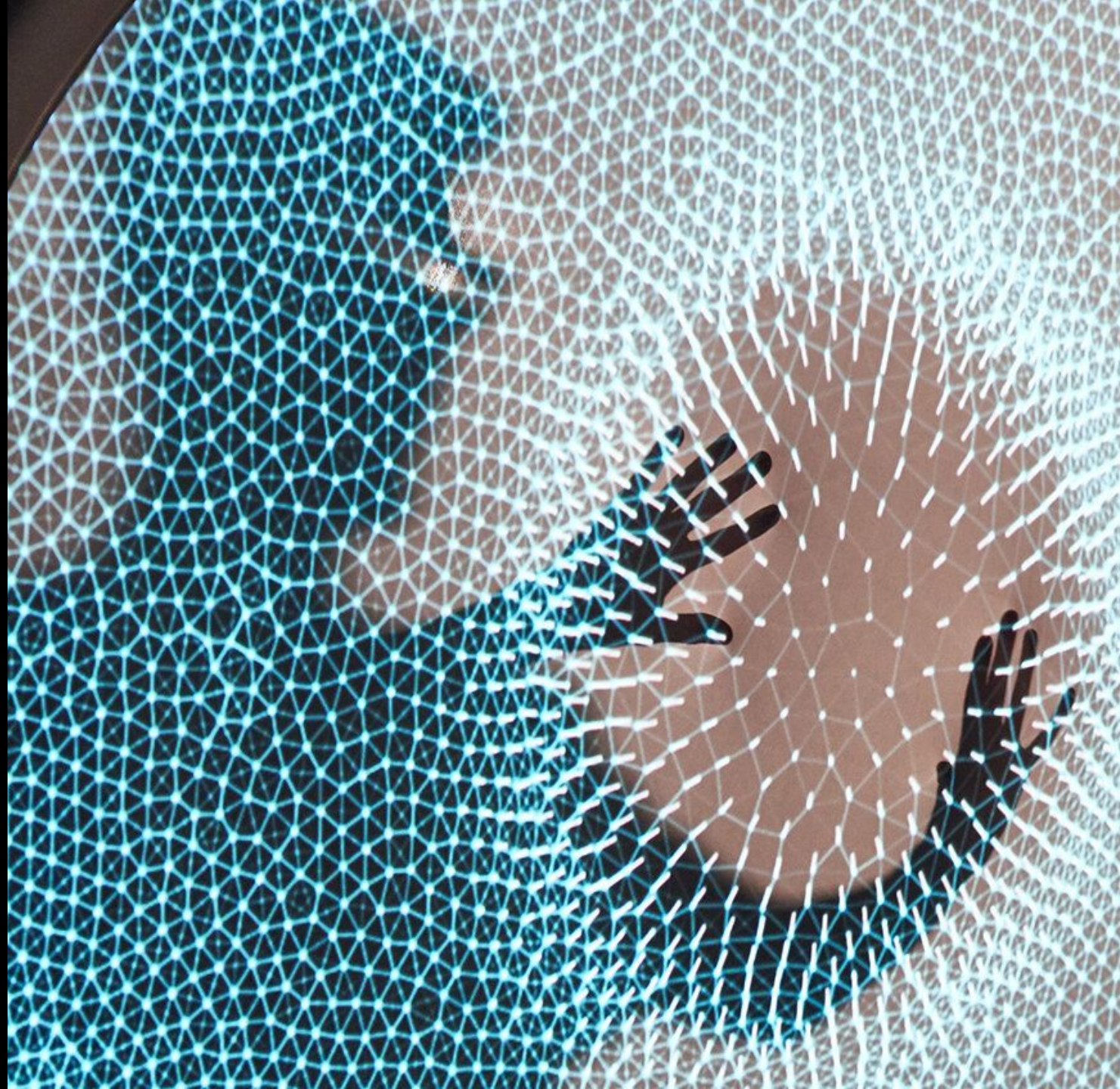
AAASeed

An introduction

Part 11:

MEU more

- MEU Seen
- MEU Find
- MEU_DIR

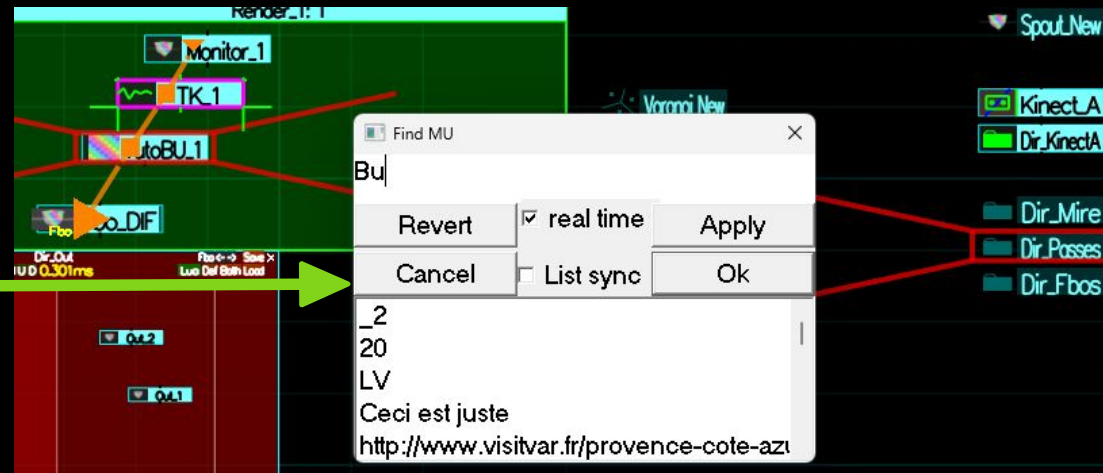


MU Seen and MU Search

- 3 Buttons to select MUs we see Hidden Unused Used
 - **Hidden** display in the hide attribute by MU is on
 - **StarMenu** on **MU**
 - **Shift Ctrl** on **Icon**
 - **Back color** is red
 - **Unused** display the **MU** having a **slider/alpha** equal 0
 - **Used** display the **MU** having a **slider/alpha** greater than 0
 - A way
 - to simplify the display
 - To keep MUs around

- **Find MU/MEU**

- **Ctrl F** like **Find**
- **highlights** matching MUs



MEU_DIR



- **Encapsulates other MEUs**
 - A way to regroup and control
 - a AAA_MEU Folder
- **Render Chain** inside
- **Open in UI6** by default
 - More easy to navigate the MU inside
 - to simplify the display
 - While keeping MU around
- No BU_RECT
 - but 2 optional areas A and B
- Can drag MU in and out
 - **Ctrl Drag** do Instantiate

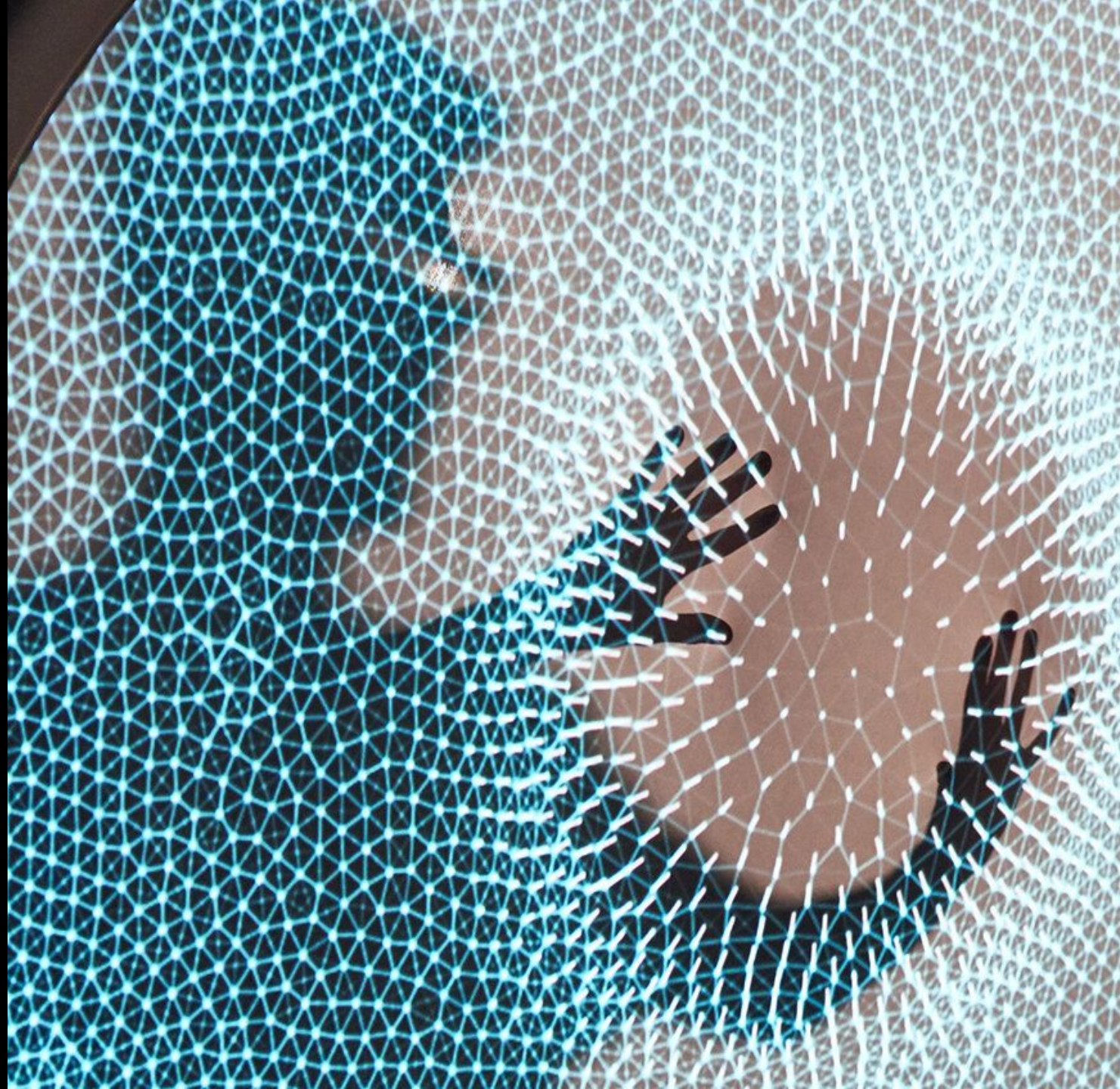


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Part 12: Cameras & Axe

- Cameras
- Axes



MEU Cameras

- **No / Once / Owner**

- **No**: use current camera
last one defined in the rendering chain
- **Once**: use camera only for this MEU
then go back to current rendering chain camera
- **Owner** : Own its camera
it becomes the current Camera for
the Meus following in the rendering chain

- Camera selector

- Button **Axe show**

cam_index								
No		1	2	3	4	5	6	7
Once								
Owner								

cam_index								
No								
Once		1	2	3	4	5	6	7
Owner								

- Reminder: StarMenu → name

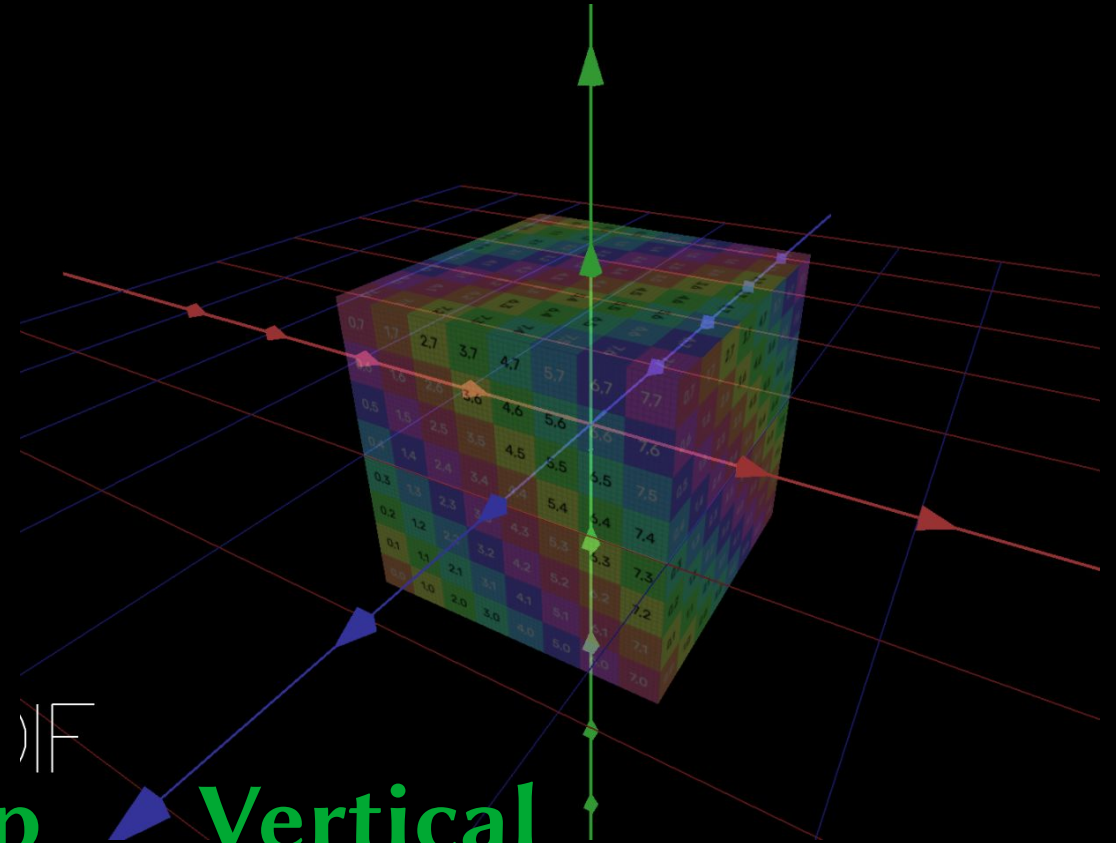
Camera Selector



- **Click** **Select**
- **Ctrl Click** **Write to**
- **Ctrl C/Ctrl V** **Copy / Paste**
- **Shift Click** **Lock / Unlock**
- **Double Click** **Edit in flatland**

