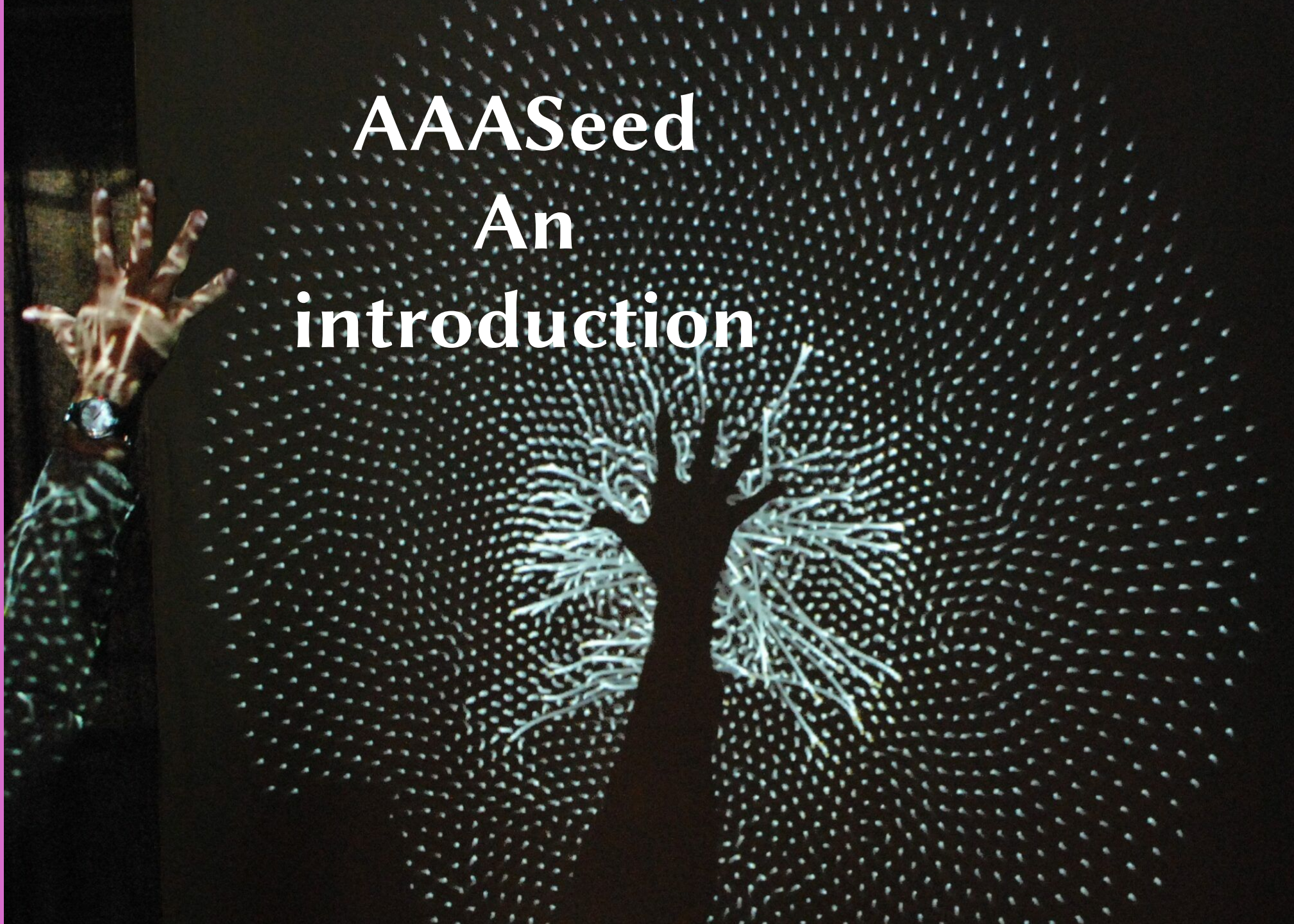


AAASeed

An introduction

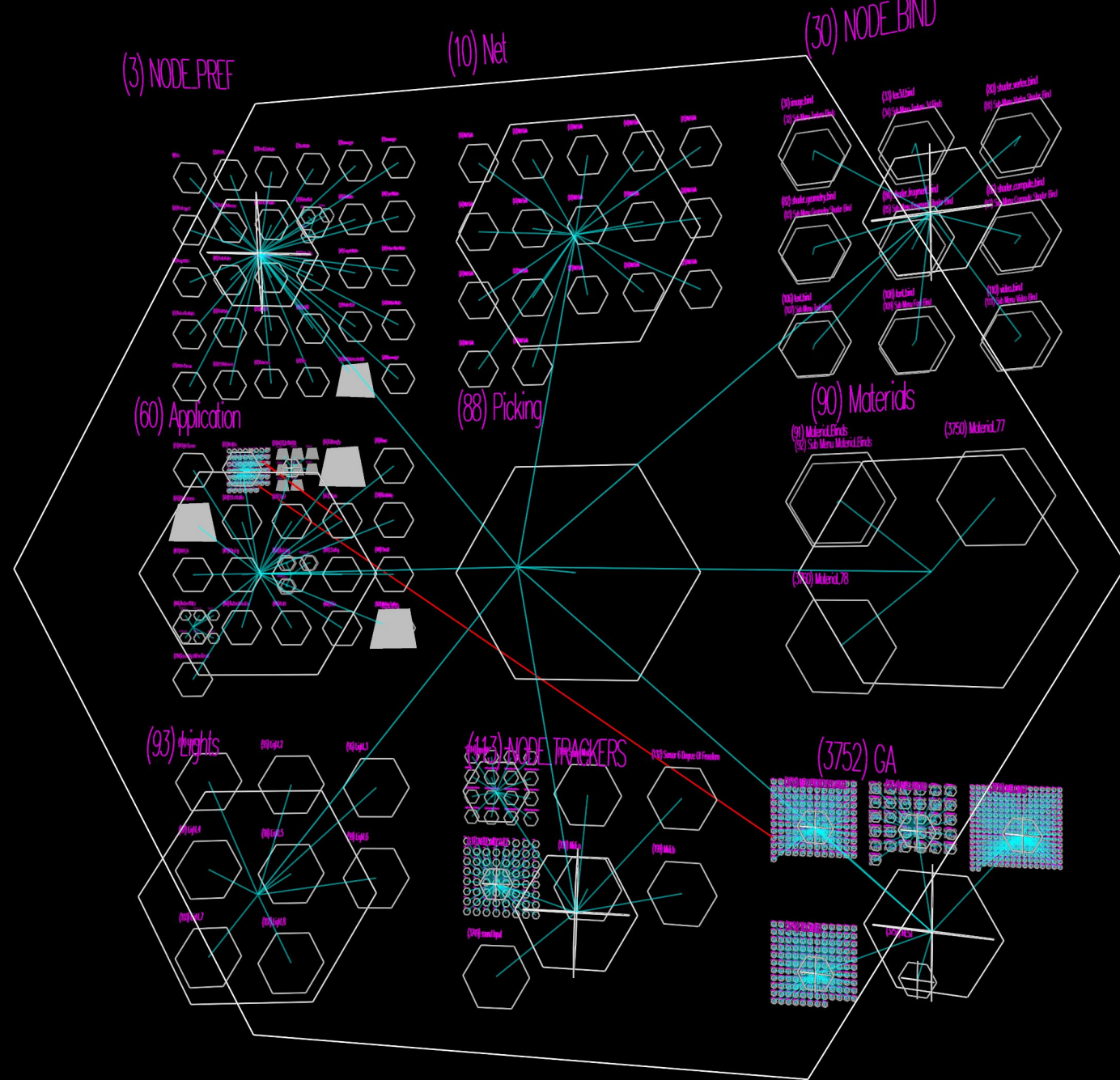


AAASeed

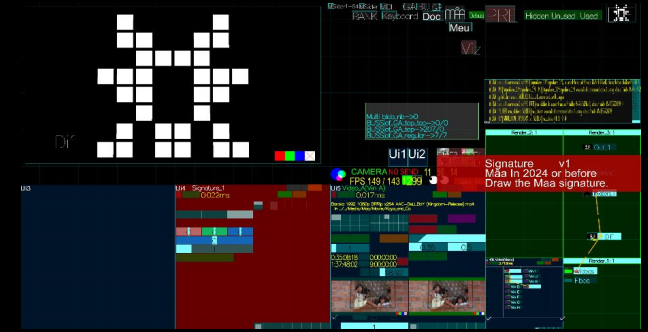
An introduction

Part 1: In the beginning

- What is AAASeed
- Ga Bu Zo Meu
- Setup AAASeed on your computer
- Folder structure
- AAASeed Sources



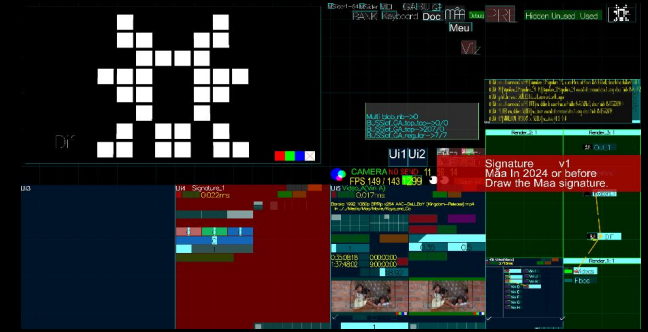
What is AAASeed ?



- A **generic toolkit** to build **realtime** processes
- oriented mainly in 3 contexts
 - Video Jockey and Live Mapping
 - **Open data**
 - **Interactive Art** installation
- Soon **OpenSource** (MIT license) and **free**
- Brainchild of **Mâa** with the help of **Franz Hildgen**
Used and refined in real **production** for **25 years**
- Cleaned and stabilized with the European Project ending September 2025
<https://ArtCast4d.eu>
Early Adopters Program
- **AAASeed** intend to live Longer
<https://AAASeed.org>

For whom is AAASeed ?

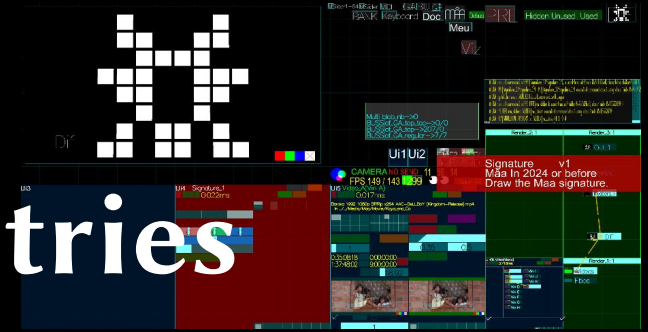
Artist



- A place to **assemble** and **compose** blocks on the fly
- most of these blocks deal with **graphics processes**
- some of the blocks
 - deal with **inputs** (cameras, captors)
 - analyse **images**
 - **connect elements**
- produce **live graphic** and **interactive processes**
- **Free License**
free digital support for generative and interactive artworks

For whom is AAASeed ?

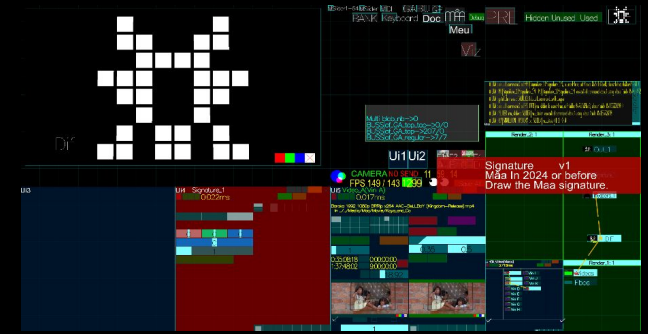
Creative and Cultural Industries



- **Video professional**
everything to display and control videos, images and texts.
- **Immersive environment**
deal with multiple screens and multiple machines.
- **Working live in conjunction with the existing tools**
 - Protocols: Spout, OSC, Midi
 - TouchDesigner, vvvv, unity, Unreal, Chataigne, OBS studio....
 - Max msp, Live, PureData....
- **Plenty of possible usage**
 - Dance, Theater
 - TV, Digital signage, Interactive screens
 - You name it
- **Free License**
Free budget for the production itself

For whom is AAASeed ?

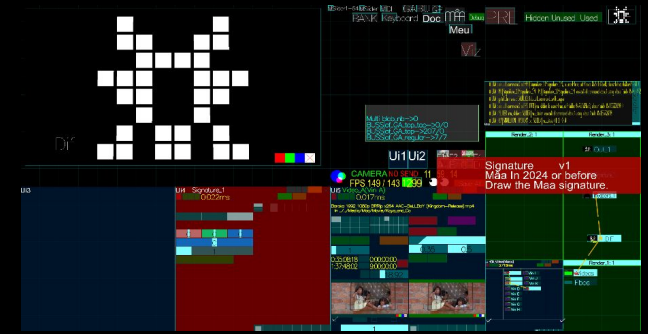
Developer



- 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 ?

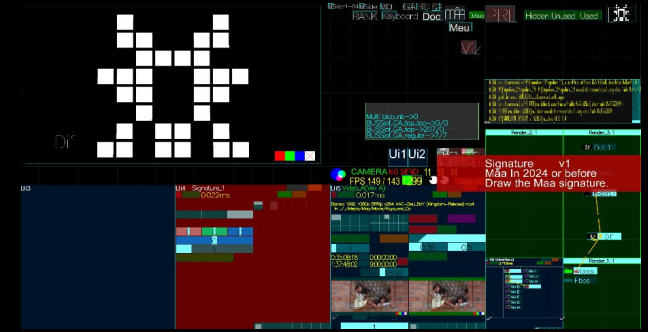
Student, Hobbyist, Teacher



- 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

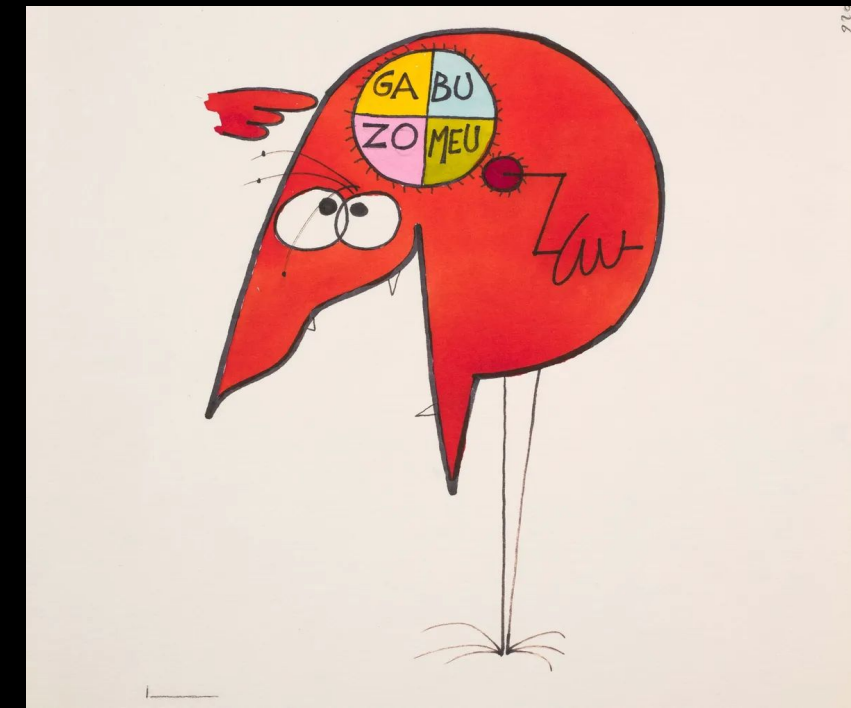
- This a **Windows** application for now
AAASeed_Metal.exe
- Tested against **windows 10 and 11**
but should also work on Windows 8,7 even XP.
- It can **run on low end machines**
even an executable for non Avx2 Processor (AAASeed_Wood.exe)
- But it likes fast machines and **uses the Gpu a lot**
Graphic 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 ZO»)
- More on this: search Shadoks on YouTube
 - <https://www.youtube.com/watch?v=SlA57Zw-FN4>
- Thanks to **aaa**production (<https://www.aaaproductio.fr/>)



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/>

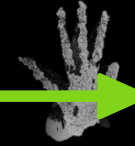
- **Blender**

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

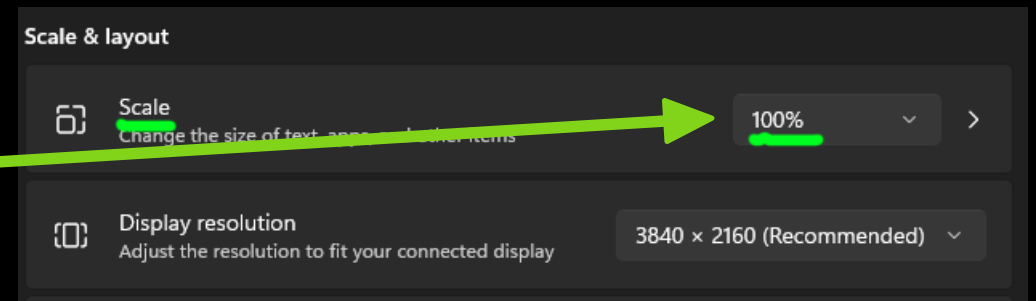
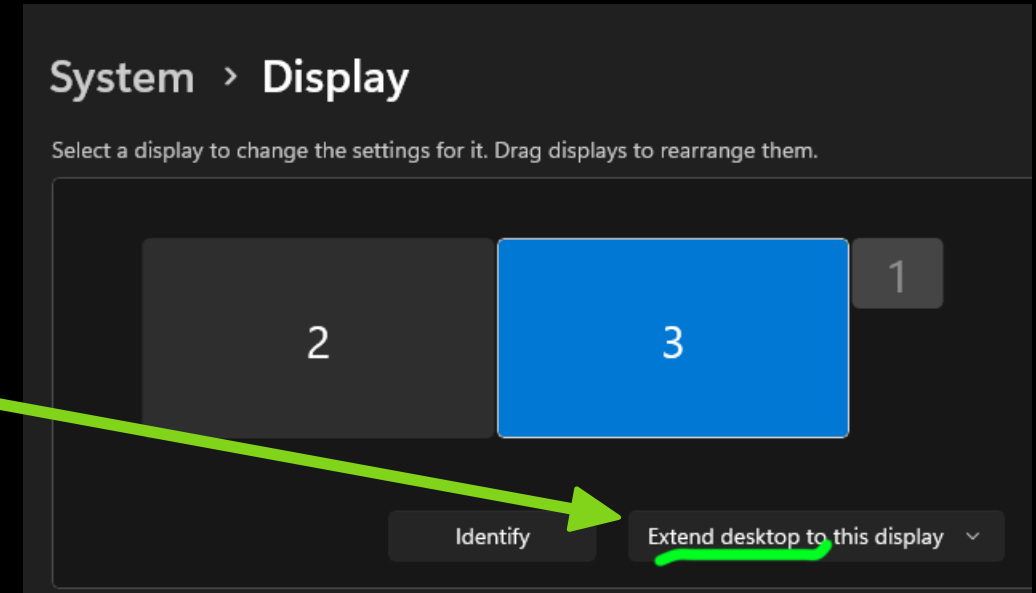
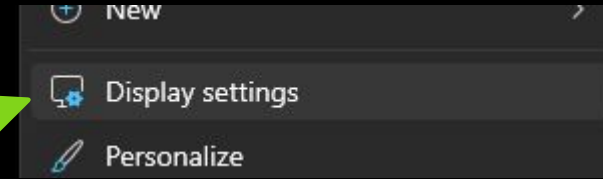
Dialog

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

Was mandatory before 2025 May

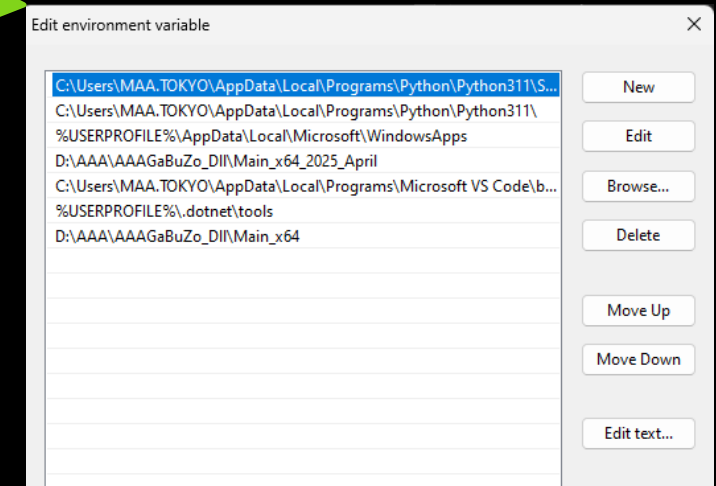
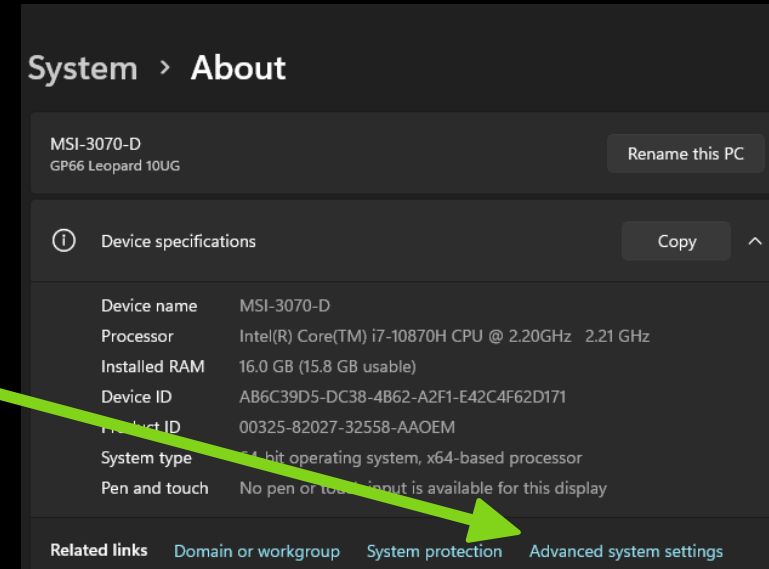
Scale all screens to 100%

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

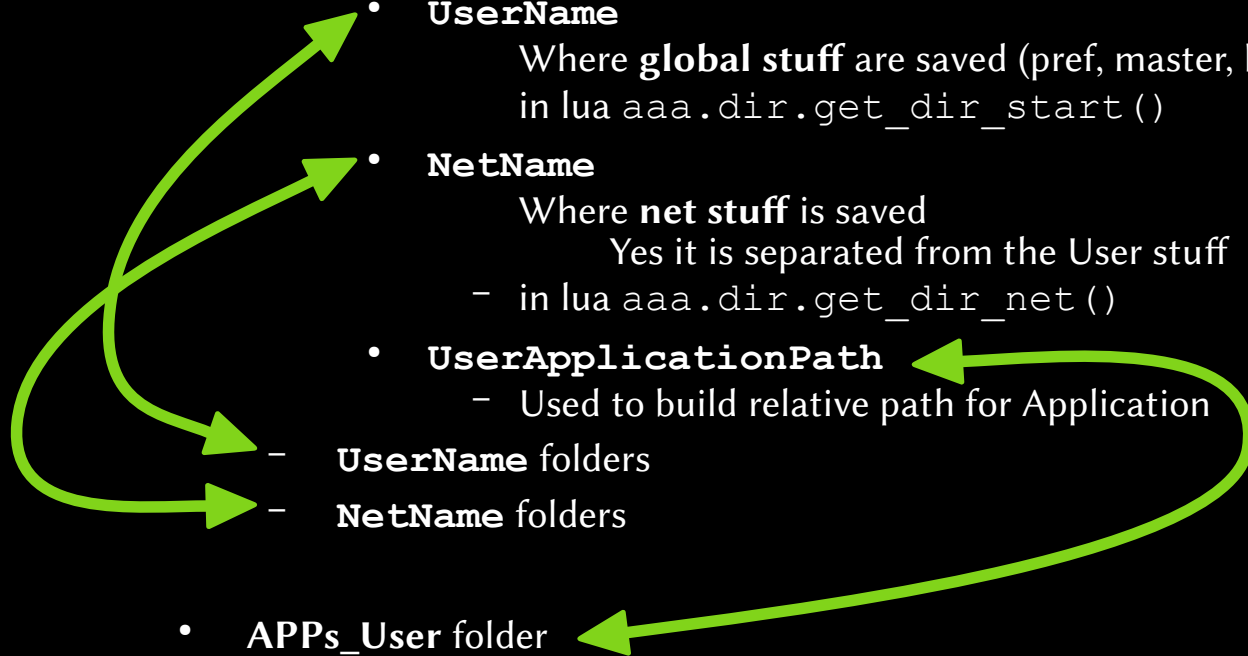
An App ↔ A **folder** with a file `default.layerss_param` inside
Examples, Tutorials...