Camera Axes Units

- **Right Hand System**
like OpenGL
not left hand
- **Z in your face**
- **2d : XY** facing you
- **X|Red** **left to right**
- **Y|Green** **bottom to top** **Vertical**
- **Z|Blue** **back to front**
- **No unit: Mathematics** not physics
 - Back of the pyramid aligned with unit



Camera Edit

- **Middle Click → Start Editing**
 - BU_CAM will manifest if locked
 - BU_CAM locked
 - Or camera itself locked
 - When editing
 - **Wheel** **Dolly**
 - **Mouse** **Rotate**
 - **Middle Click Drag** **Move**
 - **Key o** **Flip (o)rthogonal vs perspective**
 - **Key x|X y|Y z|Z** **Align front | back**
 - **Ctrl Shift F4** **Reset**
 - **F4** **Focus in Flatland**
- **Left Click → accept edit**
- **Right Click → cancel edit: go back to start position**

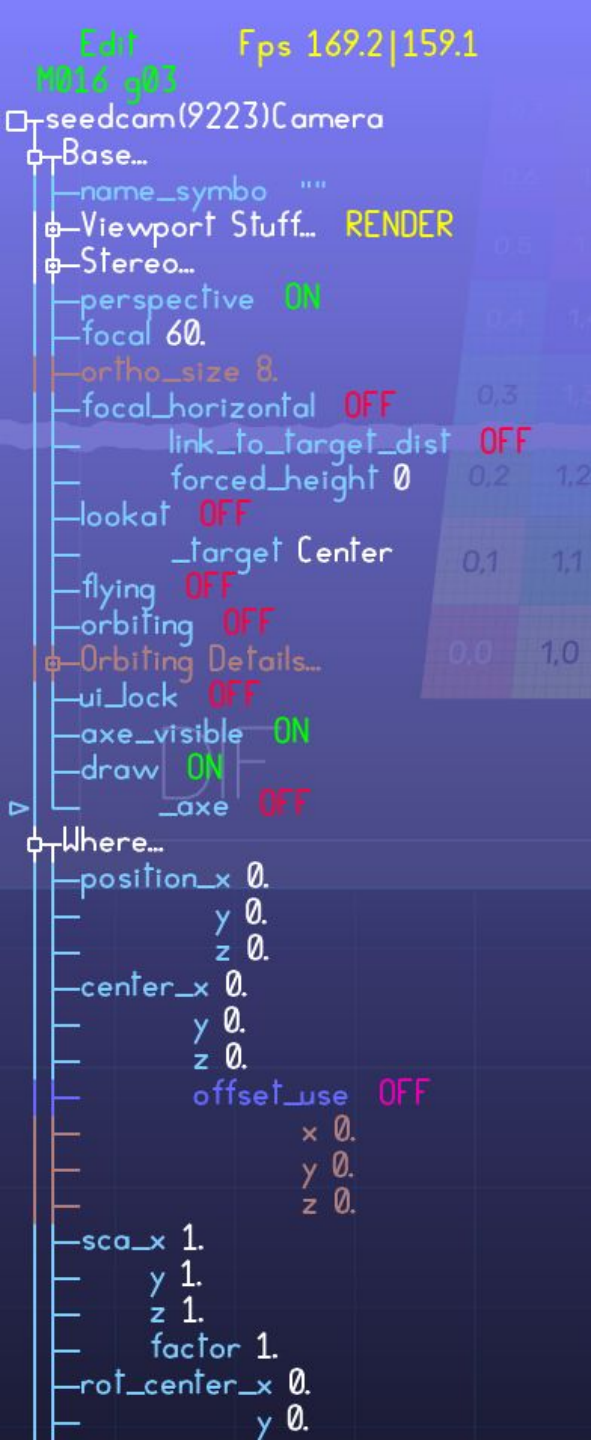
AAASeed

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Part 13: Flatland

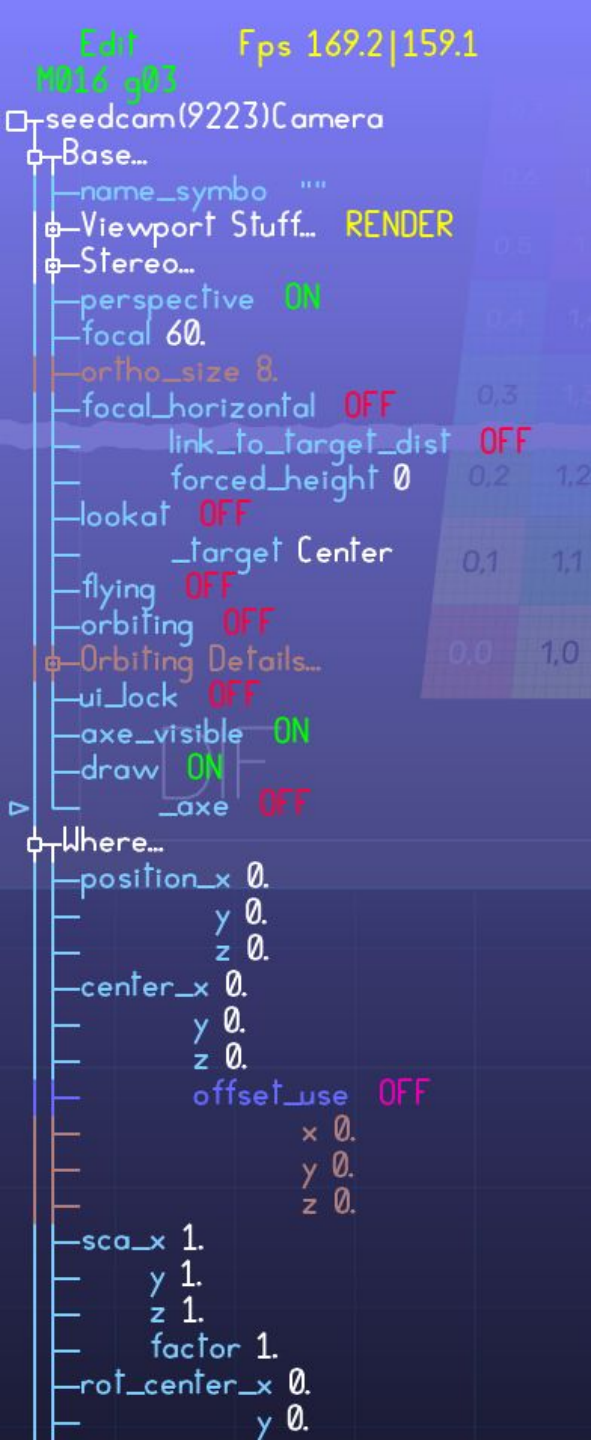
- Flatland
- Params
- Edit Param





FlatLand a little deeper

- Tree Made of params ()
- **Tab** **On/Off**
- **Focus**
 - **F10** **Preferences**
 - **Ctrl F10** **Start preferences**
 - **0** **Application**
 - **Triple n** **Network preferences**
- **Key <- ->** **Navigate in past Focus**
- **Wheel** **Scroll**



Params

Short for **parameter**

Types for now: **bool, integer, float, text, filename**

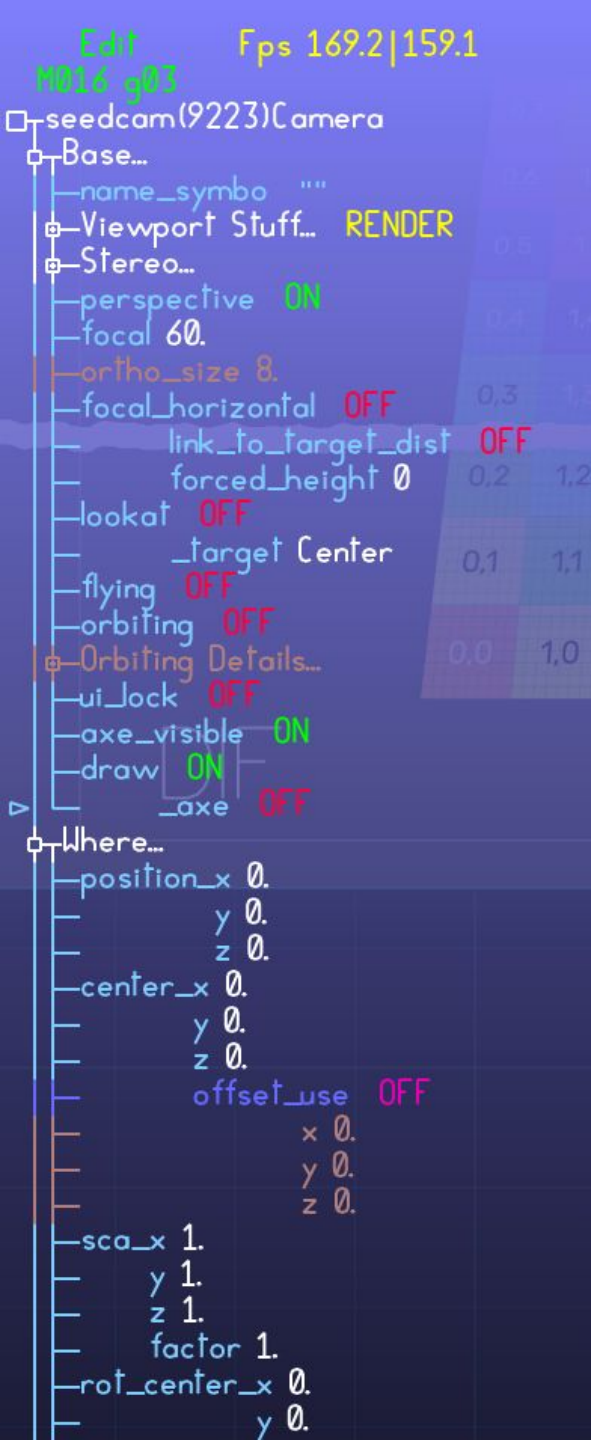
Param draw:

- Box → something under
Big Box → Object
- Param name
Pinkish / Red param → Unused
- Param value
for bool **OFF ON**
- Yellow → Comment / Sum Up

UI

- Click

Left	Select current param and eventually Open/Close
Right	Param menu
- Space Open and Close
- Arrow Up Down Move selection up and down
- Right Click Param menu



Edit params

Mouse

- Bool	Drag left and Right
param_trig	Just touch it
- Integer, Float	Click and turn around
unlimited	
Sensibility	
Ctrl	Slower
Ctrl Tab	Even Slower
Shift Ctrl	Faster
Shift Ctrl Tab	Even Faster
Double Click	Edit
- Text, Filename	
Double Click	Dialog

Keyboard

- Same as BU	
+ - * /	Change
Enter	Inverse
.	Floor integer
Home	Default
End	Inactive
PageUp	Maximum
PageDown	Minimum

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An introduction

Part 14:

Texture and FBO

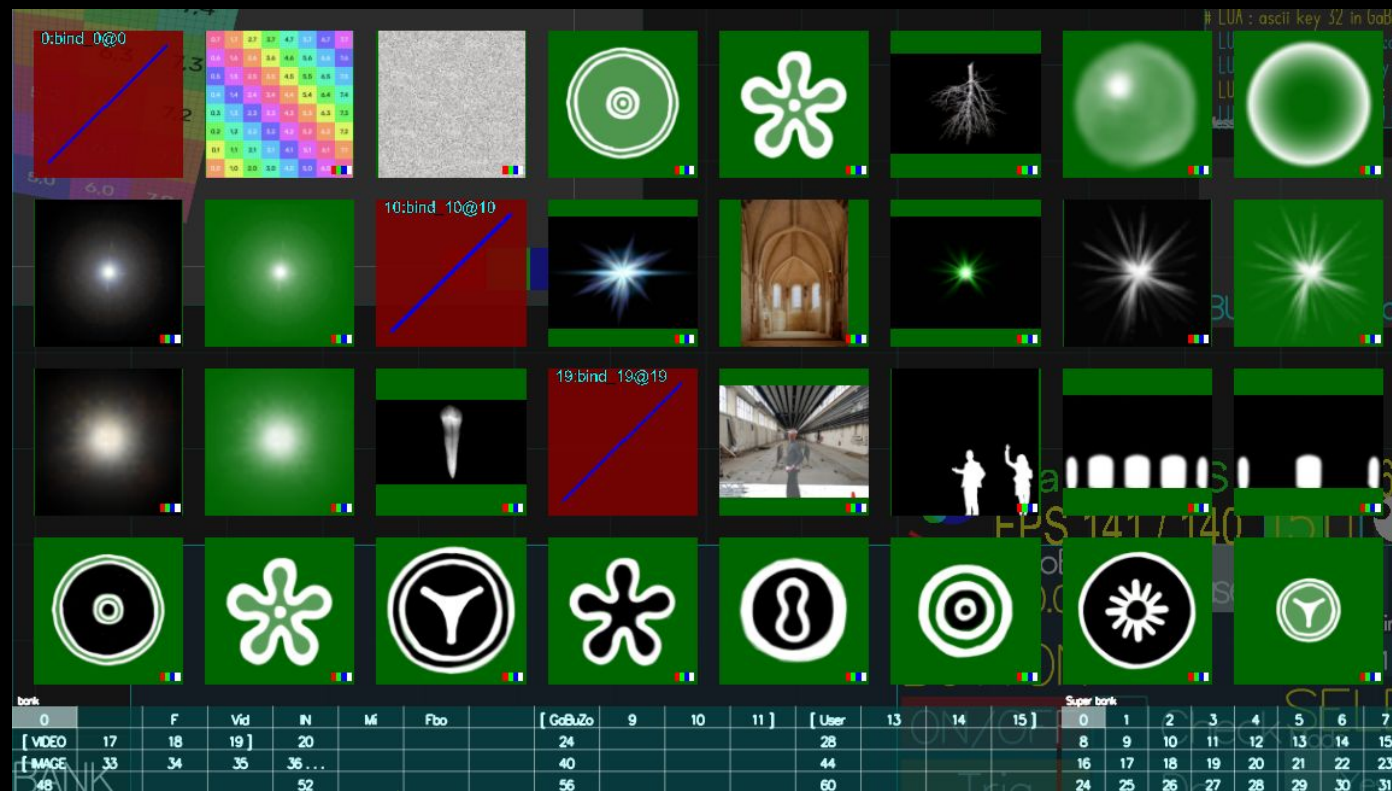
- Create New APP
- Bank of Binds
- BU_TEXTURE
- FBO
Frame Buffer Object
- MEU Fbo
- MEU Monitor



APP: Create a new one by folder duplication

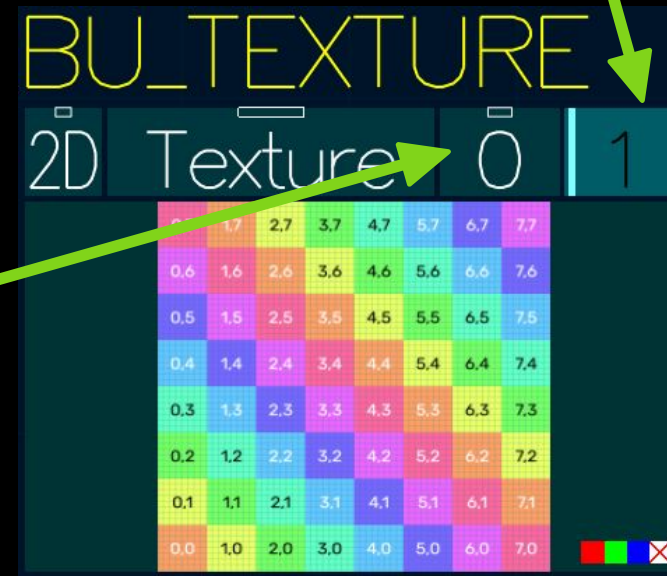
- **Copy** AAAAPPs\Tuto\APP_Garden_Base
- Into APPs_Guest
- **Rename** APP_Garden_Base
- **Open** AAASeed
- **Open** renamed APP

Bank of Bind: BU_TEXTURE



Bank

Bind



BU_TEXTURE

Texture dim X			
no	1D	2D	3D

Dimension
Optional

ShortCut

Texture																X
Video				Fbo				Input				Mire				
A	B	C	D	F1	2	3	4	In1	2	3	4	Mi1	2	3	4	
E	F	G	H	F5	6	7	8	In5	6	7	8	Mi5	6	7	8	
I	J	K	L	F9	10	11	12	In9	10	11	12	Mi9	10	11	12	
Dif	PreDif	R Viz	F13	14	15	16	In13	14	15	16	Mi13	14	15	16		
Albe	Nor	Spec	Emis	ZBuf	Light	Castic	Fog	Dof	Transp	Co	Ray	ToneMap	Fxaa			UMMap

BU_TEXTURE

2D Texture 0 1

0.7	1.7	2.7	3.7	4.7	5.7	6.7	7.7
0.6	1.6	2.6	3.6	4.6	5.6	6.6	7.6
0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5
0.4	1.4	2.4	3.4	4.4	5.4	6.4	7.4
0.3	1.3	2.3	3.3	4.3	5.3	6.3	7.3
0.2	1.2	2.2	3.2	4.2	5.2	6.2	7.2
0.1	1.1	2.1	3.1	4.1	5.1	6.1	7.1
0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0

RGB RGBA

bind

bank

Texture_bind						X
0				4		7
8				12		15
16				20		23
24				28		31

Click Double To Load

Texture_bank														X		
0		F	Vid	IN	Mi	Fbo		[GoBuZo	9	10	11]	[User	13	14	15]	
[VIDEO	17	18	19]	20				24				28			31	
[IMAGE	33	34	35	36 ...				40				44			47	
48				52				56				60			63	

Fbo / Frame Buffer Object

- Concept from Computer Graphics

LearnOpenGL.com

- see it as a **Canvas**

see it as **where we draw**

it regroups textures (image) of the same size

- **Color attachments**, in AAASeed up to 4 (**June 2025**)
- **Depth** attachment (**zBuffer**)
- **Stencil** attachment, exist but **ignore if you are not a specialist**

- **Exposed in GaBuZoMeu**

MEU_Fbo

Special MU display

Fbo flashing

Icon changing size



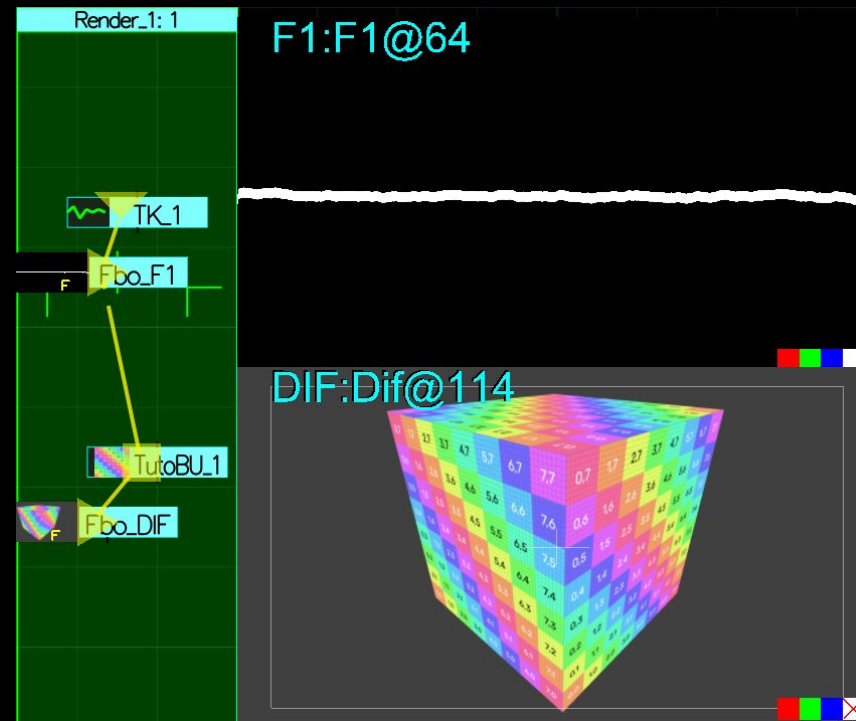
Fbo / Frame Buffer Object

- No Fbo

we draw to the back of the window

- A Fbo

All the successive Meu in the rendering chain use it
until a new one is executed/rendered



MEU Fbo

Ui5 Fbo_DIF Main Copy Fbo <- -> Save X

S UI U D 0.450ms Lua Def Both Load

Active 0 Focus

1920 x 1080 4 x Int8

Size X 1920 Size Y 1080 1 2 3 4

Size / * Swap 8 16 16Fp32Fp

Attachement active

1 2 3 4 Depth

See 1 2 3 4 Depth

Erase Custom

Erase Color

Custom 0 25 50 75 100

R G B Cy Ye Ma

trail 6.046

0

Do Restart

1 from 0

✓ Monitor Center Flip U Flip V

Attachement On Cpu

1 2 3 4 Depth

Attachement to save

1 2 3 4 Depth

Save trig Save

Preset

2 4 6 8

1920 x 1080

Size X 1920 Size Y 1080

Size / * Swap

- Size
- Color format
 - Channel number R RG RGB RGBA
 - Chanel Format
 - Integer 8 bits [0,255]
 - Integer 16 bits [0,65535]
 - Floating point 16 bits, called half
 - Floating point 32 bits

4 x Int8

1 2 3 4

8 16 Fp16Fp32

- Attachments
 - Selection
 - Cpu : transfer from Gpu to Cpu
 - Monitor
 - Active
 - Click Double
 - Save Trig → One frame
 - Save → Each frame

Attachement active

1 2 3 4 Depth

- Cameras
- Erase
 - How, What
 - Colors with presets
 - Trail

<1>

Clear

Color Depth

Erase Custom

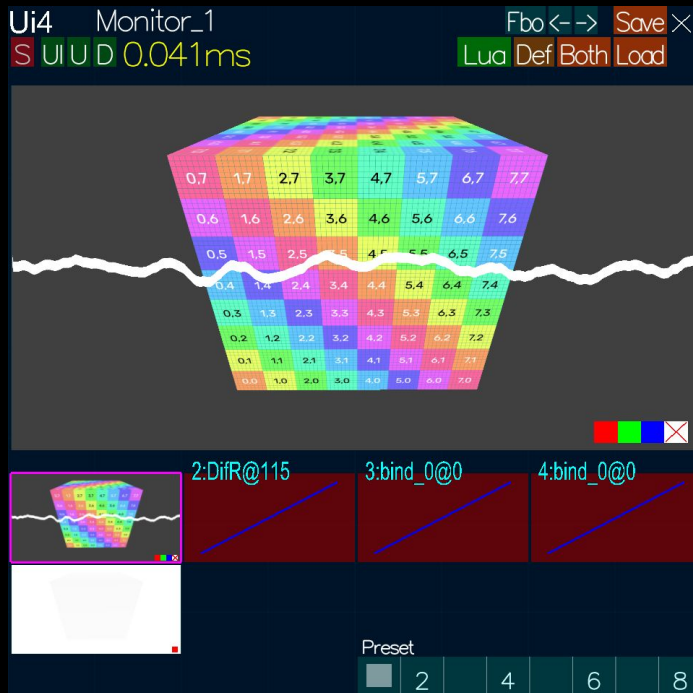
Erase Color

Custom 0 25 50 75 100

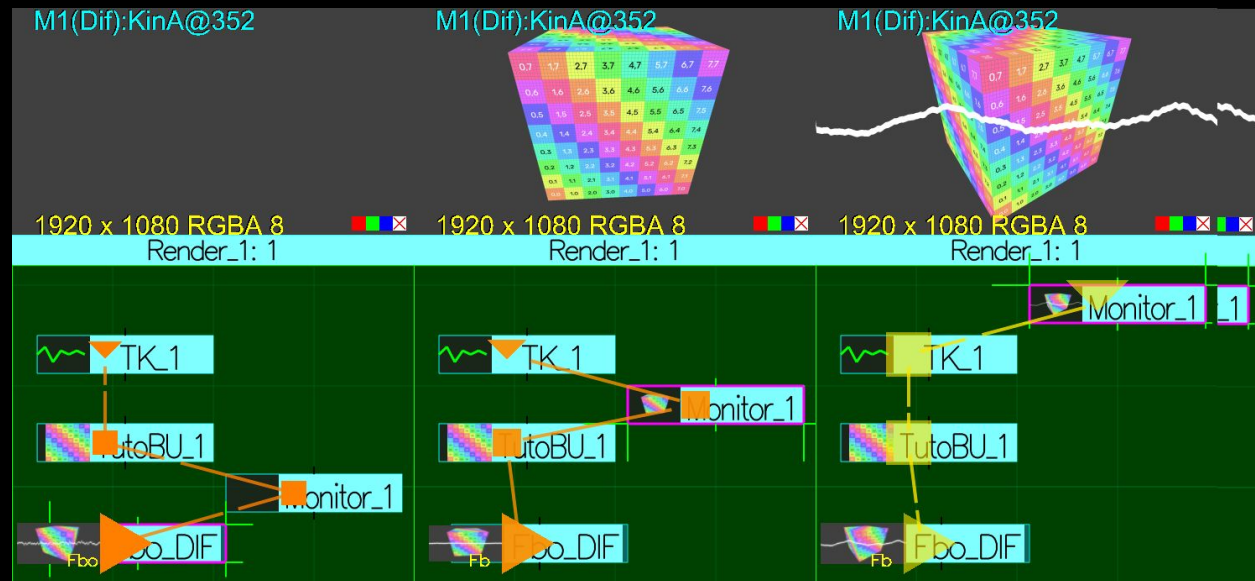
R G B Cy Ye Ma

trail 6.046

MEU Monitor



- **Copy and Display** current state of current Fbo
- **Monitor** show selected attachement



- **Meu**

Show all attachements

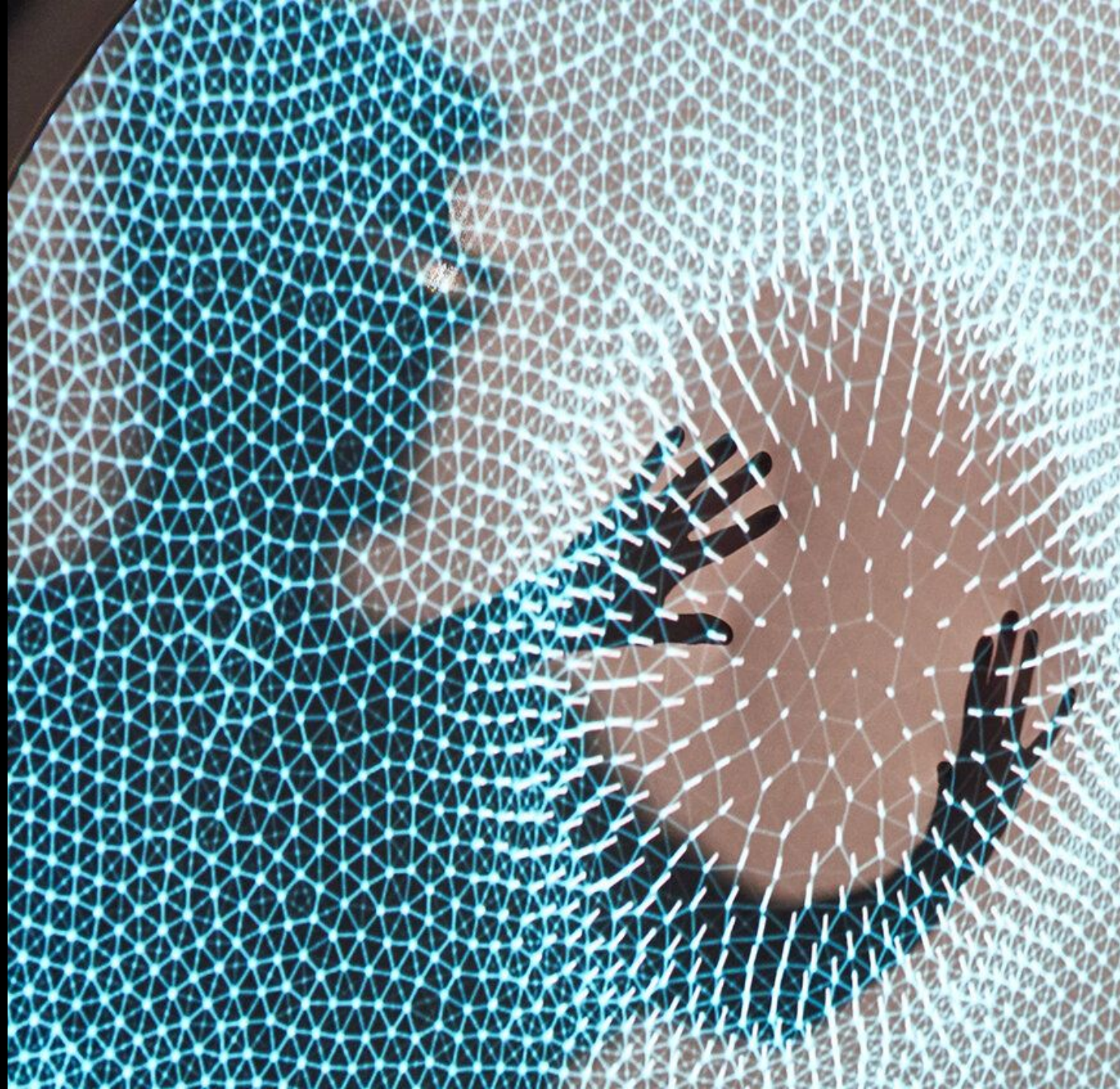
Select monitor attachement

AAASeed

An introduction

Part 15: Create MEU

- Core MEUs
- Fun MEUs
- Create MEU
- Import MEU



Core MEUs

- **Fbo** Frame Buffer Object
 - Canvas where we draw
- **Monitor**
 - Display and copy the current state of the current Fbo
- **Dir**
 - Encapsulate MEUs
- **Video**
 - Decompress video in a texture
- **PIP** Picture In Picture
 - Display a texture
- **Out**
 - Output a Texture
- **TRAX**
 - Plug BU
- Kinect
- Analyse

Fun MEUs

- TK
 - Visualize the Audio
- **Displace**
 - Displacement mapping
- GeoUV
- Obj3d
- Boid
- Deform like class
- Lua Draw
- ShaMosaic

Meu Window: Create MEU

- Navigate MEU
Prototype
- Create New MEU
- Select by Tag
- Select by Name

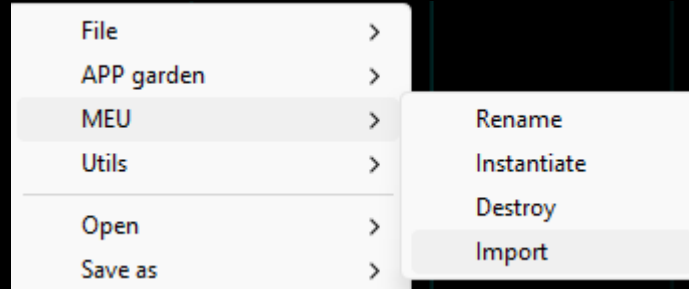
MEU nb 103/121

Tag	MEU Item	MEU Item	MEU Item	MEU Item
2d	2054	AAAUtills	App	BlobDetect
3D	Blur	Boid	Bullet	Cam
Art	CaptureRect	Clear	Clous	CIPool
Camera	ColorCurve	DepthPick	Derviche	DigitalProjection
Core	Dir	Displace	DisplaceCV	DisplacePart
CoreGraphic	DistField	ExShaderGrid	ExShaderInstance	FaceTrak
Deprecated	FaceUV	Fbx	FbxMatte	FieldGene
Device	Flex	FlexVideo	FP	Grab
Draw	GridSel	Hexa	HexCraze	imgAnal
Experimental	ImgSend	Invaders	Kinect	Kinect1
Generator	KinFlipper	KinMove	KinMoveAuto	Lidar
Geometry	LightPassV1	Lights	Marseille	Materials
ImageProcessing	MeshStatic	Mondrian	Monitor	MuBegin
Input	MuEnd	NdcAddBlur	NdcBloom	NdcBranching
Interoperability				
Output				
Point				
Procedural				
Proprietary				
RenderPass				
Sound				
Surface				
Text				
Texture				
Tutorial				
Unfinished				
Utility				
VJ				

Use BU

Meu Window: Import MEU

- Menu File/ Import MEU
- Navigate to an APP
- Navigate to a MEU
folder AAAMEU
- Open



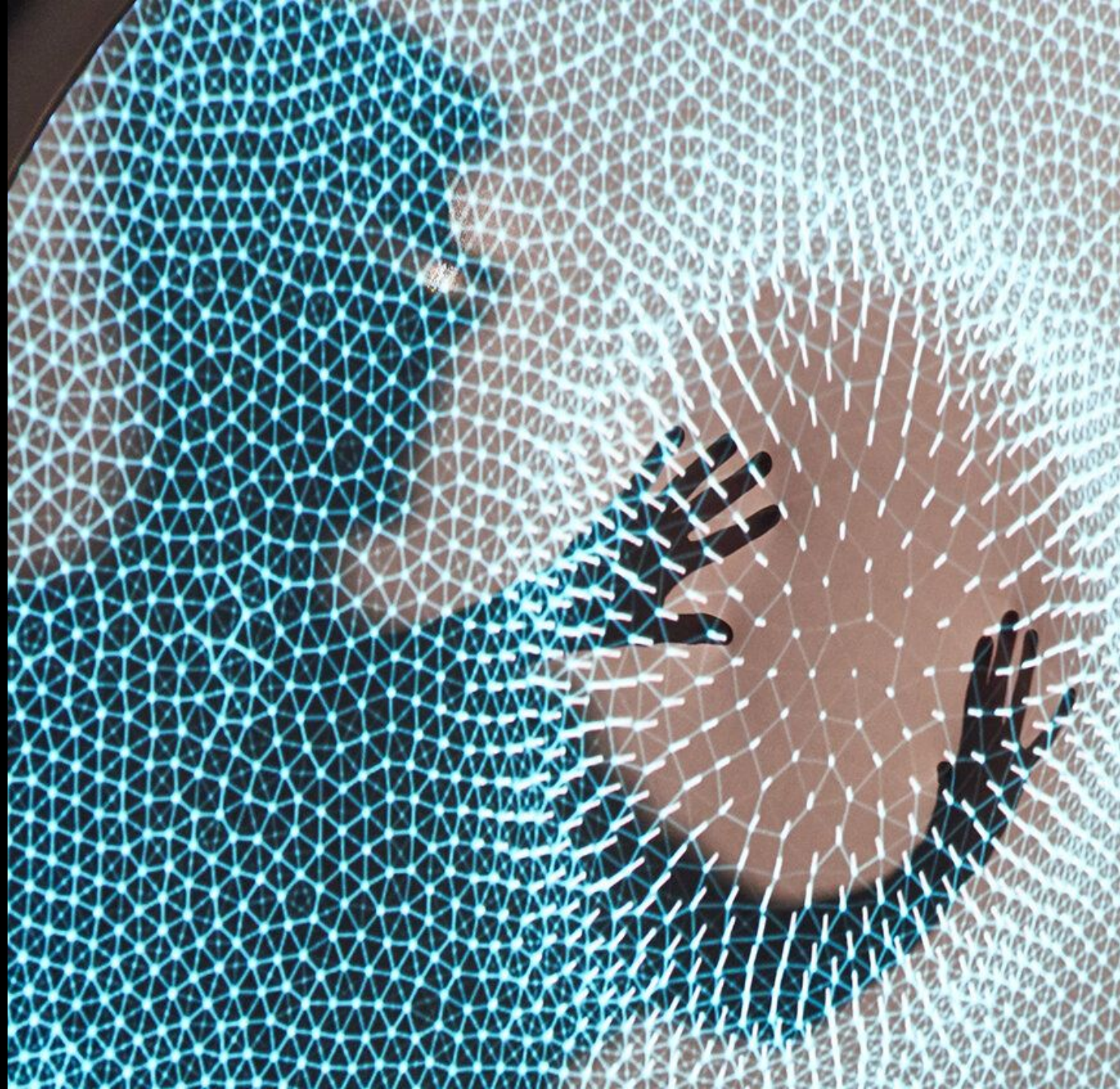
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An introduction

Part 16

Reading video

- MEU Video
- Gain Bias



MEU Video: Send an Image stream to a texture

Ui5 Video_A Fbo <- -> Save X

S UIUD 0.010ms Lua Def Both Load

Pbs — The Shape Of Life Episode1—Origins.DivX—MP3.HankE.avi
In ../../Media/Maa/Movie/life

bank	bind
0	0
4	8
App	16

Oh!