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
 - **AAAWho.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

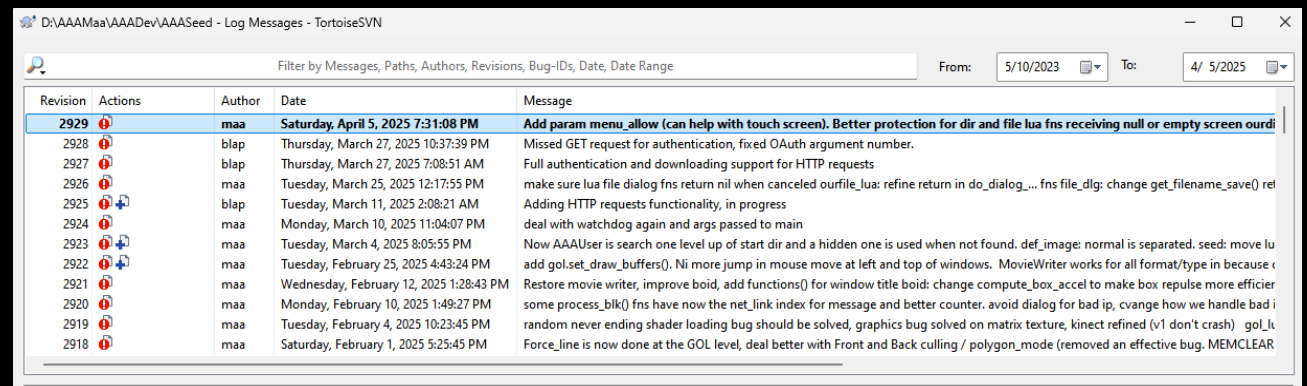
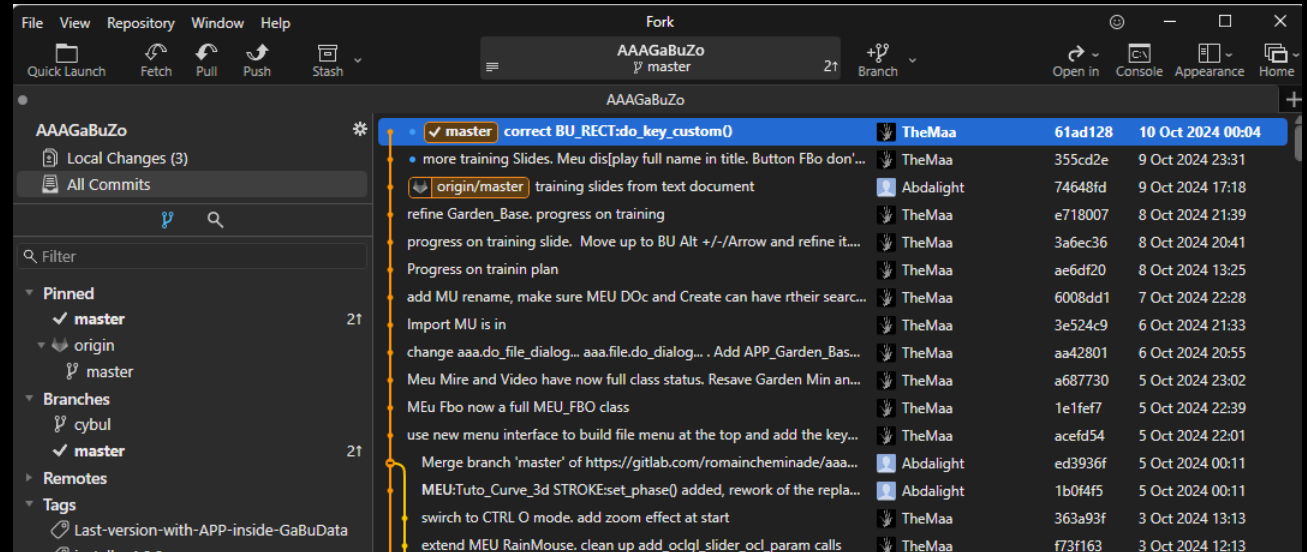
Svn

-AAASeed.exe and dll

-C++

-will move to a git

request Maa if you want it



AAASeed

An introduction

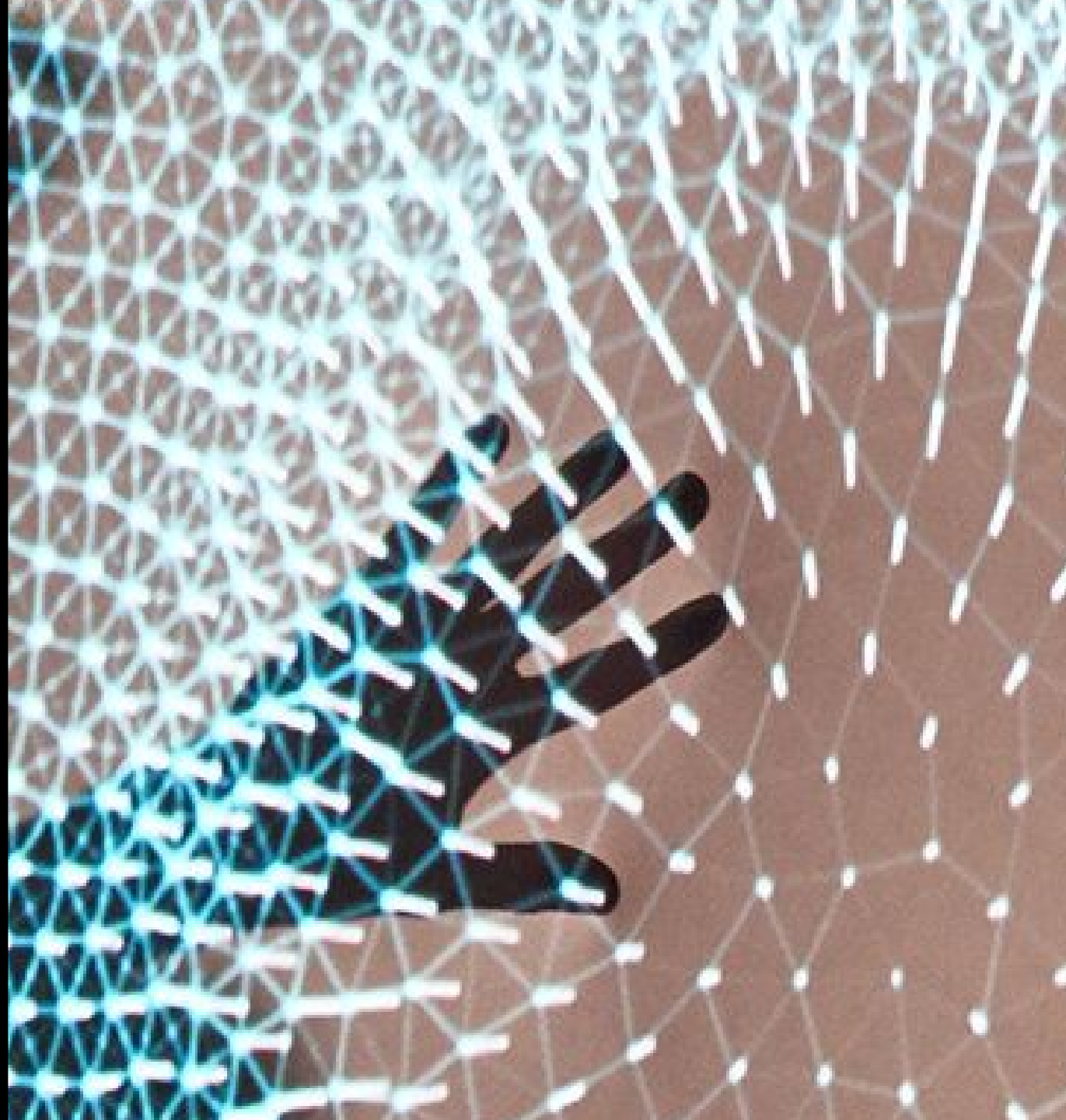
Part 2:

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 AAAFoundation/AAADll

First steps

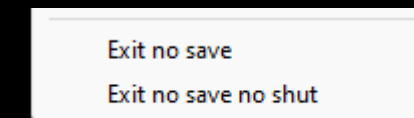
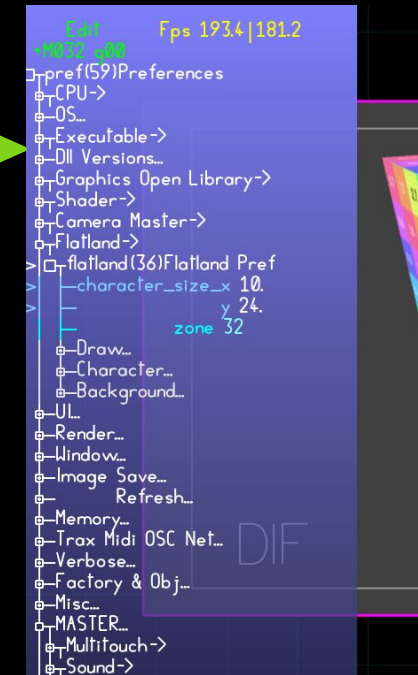
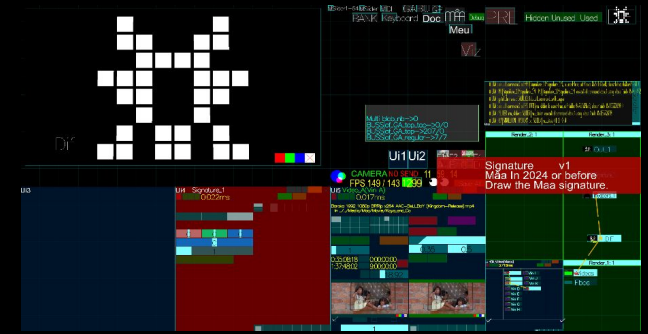
- keyboard first step

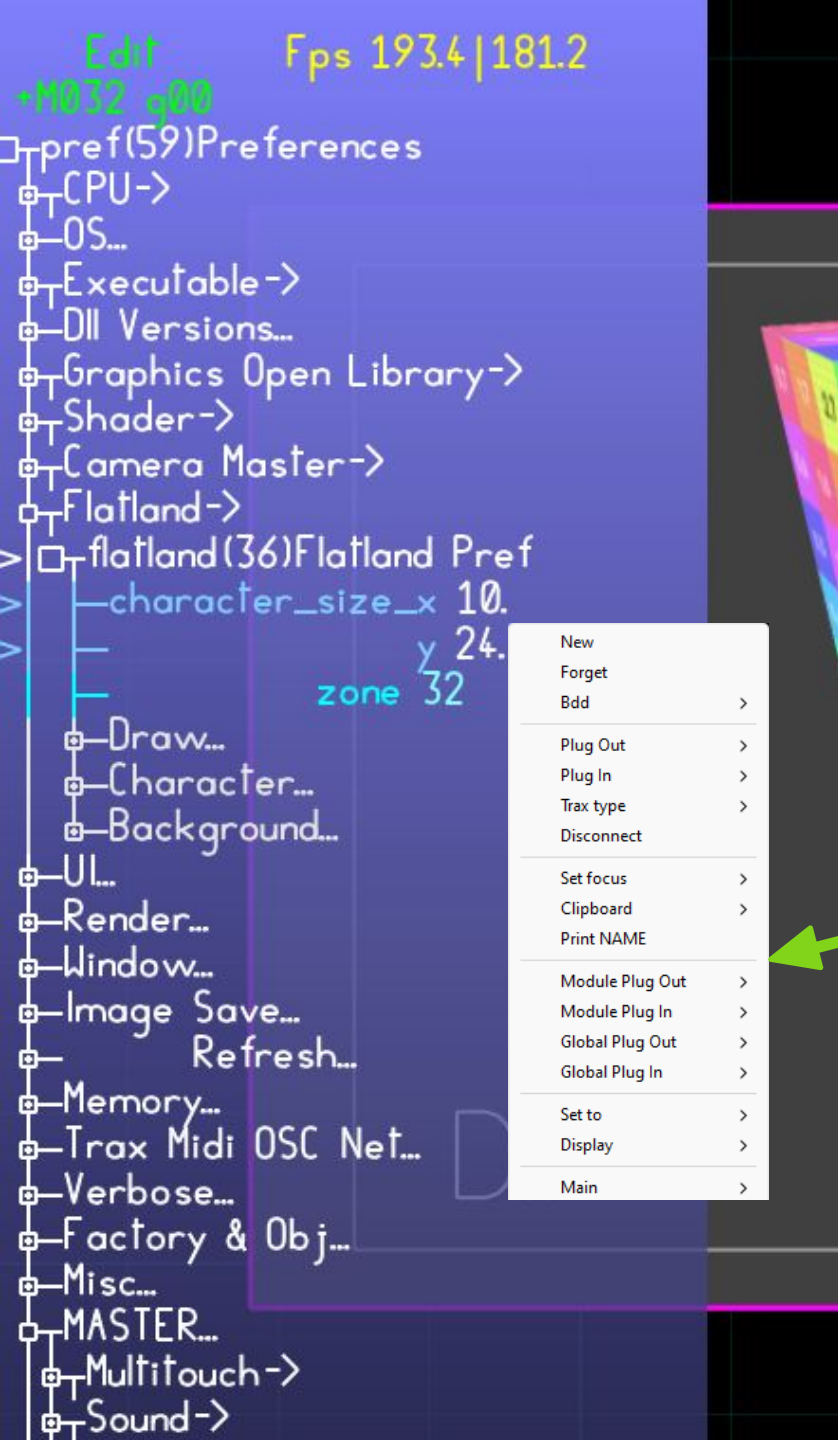
- w like (w)indow
switch between window and full screen Module
- Tab

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 ...

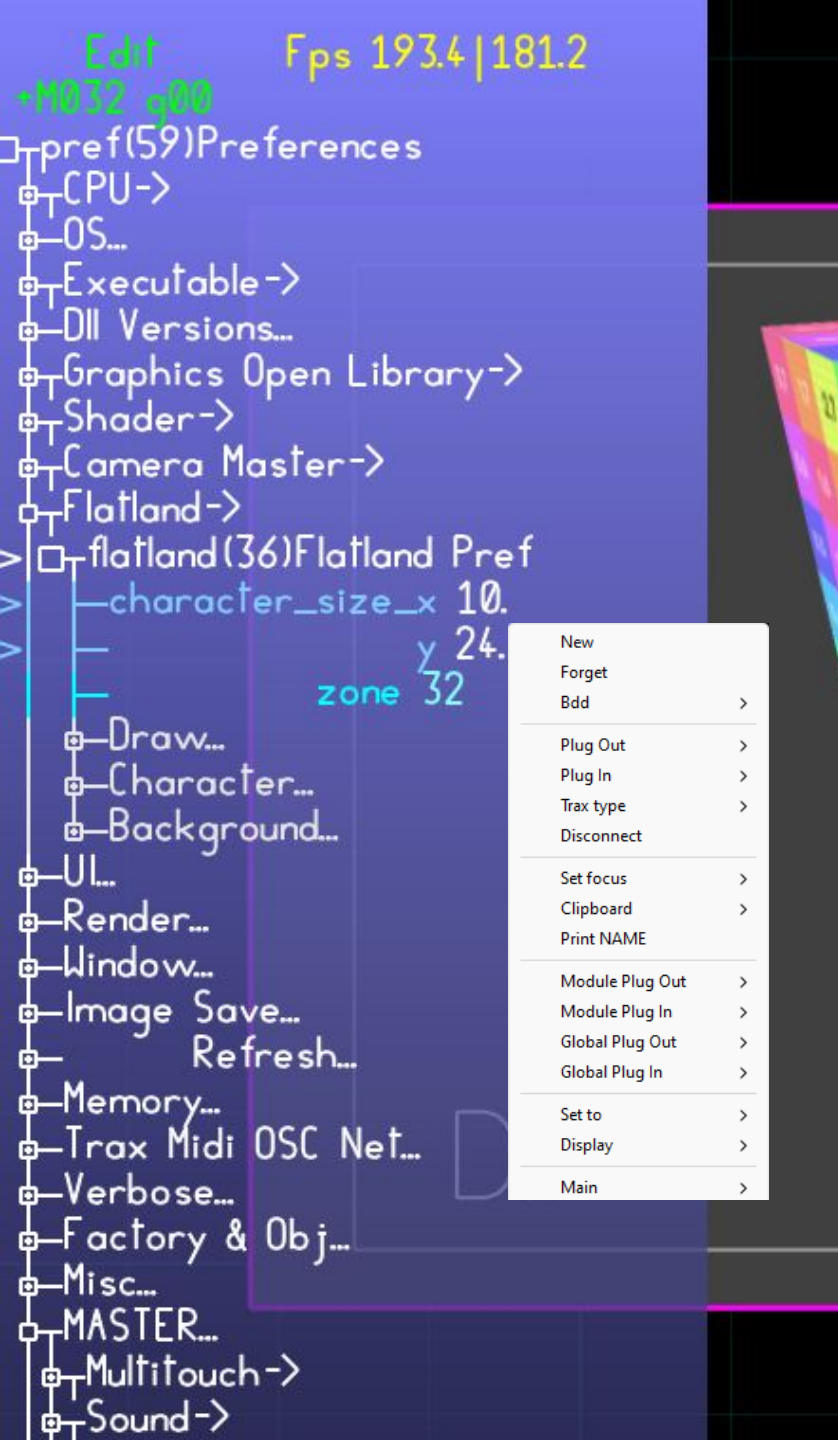
- Double Esc
Quit with saving global stuff
- Alt F4 or Mouse Right Button/Menu/Exit no save
Quit without saving global stuff
require a confirmation





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

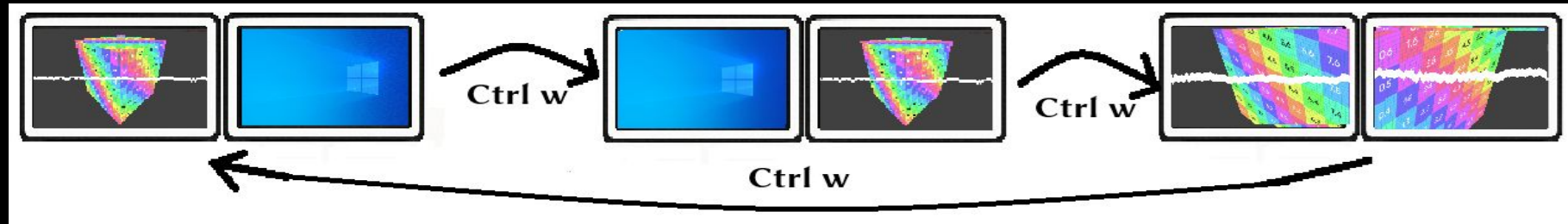


Flatland 101

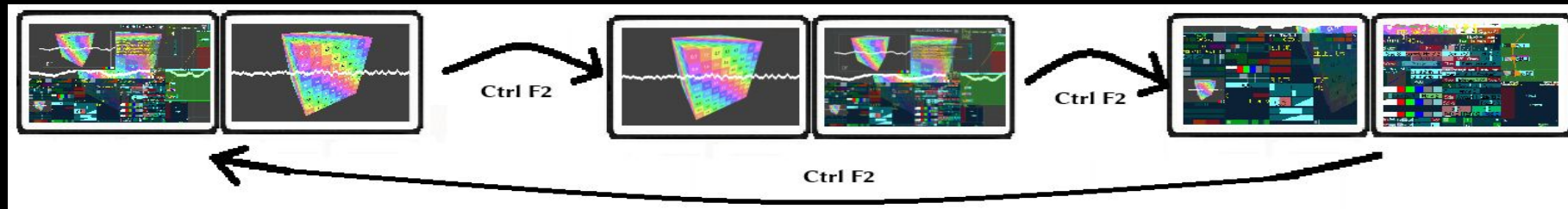
- Made of params (for parameters)
- Example: change values character_size_x/y
 - **F10** → Preferences
 - **Wheel** → Scroll
 - **Click (left Mouse Button)**
select / open
 - **Click and turn around starting Point**
change value
 - **Double Click**
edit dialog
 - **Keys + - * /**
change value
 - **Ctrl 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

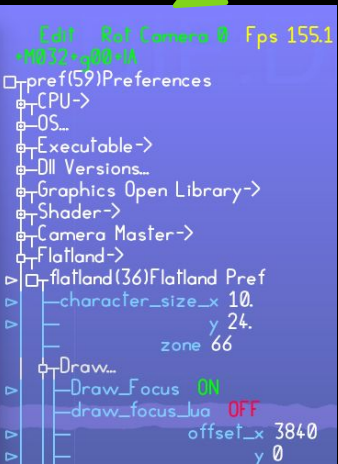
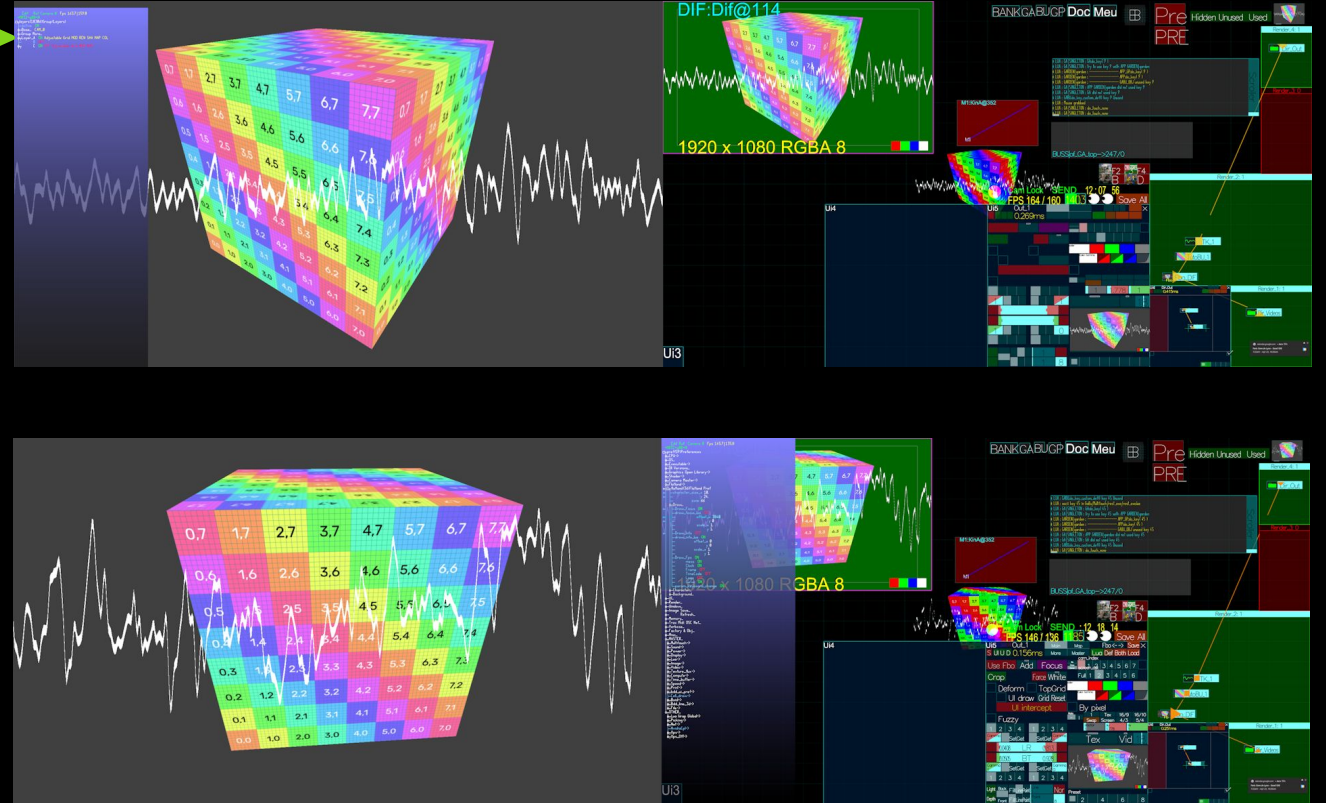
Flatland (Tab)