Capture Video

Incrust Inv

0.117 Levels 0.238

Gain 0.35 Bias 0.5

Cpu Gpu

0:00:18:09 In 0:00:00:00
0:53:39:24 Out 9:00:00:00 Clip

— + Step 18.92

Play Loop Restart

Speed 1

0:00:18:09 In 0:00:00:00
0:53:39:24 Out 9:00:00:00 Clip

— + Step 18.92

Monitor Center Flip U Flip V

volume 1

Preset 2 4 6 8



- Video Name and folder (Red when a problem)

- Bank / Bind like texture

2 selectors

Click double

Pick a video for the bind

bank	bind
0	0
4	8
App	16

- Play / Control

In / Out / Clip → play a subpart

- / + → move in time of Step

- Monitor

Click double open as separate

- Volume

Check button with Slider

There is a master Volume Too

- Capture → switch to capture mode

more in a separate document

- Video → Flatland (Violet)

- Incrustation

Luminance Incrustation

Inverse → inverse the curve

Levels → min max levels of incrustaion

Gain / Bias alter the shape of the transfer curve (more next slide)

- Cpu / Gpu

– Decompression happens in the CPU Side

– Where we keep it

Play Loop Restart

Speed 1

0:00:18:09 In 0:00:00:00
0:53:39:24 Out 9:00:00:00 Clip

— + Step 18.92

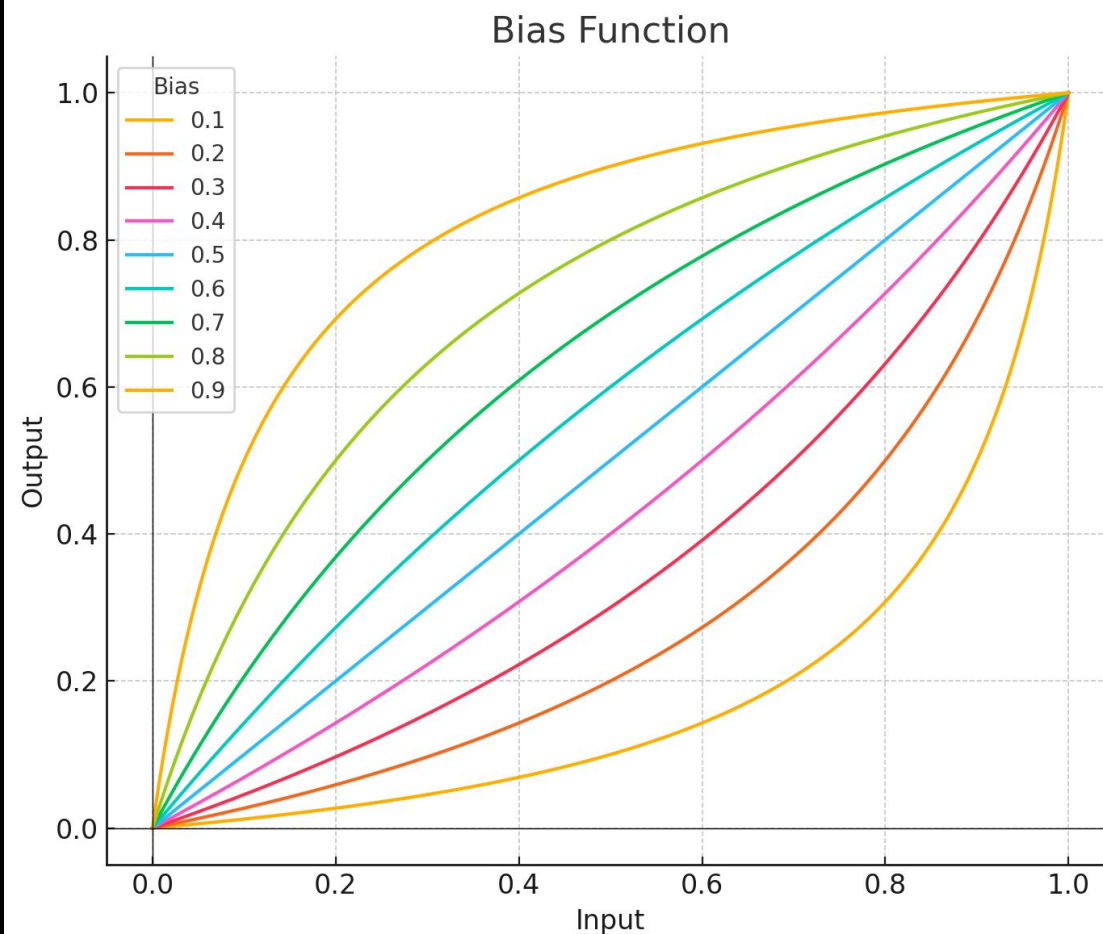
Incrust Inv

0.117 Levels 0.238

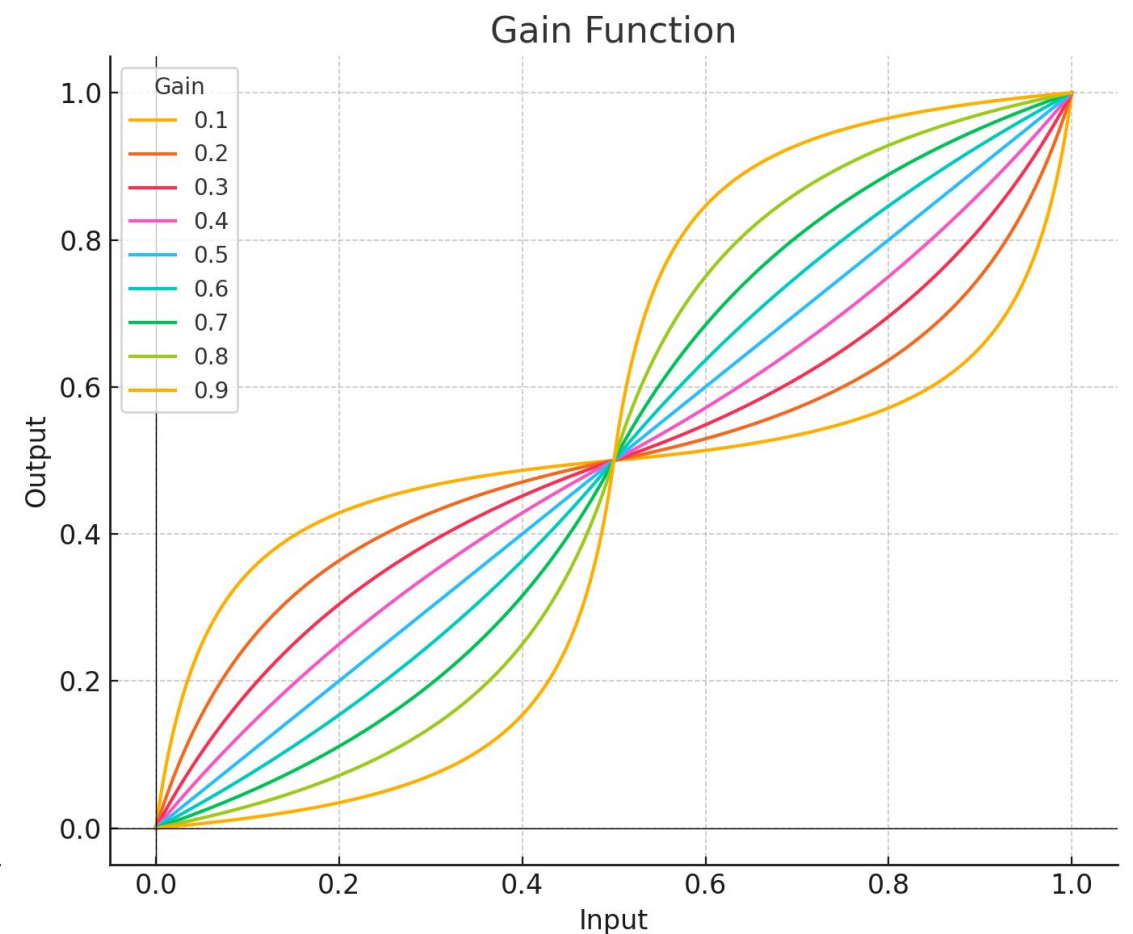
Gain 0.35 Bias 0.5

Cpu Gpu

Gain Bias an electronic heritage



- **Input at 0.5 : Bias value**
- **Low Bias → Push values down**
- **High Bias → Push values up**



- **Double Bias curve (symetry in the middle)**
- **Low Gain → Push value to middle**
- **High Bias → Push values to extreme**

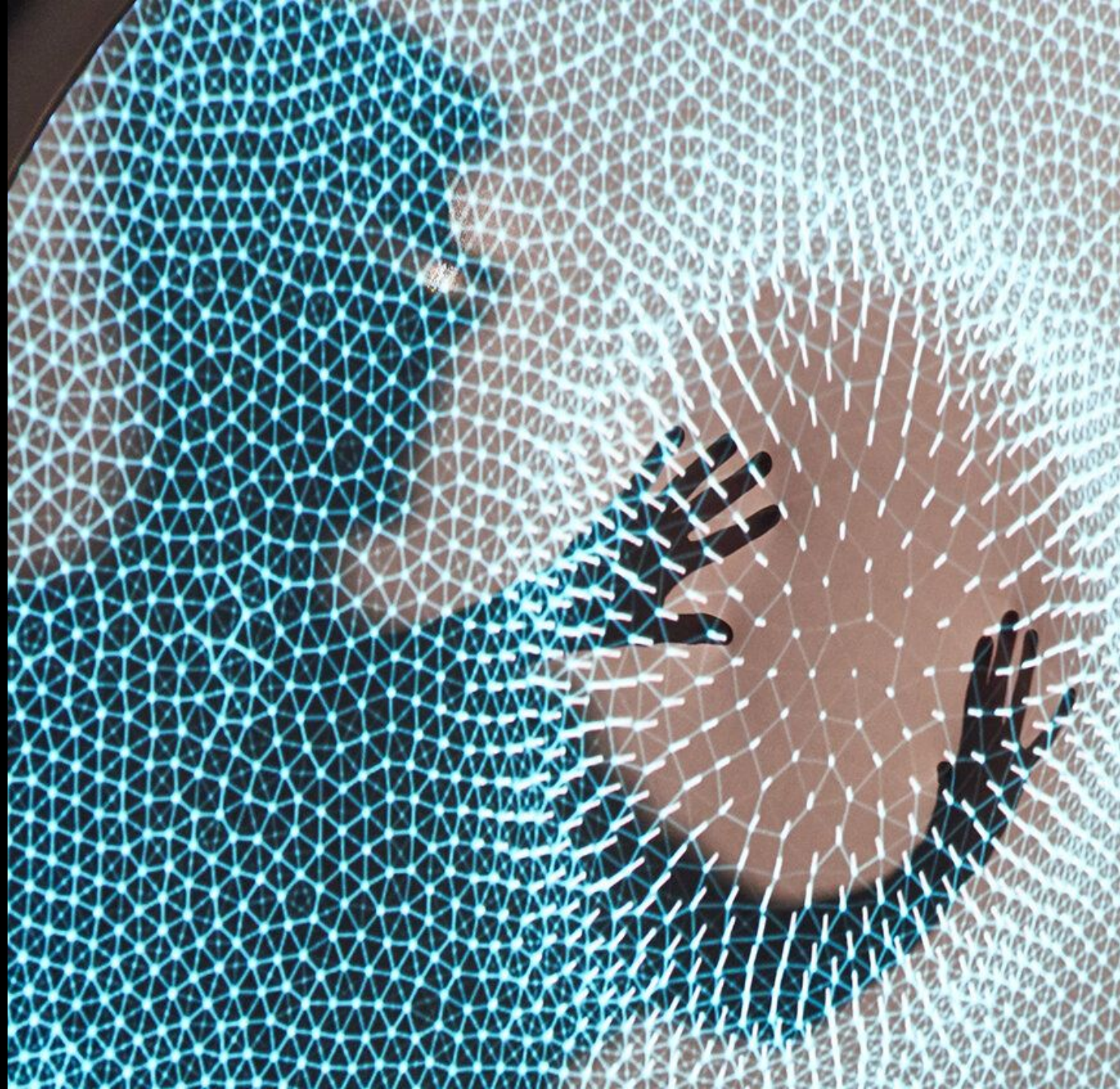
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Part 17

Display texture

- MEU PIP
- Ratio and Size
- Translate Rotate Scale
- Blending



MEU PIP (Picture In Picture): Main

The image is a screenshot of a game engine's user interface, likely for a 2D or 3D game. The interface is divided into several sections. At the top left, there's a status bar showing 'Ui5', 'PIP_1', and 'S UIUD 0.062ms'. To the right of this is a 'Main' tab, followed by a 'Map' tab. Further right, there's a 'Fbo' section with a dropdown menu showing '<->' and a 'Save' button. Below the 'Map' tab, there's a 'Lua Def Both Load' section. The central part of the interface features a large 4x4 grid of color swatches, each with a numerical value. The grid is organized into four rows and four columns. The first row contains values from 0.7 to 7.7. The second row contains values from 0.6 to 7.6. The third row contains values from 0.5 to 7.5. The fourth row contains values from 0.4 to 7.4. The fifth row contains values from 0.3 to 7.3. The sixth row contains values from 0.2 to 7.2. The seventh row contains values from 0.1 to 7.1. The eighth row contains values from 0.0 to 7.0. To the right of the grid, there's a 'cam.index' section with a dropdown menu showing '1' and a 'Sync go' button. Below this, there's a 'Ratio' section with a dropdown menu showing '1' and a 'Swap' button. Further down, there's a 'sfactor' section with a dropdown menu showing '1' and a 'su 1' button. At the bottom right, there's a 'Fuzzy 0.01' section. The interface is dark-themed with various colored buttons and text. The overall layout is complex and functional, typical of a game engine's development environment.

- ## Tex : Next Texture

- | Incrustation | Flip |
|--------------|------|
| 0 | Luma |
| 1 | 1 |

- **Mask**

Remap	Flip
0	Luma
1	Chroma

- **Flip : Inverse the remap**

- **Cameras**

- **Size and Moving setting**

- **Colors for object, background, offset and Gamma**

- **Clamp :**

- **Fuzzy edge / border**

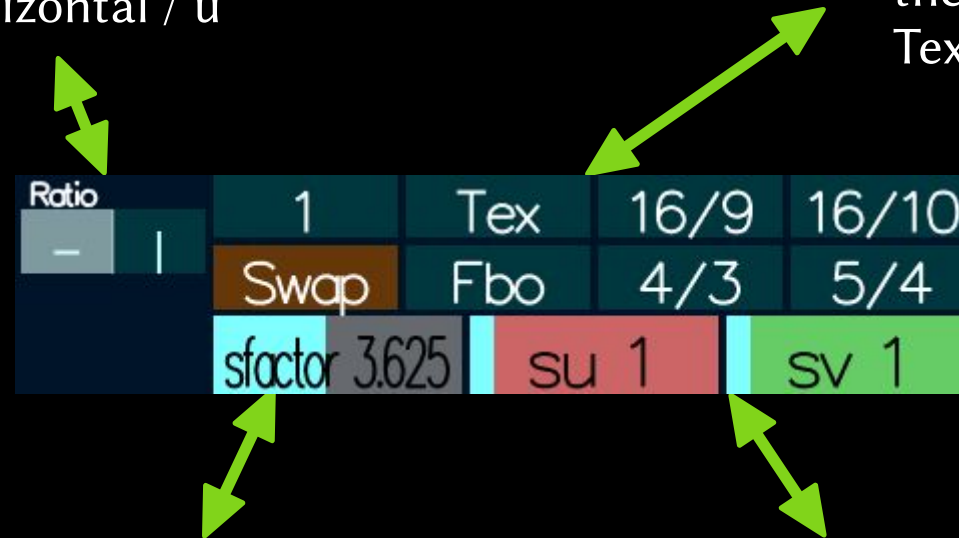
- **Selector : blending**

Ratio and size

- This changes the sizes used by a MEU to render

Select direction
the ratio buttons will affect:
here horizontal / u

Ratio buttons
change the slider
su or sv
to match
the ratio asked.
Tex → Texture



Size Factor:
size in both direction

Size u and v:
size in uv direction

TRS ↔ Translate Rotate Scale

- This controls what is named in 3D: a **transformation**
- **Not moving the camera**
- **Changing the coordinates** of where an **object** is drawn

- Developer note

Alter the model (model to world) matrix

- **Combine 3 Types of transformations**

- **Tra** → **Translate**

- **Rot** → **Rotate**

Rotation unit in AASeed are turns

0.25 → a quarter turn

0.5 → a half turn

1 → a full turn

- **Sca** → **Scale**

- **Experiment and understand in which order Tra Rot Sca are performed**

- Better **keep button TRS Off** if transformation is **not used**

General button
allow global TRS use

Individual buttons
allow each transformation

TRS	Tra	Trax 0		Tray 0		Traz 0
	Rot	Rotx 0		Roty 0		Rotz 0
	Sca	Scax 1	Scay 1	Scaz 1		

MEU PIP : Map



- nb_u, nb_v : number
- U Min Max, V Min Max : stretch the texture
- hexa :
- top_line :
- du, dv :
- offsets :

Blending

mapping_blend_menu					×
Min	Max	Add	Sub	RSub	
Mul	Screen	Overlay	Darken	Lighten	
ColDodge	ColBurn	HardLight	SoftLight	Diff	
Exclusion	HSL_Hue	HSL_Sat	HSL_Col	HSL_Lum	
		Add			

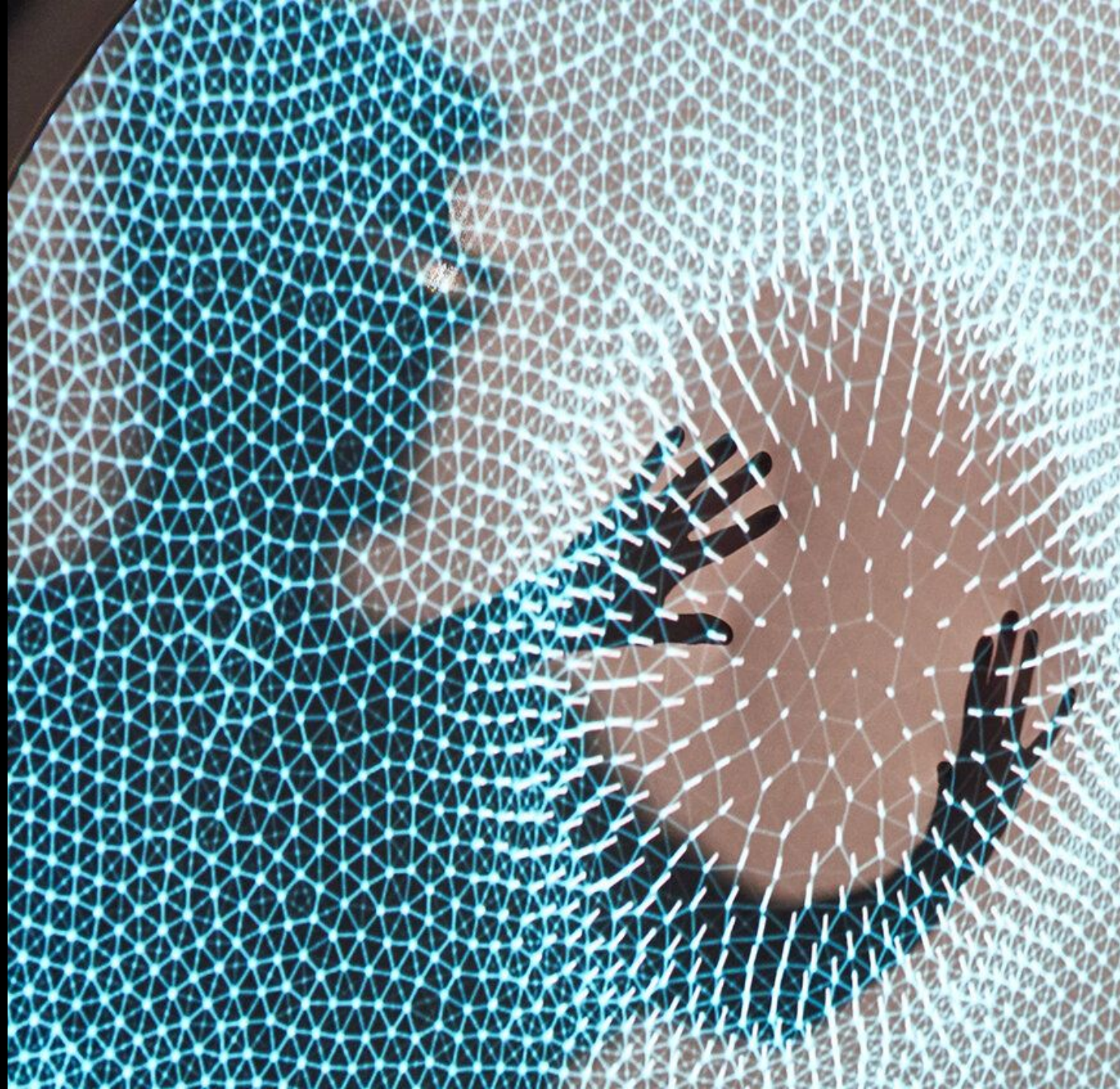
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An introduction

Part 18:

Outputting image

- MEU Out
- rendering



MEU Out: Display an Image in Output

Ui5 Out_2 Main Map Fbo <- -> Save X
S UIUD 0.622ms More Master Lua Def Both Load

cam_index
No 1 2 3 4 5 6 7
Once screen_dst
Owner

Use Fbo Add Focus
Crop Force White
Full 1 2 3 4 5 6

color
Deform TopGrid
UI draw Grid Reset
Color Gamma
By pixel
Ratio 1 Tex 16/9 16/10
Swap Screen 4/3 5/4
sfactor 1 su 8 sv 4.5

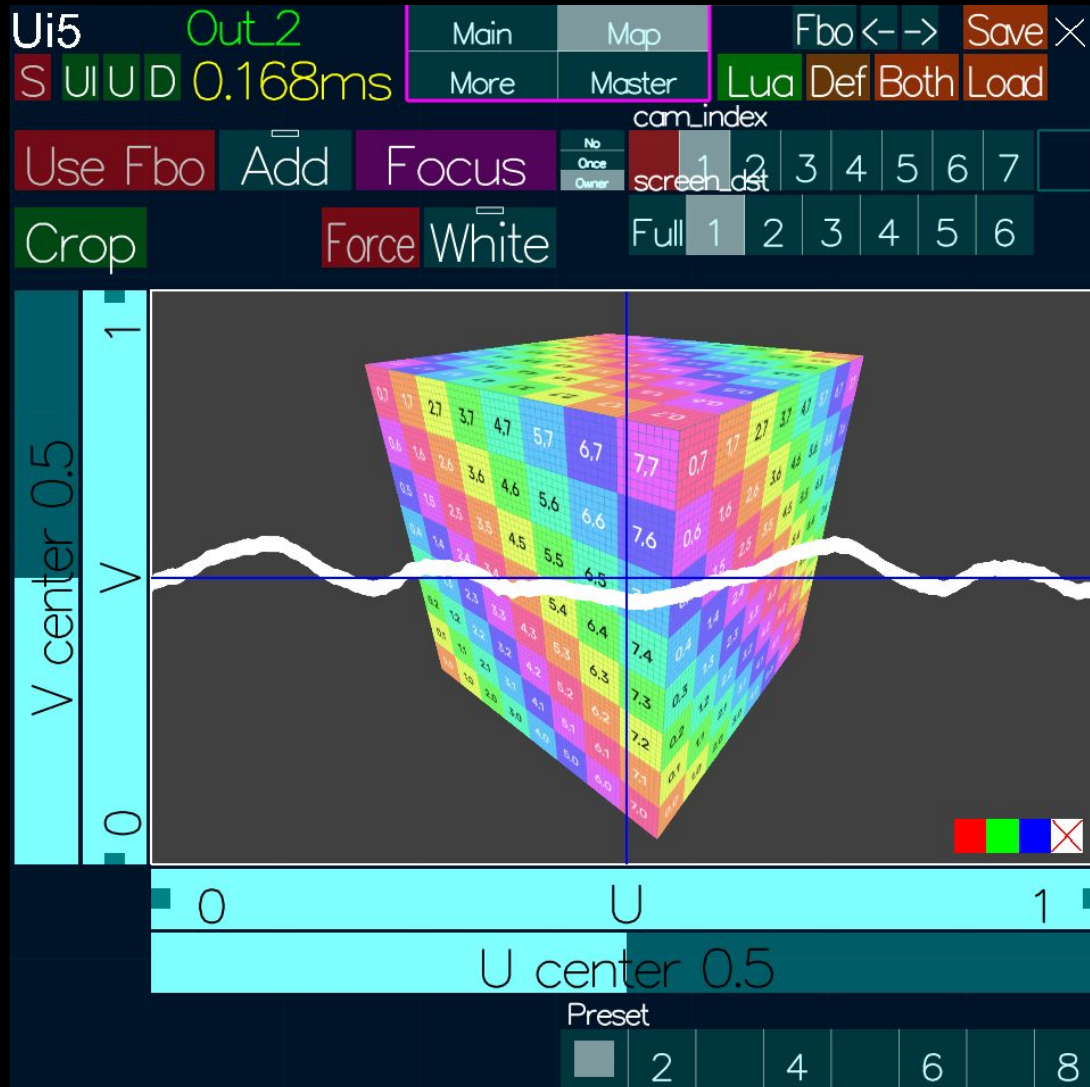
Gamma 1 SetGet SetGet Gamma 1
0 LR 1
0 BT 1
Gamma 1 SetGet SetGet Gamma 0
1 2 3 4 1 2 3 4

Tex Vid 18

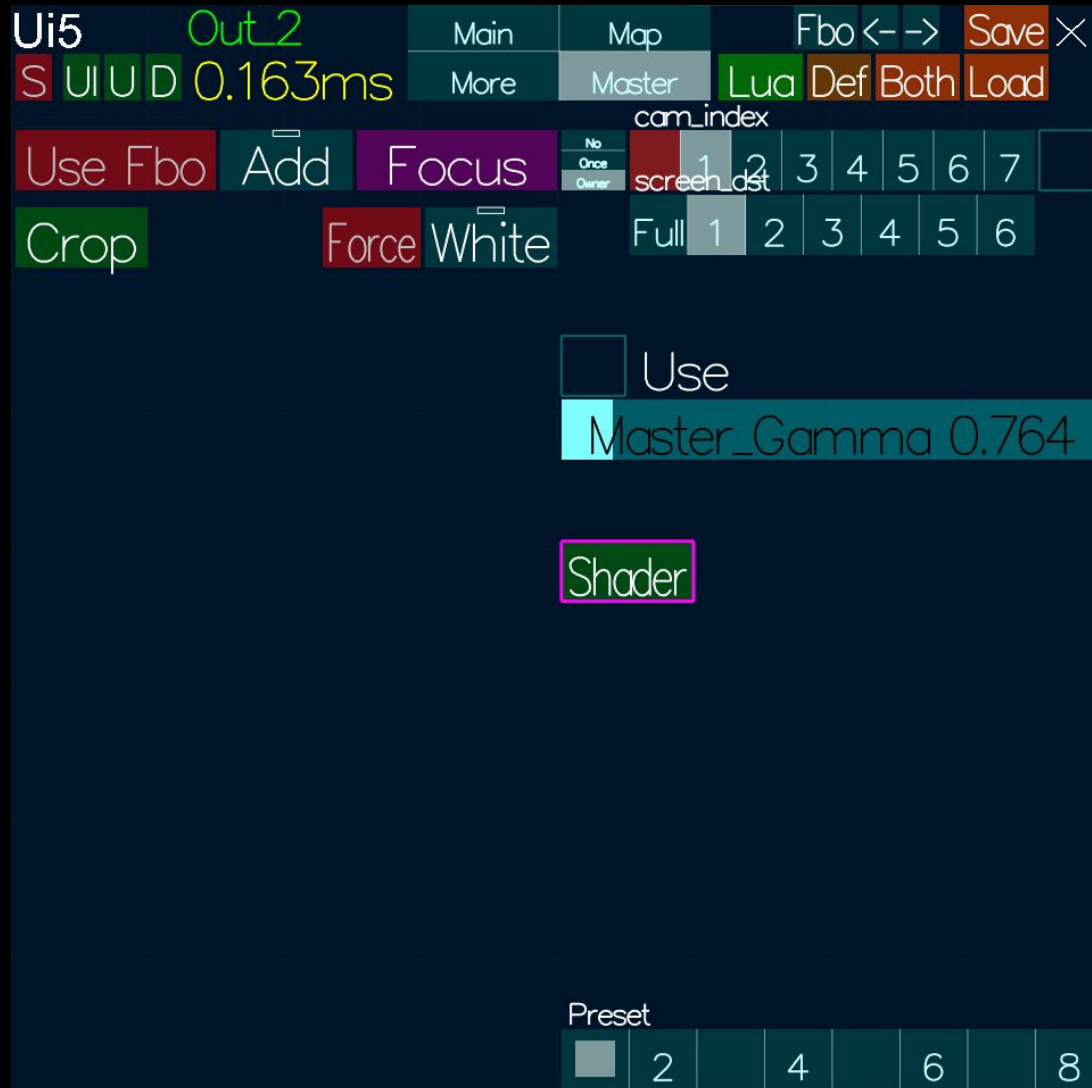
Light Back FillLinePoint Line 1 Nor
Depth Front FillLinePoint Point 1 8
Preset 2 4 6 8