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**

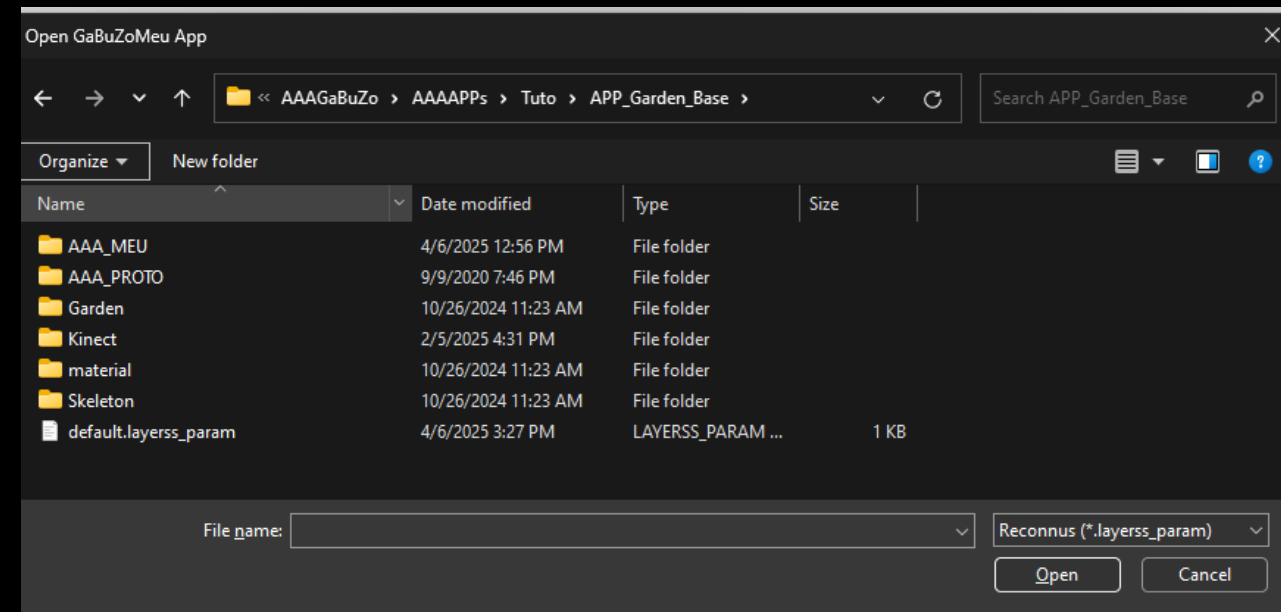
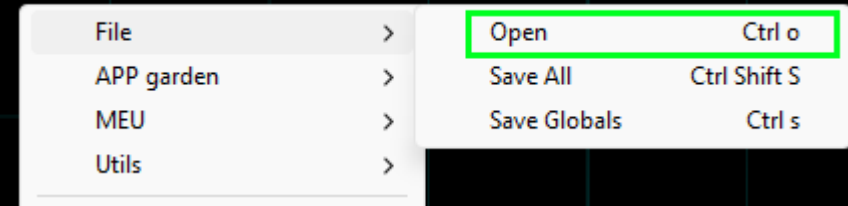
The APP is the folder

The folder is the APP

- Bug:

Sometimes you need to open it again

- **Name in the window bar**



D:/AAA/AAAGaBuZo/AAAApps/Tuto/APP_Garden_Base/ | AAASeed Plug In...

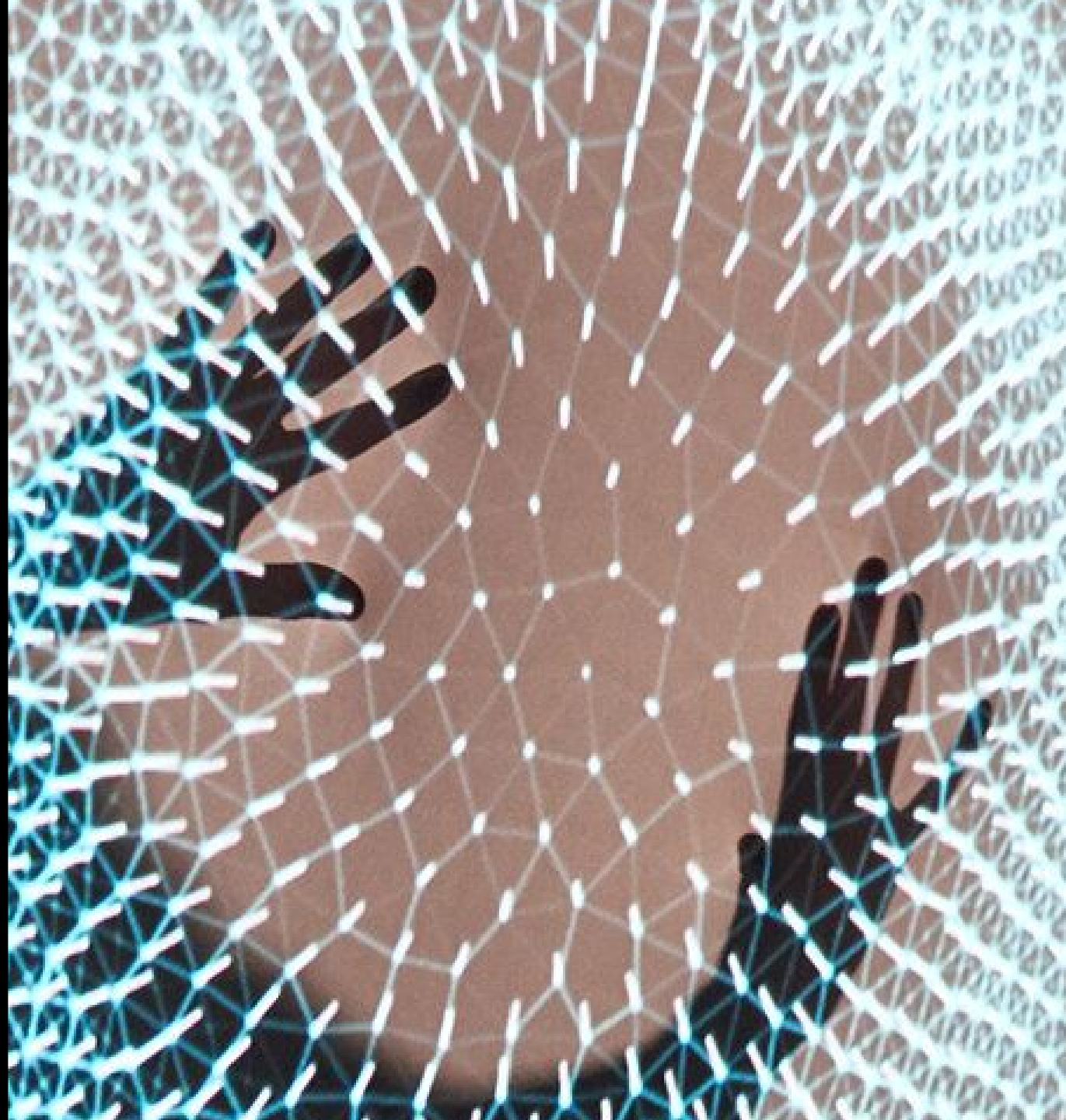
AAASeed

An introduction

Part 3:

BU is all you need

- Basic UI
- BU Box User
 - Resize Move**
 - StarMenu**
 - Dialog**
 - Current BU**
 - More on Resize**
- BU_MONITOR
 - Channels**
 - Alpha**
 - Click Zones**
 - StarMenu**



Basic UI

- **Don't be scared**

need to get used

but efficient

- **Careful with shift lock**
Dangerous → avoid

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

- **Ctrl F2**

Force the **GaBuZoMeu UI On** and **move it from screen to screen**

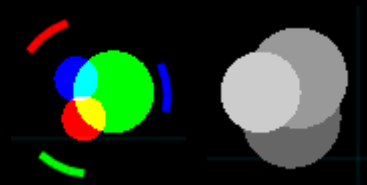
- **F2**

Switch the **GaBuZoMeu UI On/Off**

- **F3**

Switch the rendering process **On/Off**

BU_Alive visualize state



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

MEU

Module Editable Unit : an encapsulated functional Block

MU

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

MOUSE

Left Button

Action

Wheel Button

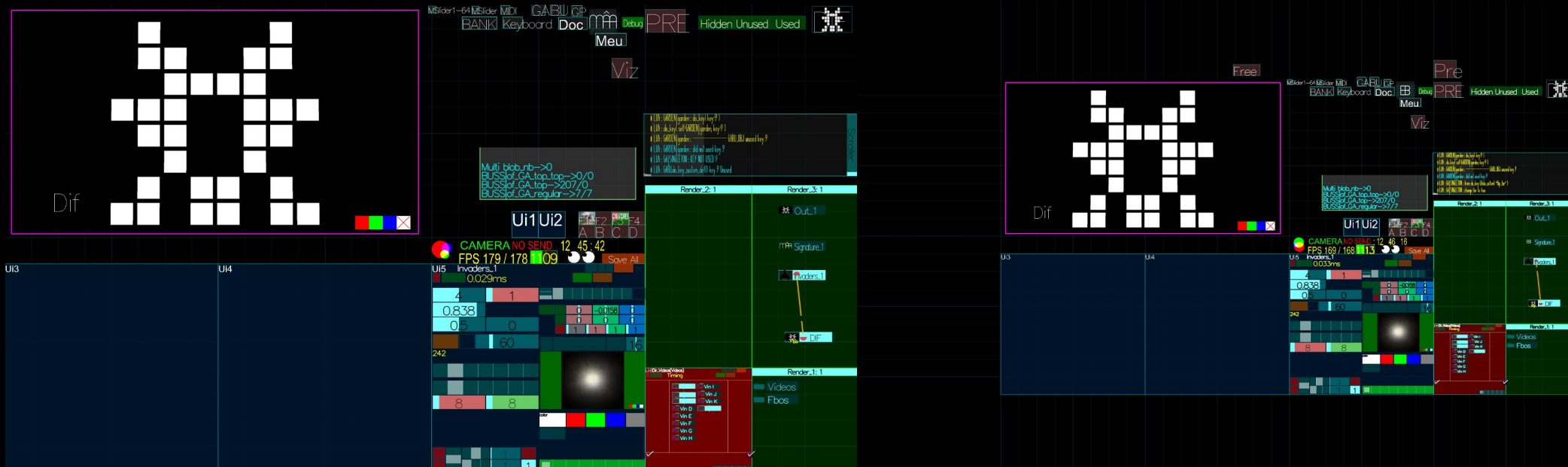
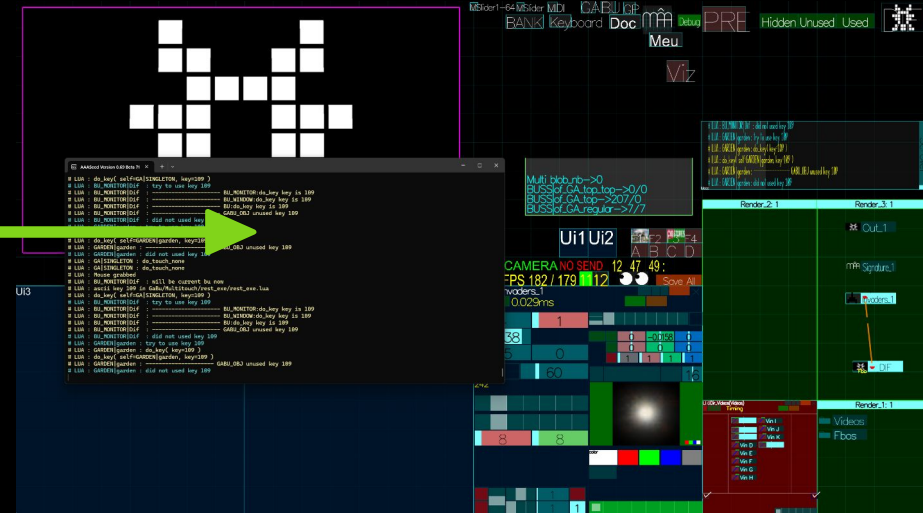
Scroll

Right Button

Menu

Basic UI more

- m like (m)essage
pop the terminal window
- Ctrl Tab
flip the UI Scale (between 2 sizes)



BU Box User

- Every UI element is a **BU**

BU can contain **BUS**
BU / BUS / BU / BUS ...