MEU Out: Display an Image in Output



MEU Out: Display an Image in Ouput



Rendering

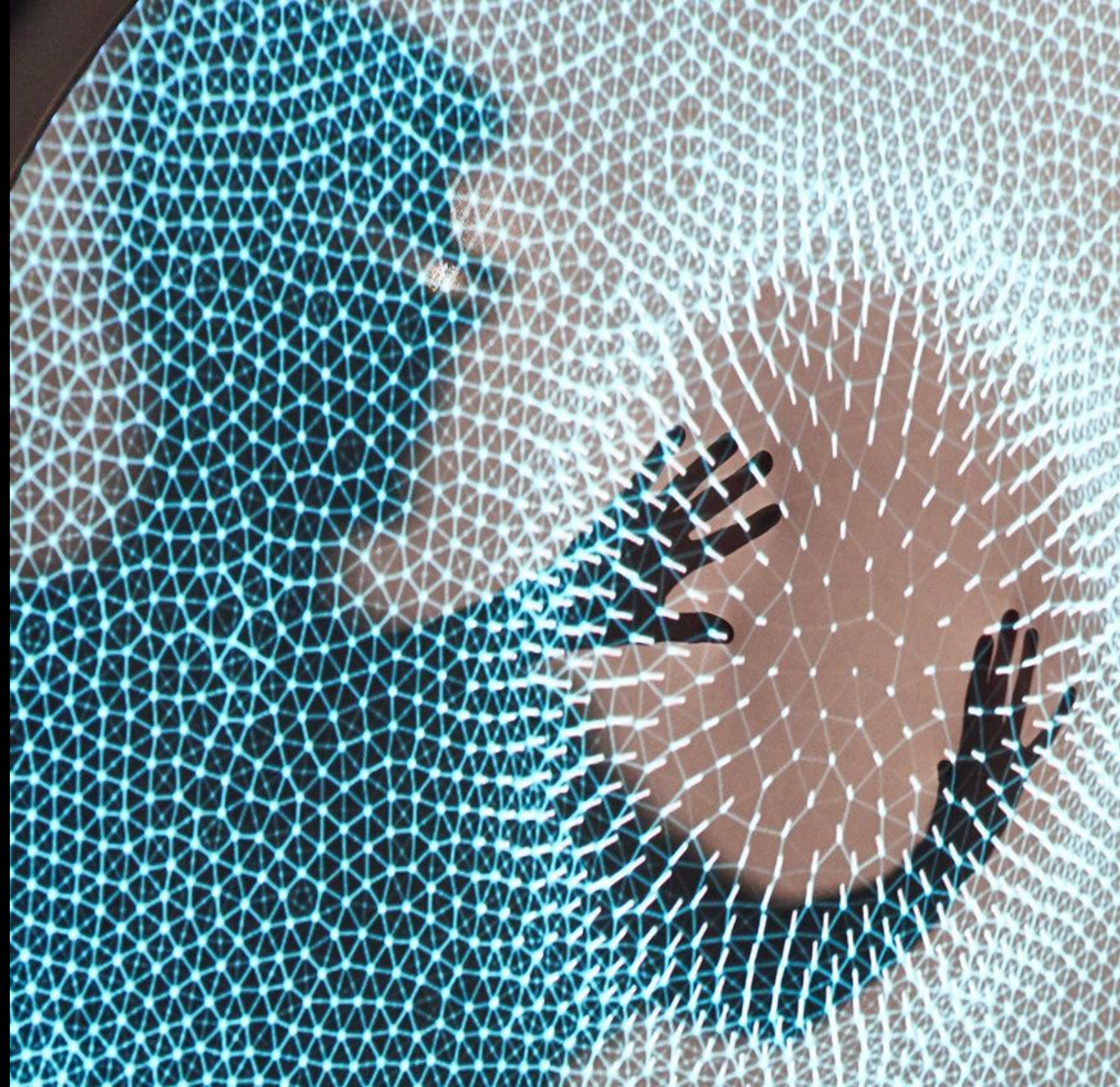
Light	Back	Fill	Line	Point	Line 1	Nor
Depth	Front	Fill	Line	Point	Point 1	1

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Part 19: Plugging

- MEU Trax



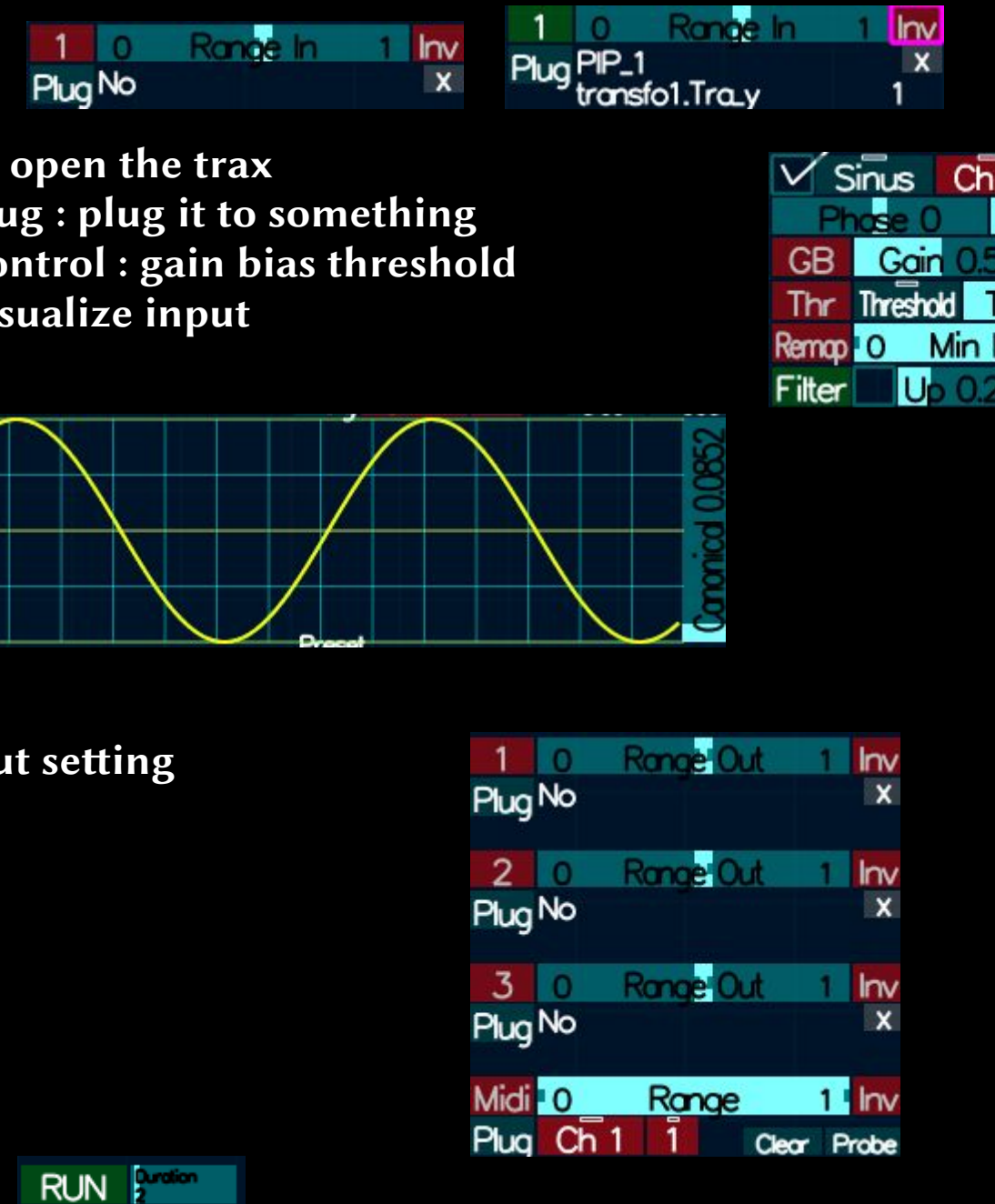
MEU TRAX



- 1 : open the trax
- Plug : plug it to something
- Control : gain bias threshold
- Visualize input



- Out setting



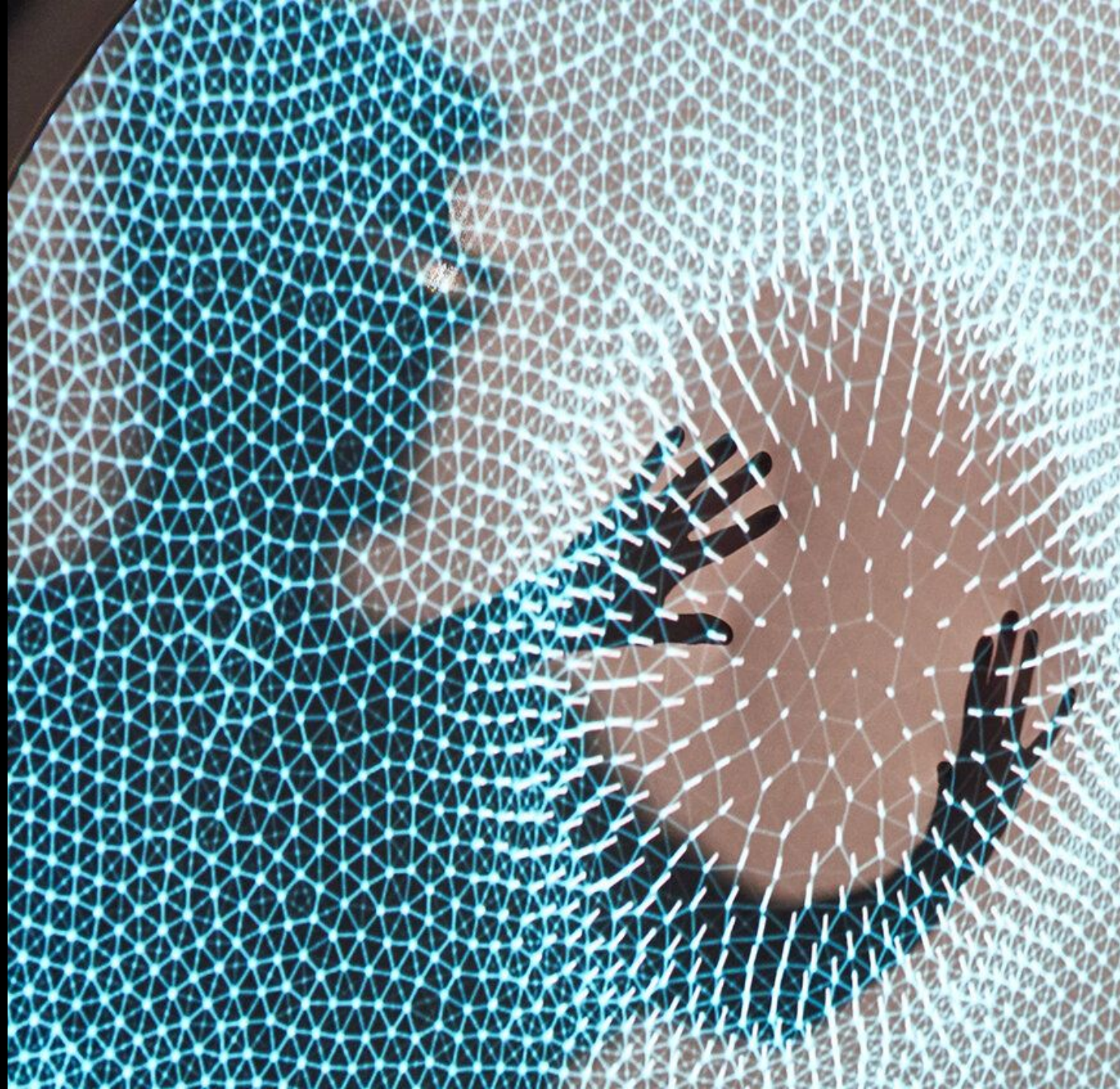
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Part 20:

Fun with sound

- MEUTK



MEU TK

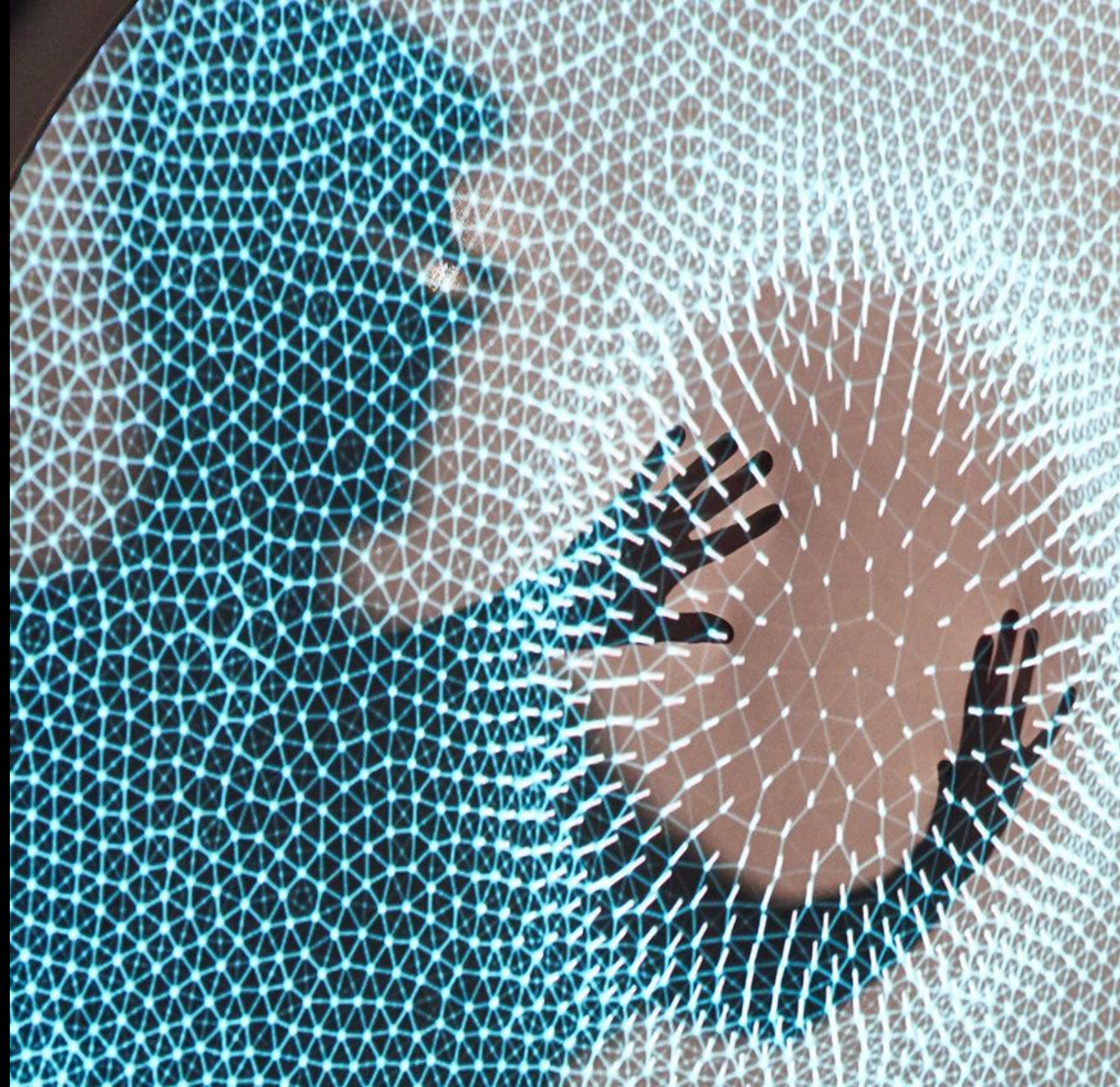
Ui5	TK_1	Fbo <- ->		Save	X
S	UIUD	0.140ms	Lua Def Both Load		
Shader		FFT	cam_index		
			1	2	3
Size 8	Sample Nb 512	Gain 7.517	offset 0		
	Nb U 2	ABS	Clamp	Th 0	
Softness 0.1	Range 0.9	Filter	Filter Value 0.9		
no Tex Vid 11	0 U Min Max 1	No	Average	Max	Decay
Tex:L@107	0 V Min Max 1	Interval 16	Strobe 0		
	Add	Sym	Thickness 0.126	Force 0	
color		0	Radius 1	Turn 1	
		inter 0	Angle 0		
Edge Ep 1	Nb V 2	Side	Amount 1	Side NB 3	
Edge		Spiral	Factor 0		
		X 0	Y 0		
Particle Color		RotX 0	RotY 0	RotZ 0	
Light Back	Fill LinePoint	Freset			
Depth Front	Fill LinePoint	4	8		
		12	16		

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Part 21: Looping MU

- MU Begin / End



MEU MuBegin / End

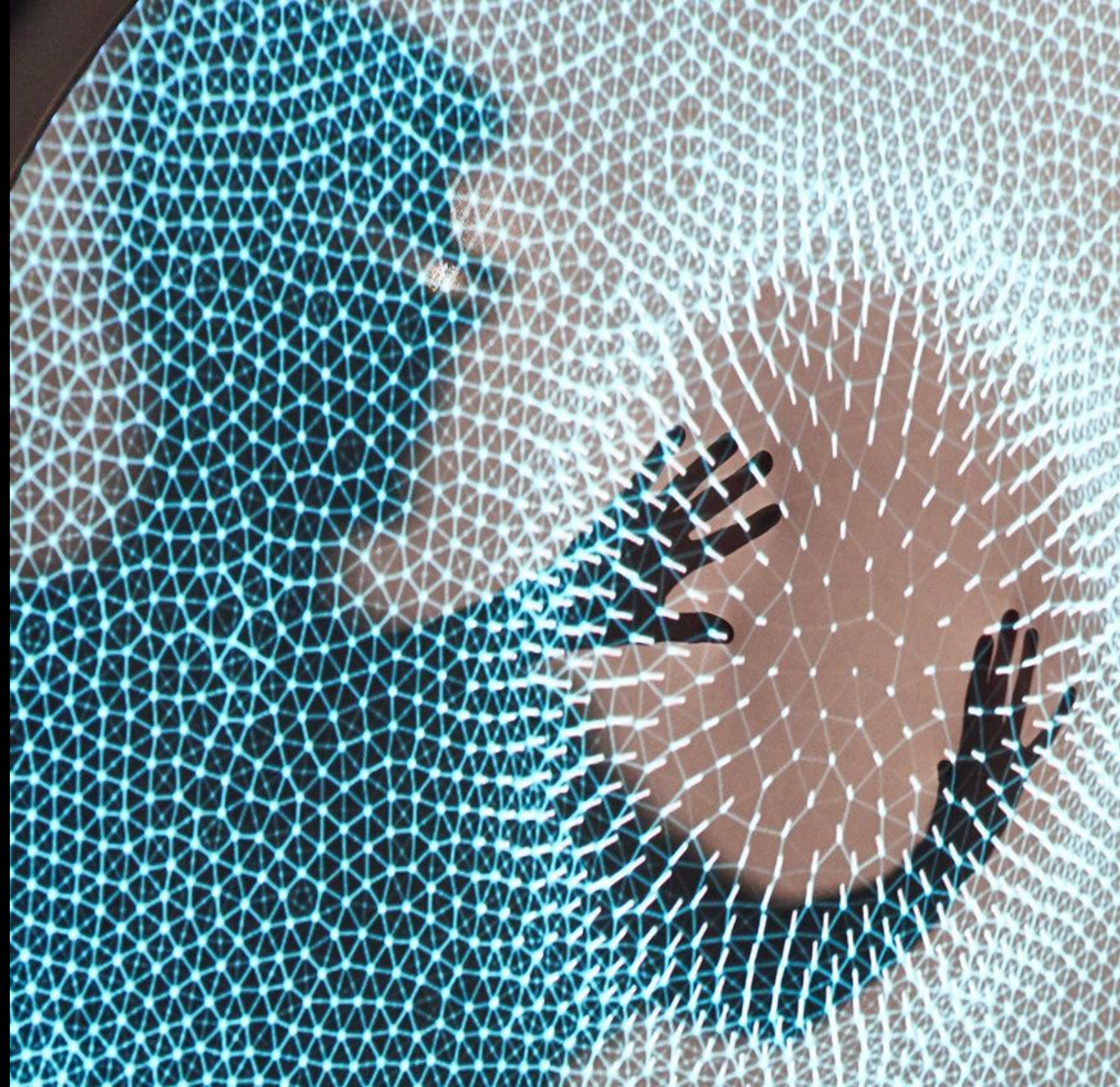
- Use for multipass at first
- Make loops
- Camera

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Part 22: Reading Kinect

- MEU Kinect



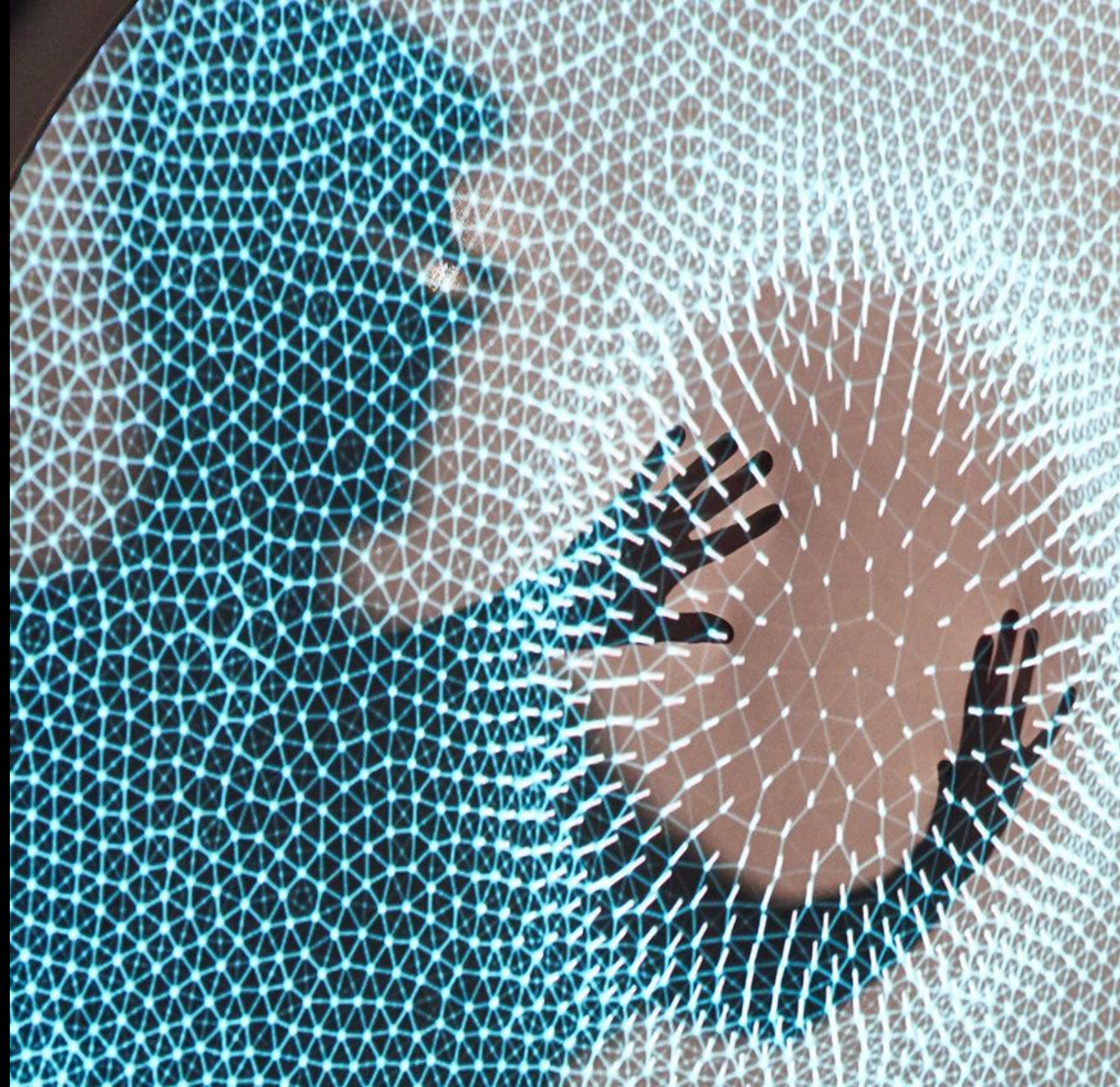
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Part 23:

Processing Kinect

- MEU KinMoveAuto



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Part 24: more MEU

- Displace
- Cam
- Clear
- GeoUV
- Invaders
- Mire
- MovieWriter
- NdcJumpFlood
- Obj3D
- Typo
- Ref
- OpenCvBase
- ShaMosaic
- Spout
- TexCpy
- TriMix
- Tuto
- Flex
-