- To see this 
Click on the icon of TutoBU_1



- **Click**

- Done with **left button**

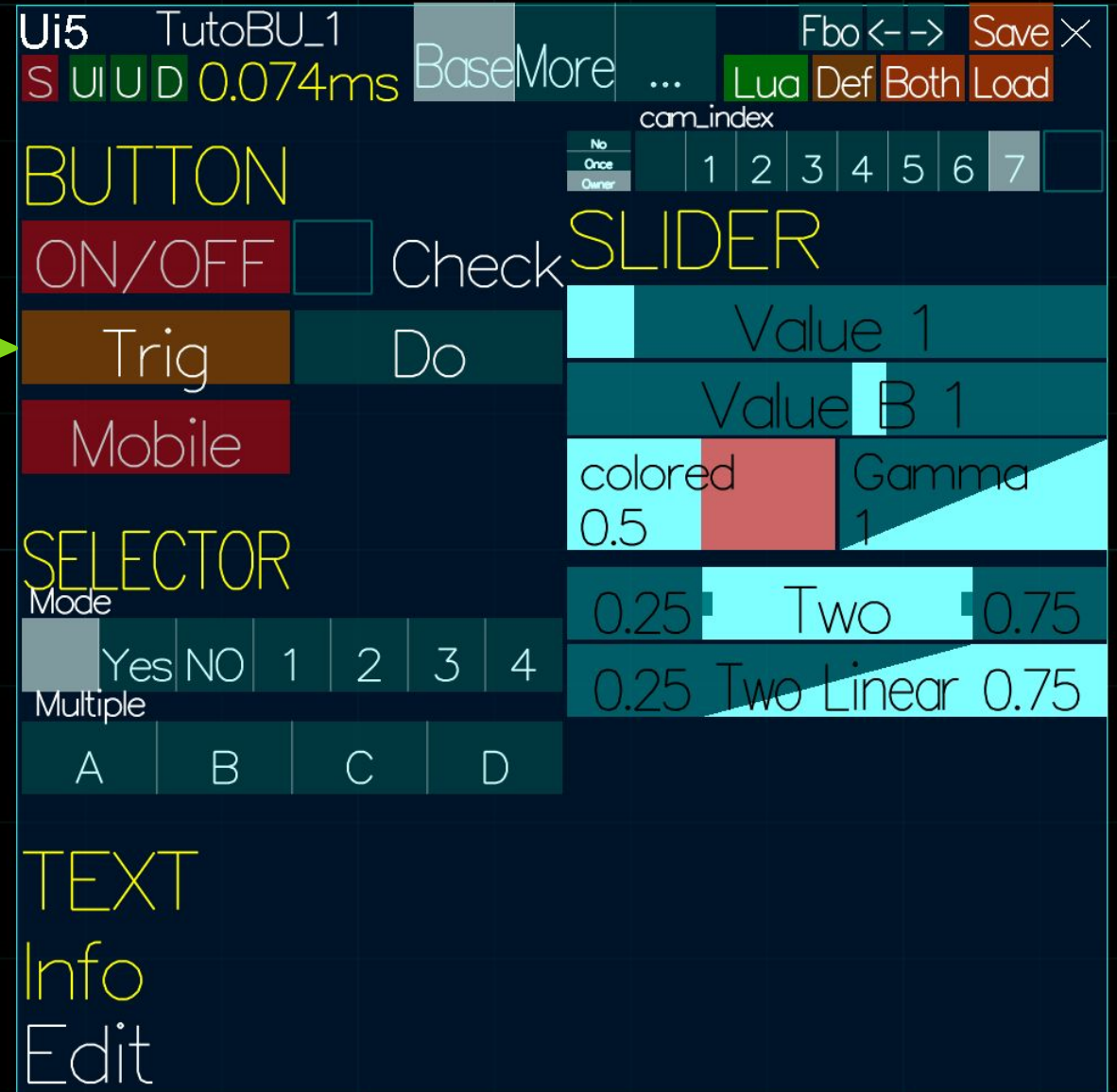
- **4 types**

Simple

Double

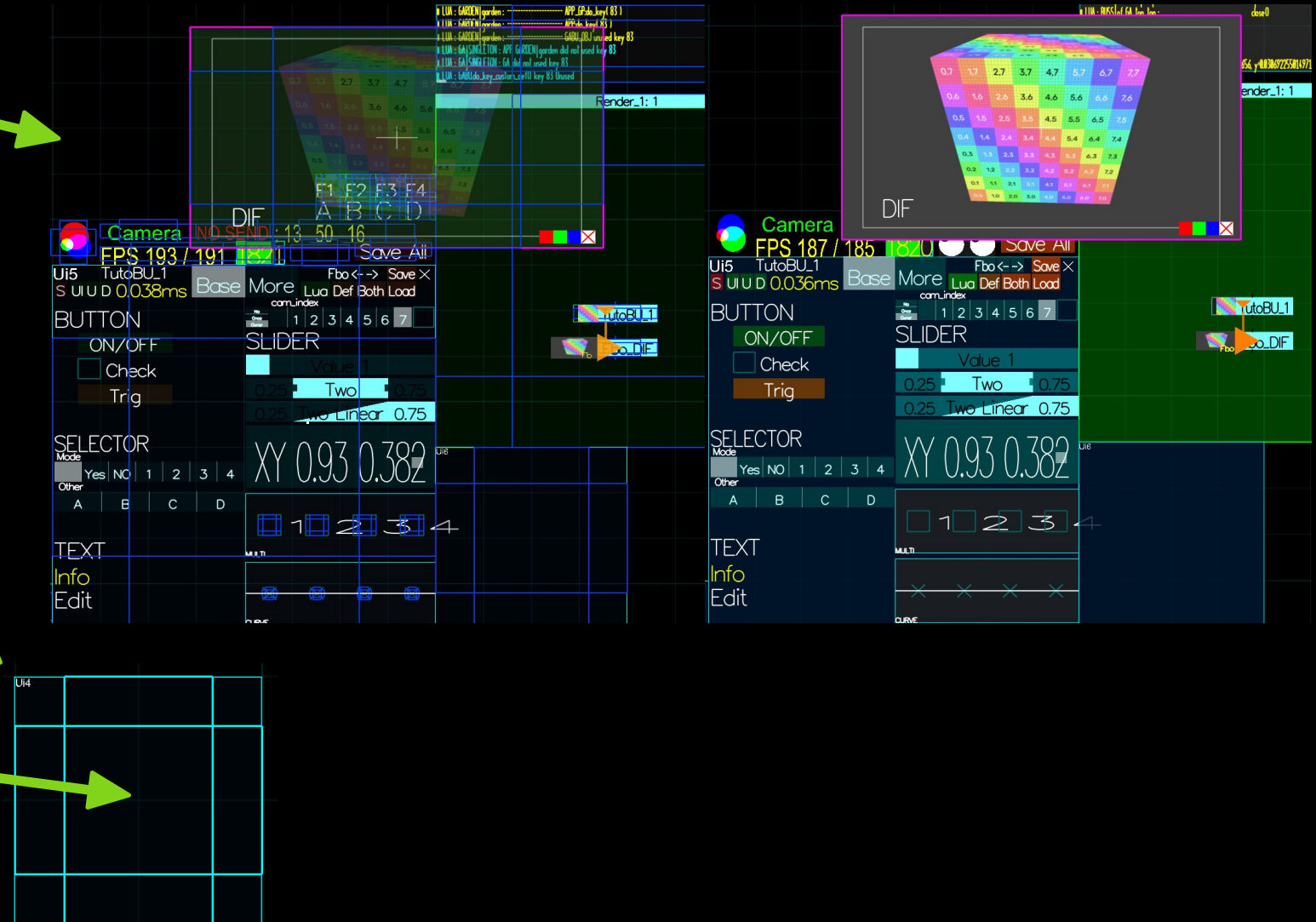
Triple

Long (stay fix with button down)



BU Resize Move

- Maintain Alt
 - Transparency
 - Blue Flashing Frame
 - Click with Alt
 - Move
 - Resize
- You can see under
- Central zone
- 8 external zones



BU StarMenu, Dialog

- Click on TutoBU_1 slider



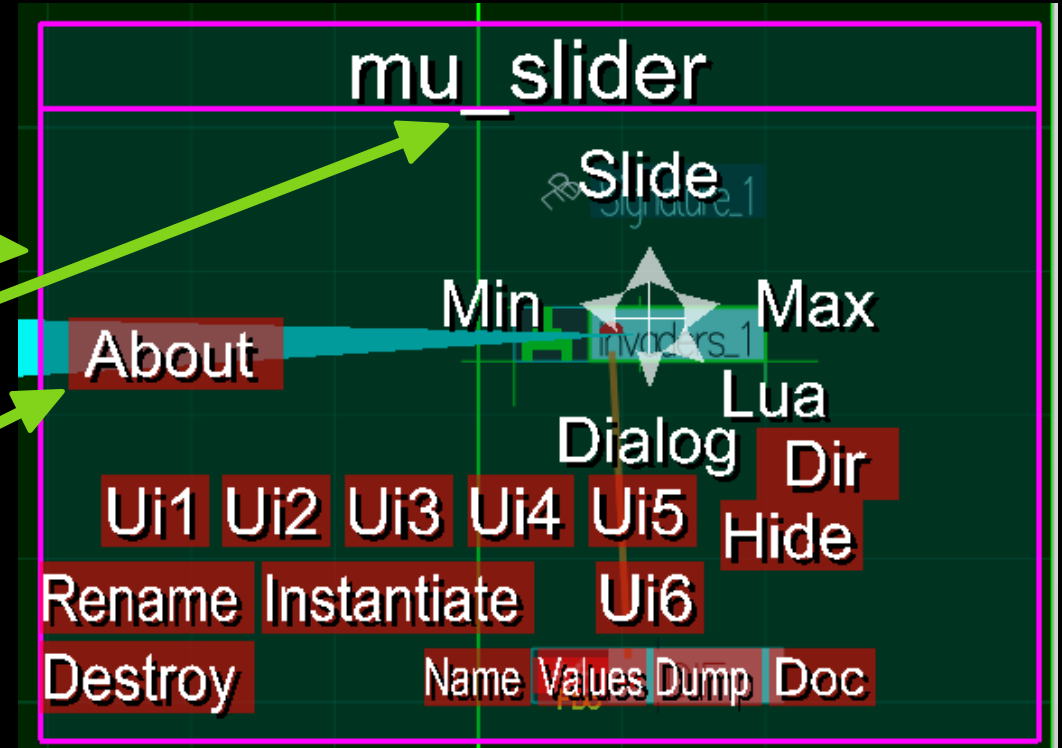
- StarMenu**

Also named UIF for UI Fast
a proximity UI

Context Menu with

- Zones
- Button
- Name of BU

- Example: use **About** button



- Dialog**

Flashing Red for attention

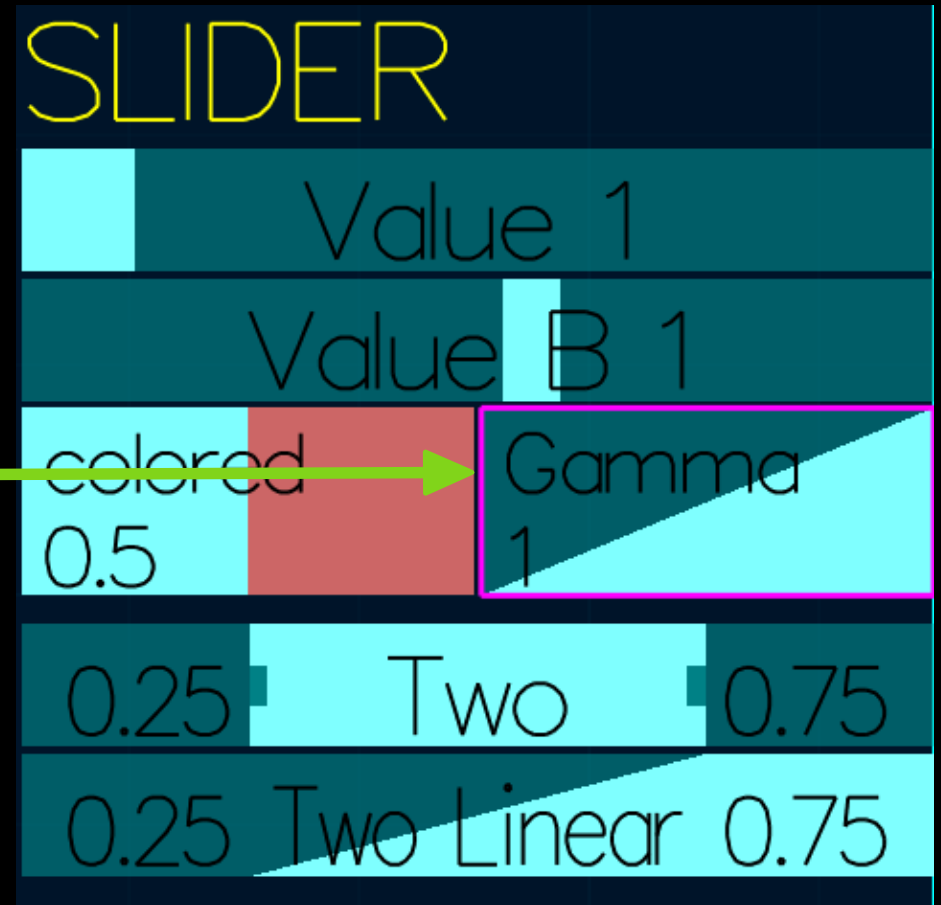
Move / Resize using Alt as Always

Click to remove



Current BU

- When a BU is **clicked** it becomes **current**
- **Violet frame** ←
- **Receives keyboard**
- **Arrows move/change it** need to be refined in some cases (2025 May)



BU more on Resize

- **Alt click** move resize

Alt Arrows **Move**

Alt + - * / **Size**

- 3 states: **Normal** / **Full** / **Mini**

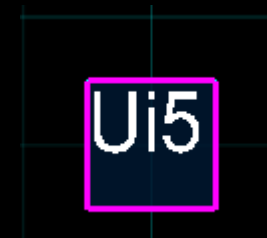
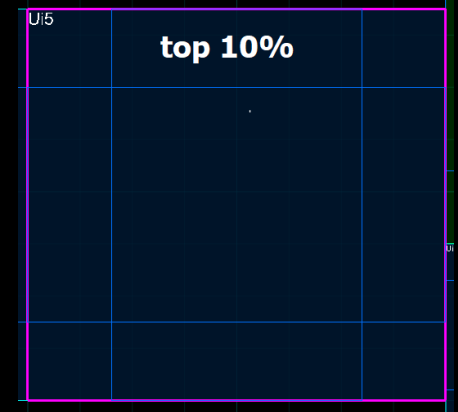
Double click **Normal ↔ Full**

Double click in top 10% → **Mini**

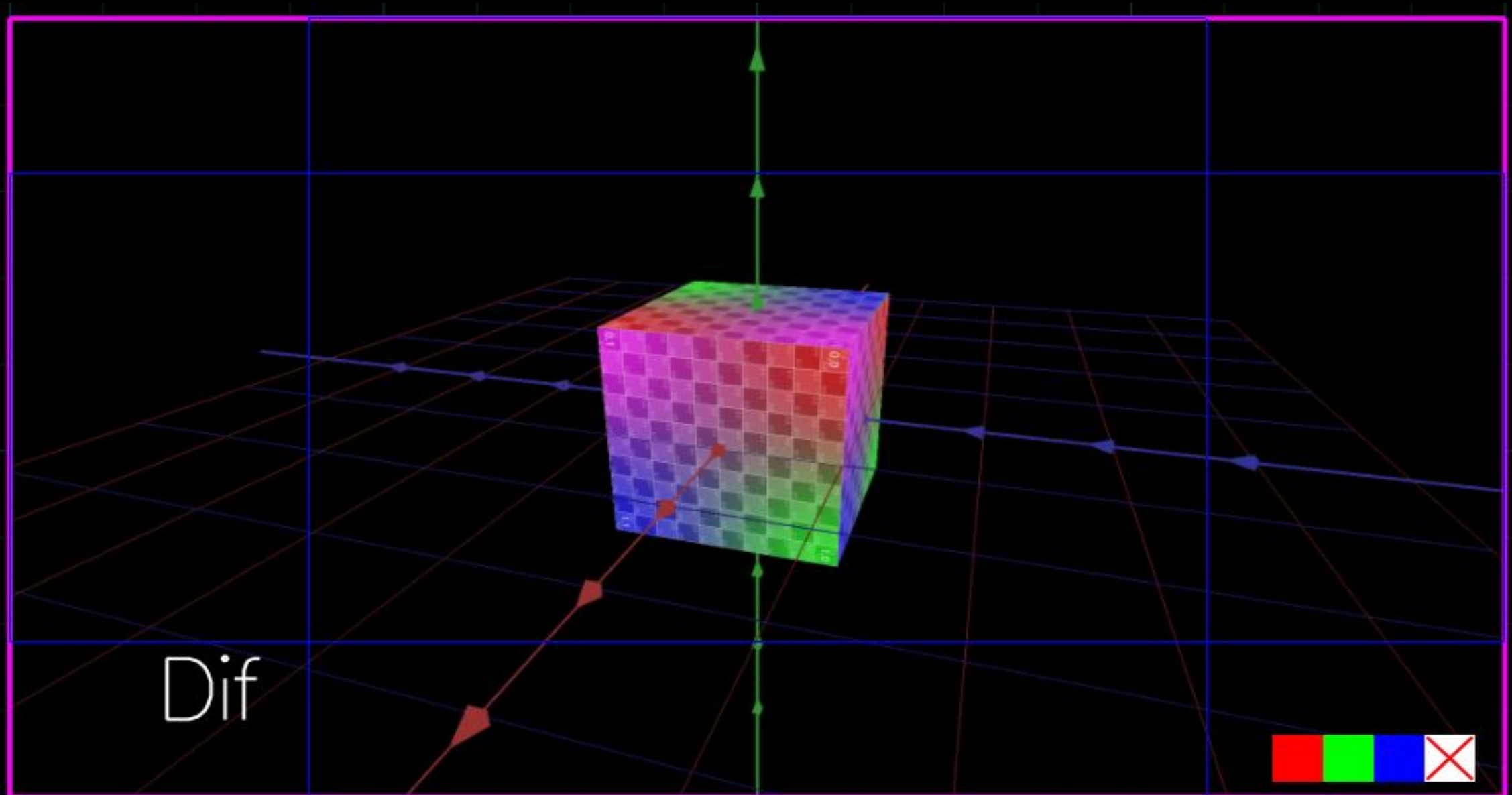
- keyboard

Space **Normal ↔ Full**

Ctrl Space **Normal ↔ Mini**



BU_MONITOR Move/Resize as usual (Alt...)



BU_MONITOR Channels

- In fact it shows textures
- Textures have a number of channels

1 or R for Red

displayed as grey

2 or RG for Red Green

displayed as yellow

no Blue

3 or RGB for Red Green Blue

full color

4 or RGBA for Red Green Blue 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

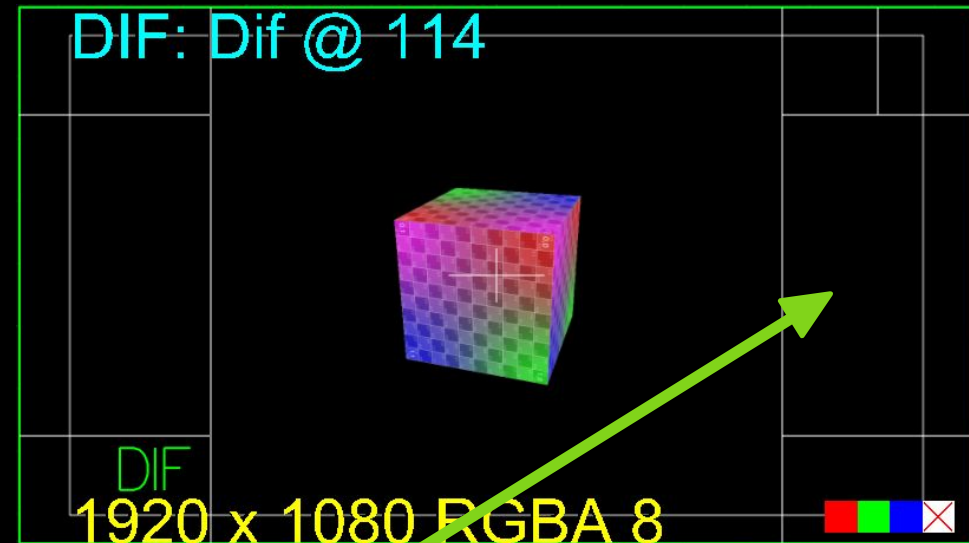


DIF
1920 x 1080 RGBA 8



BU_MONITOR Alpha

- Click zones

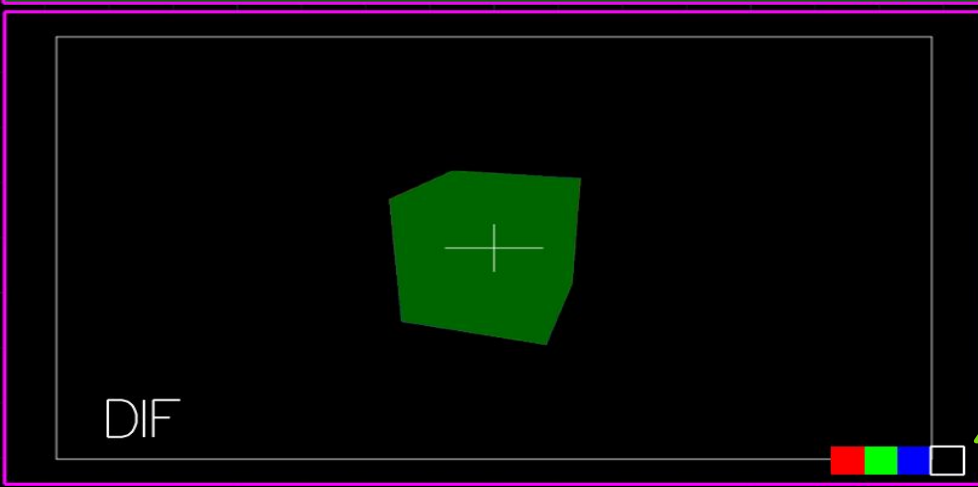
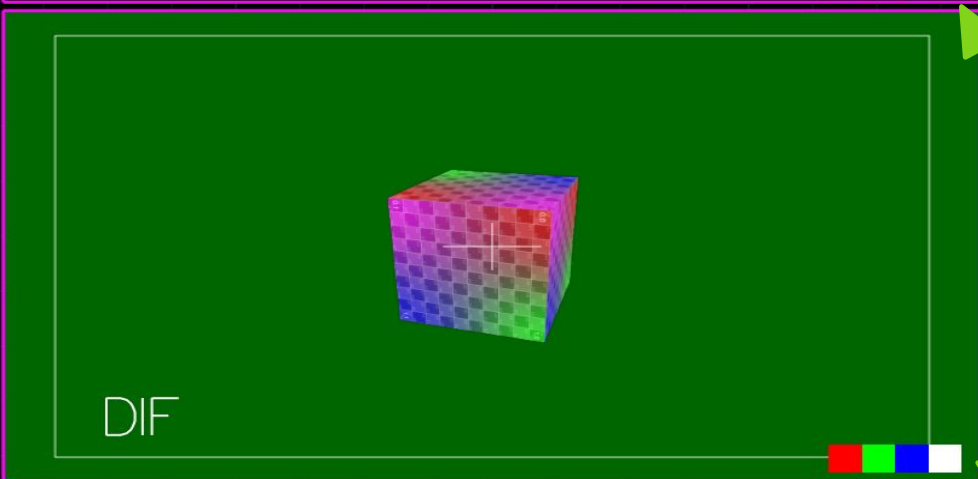
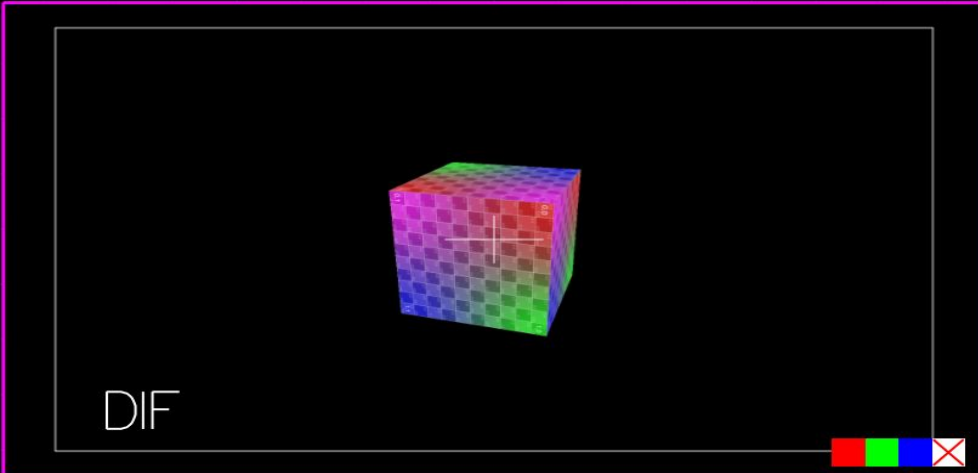


- Click Right Middle

change how

alpha is displayed (only RGBA)

same as **Key + / -**

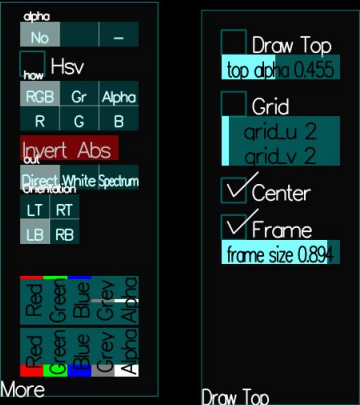
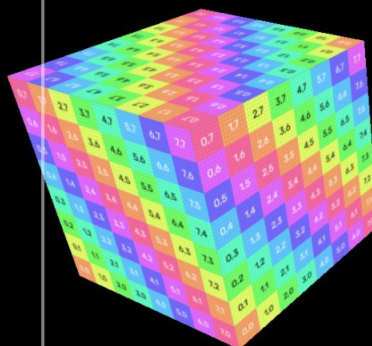


BU_MONITOR Click Zones

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

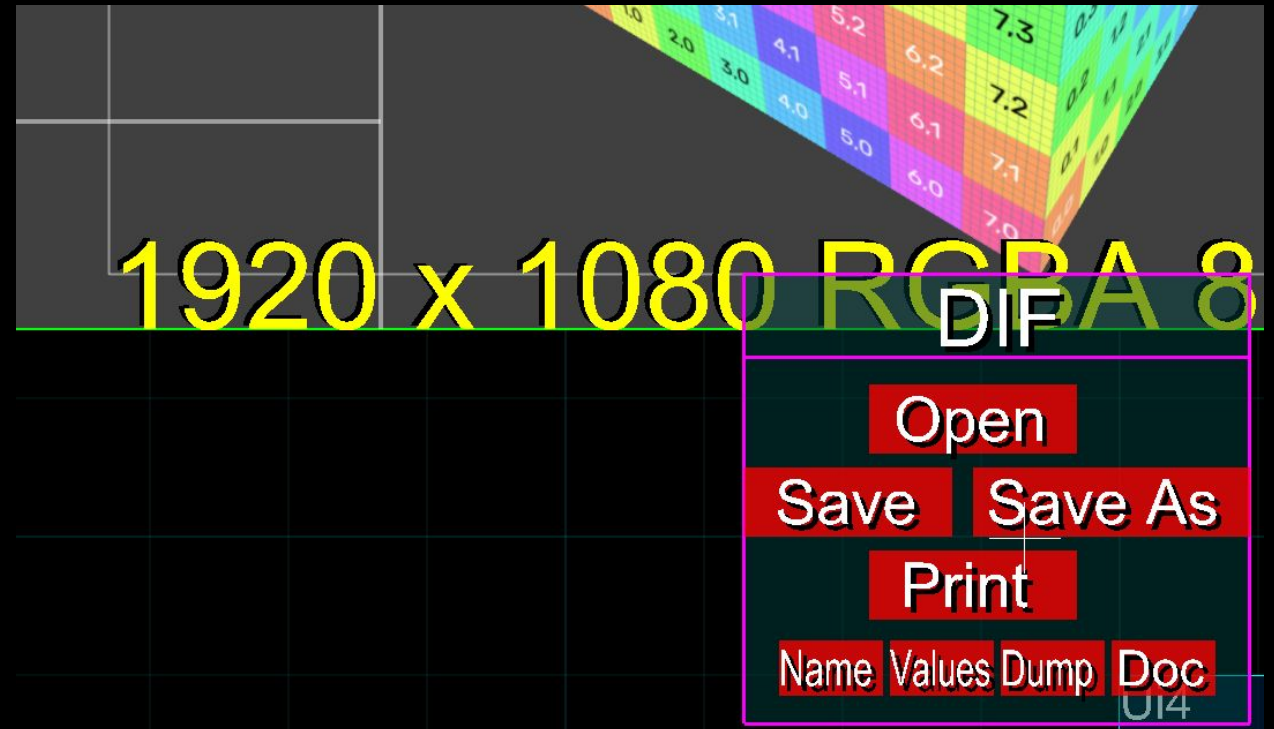
Flip
Alpha Mode
or Key + -



Flip
channel
display

BU_MONITOR StarMenu

- **Click and drag out quickly**
like any BU where it doesn't appear directly
- **Open**
Load an image with a file dialog
at the current bind
later on this
can choose several files
loaded in successive binds
- **Save**
Save the Image
In Media/AAASnapshots
How it is saved
in Flatland/Prefs/Image Save
- **Save As**
idem but with a file dialog
- **Print**
Print
How it is printed
in Flatland/Prefs/MASTER/Print



AAASeed

An introduction

Part 4: Meet the BUs

- Basic BUs

BUTTON

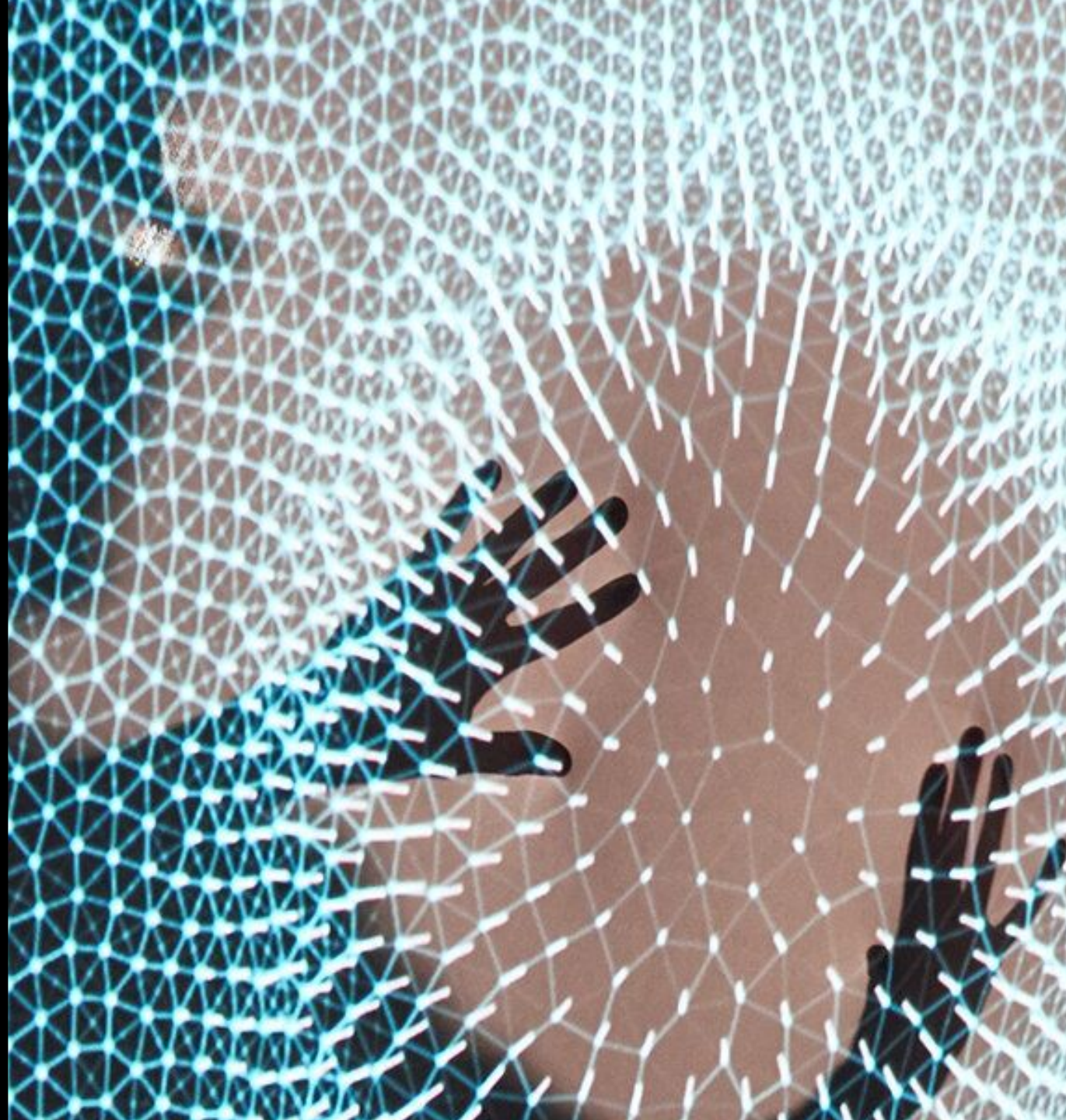
SLIDER

SLIDER_TWO

SELECTOR

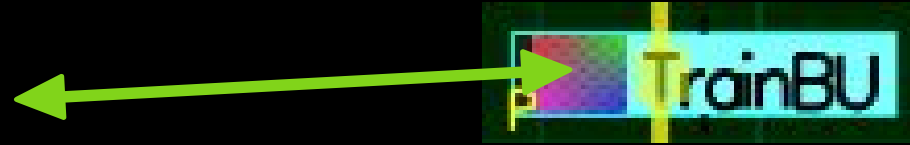
BU_TEXT

- Others BUs
- Copy / Paste
- Undo / Redo

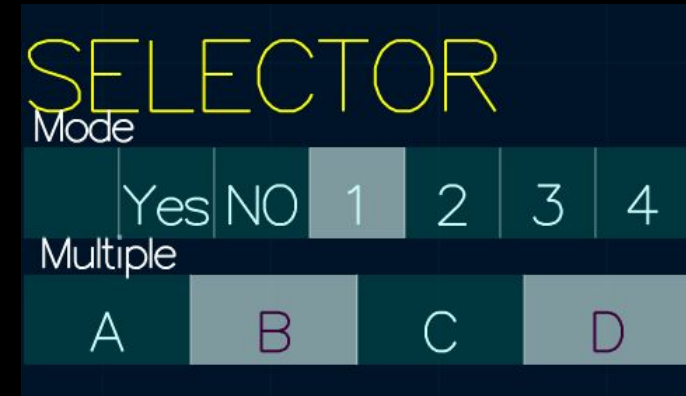


Basic BUs

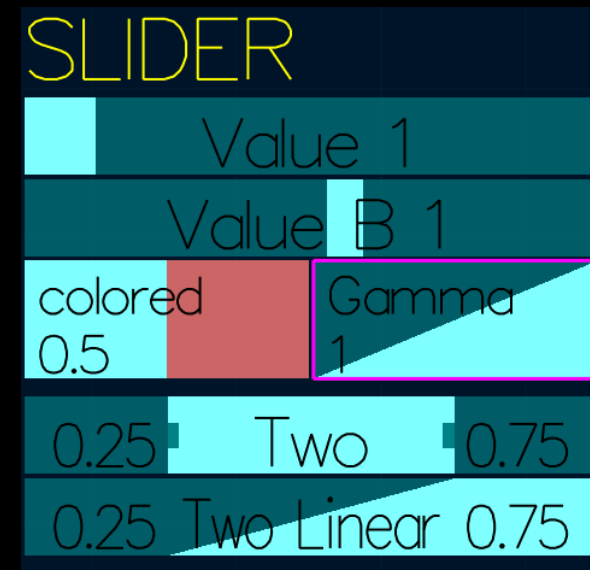
- Click on Train_BU icon



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

with eventually confirmation



Could be **movable** too (Alt)

StarMenu Access

- Go out quickly



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

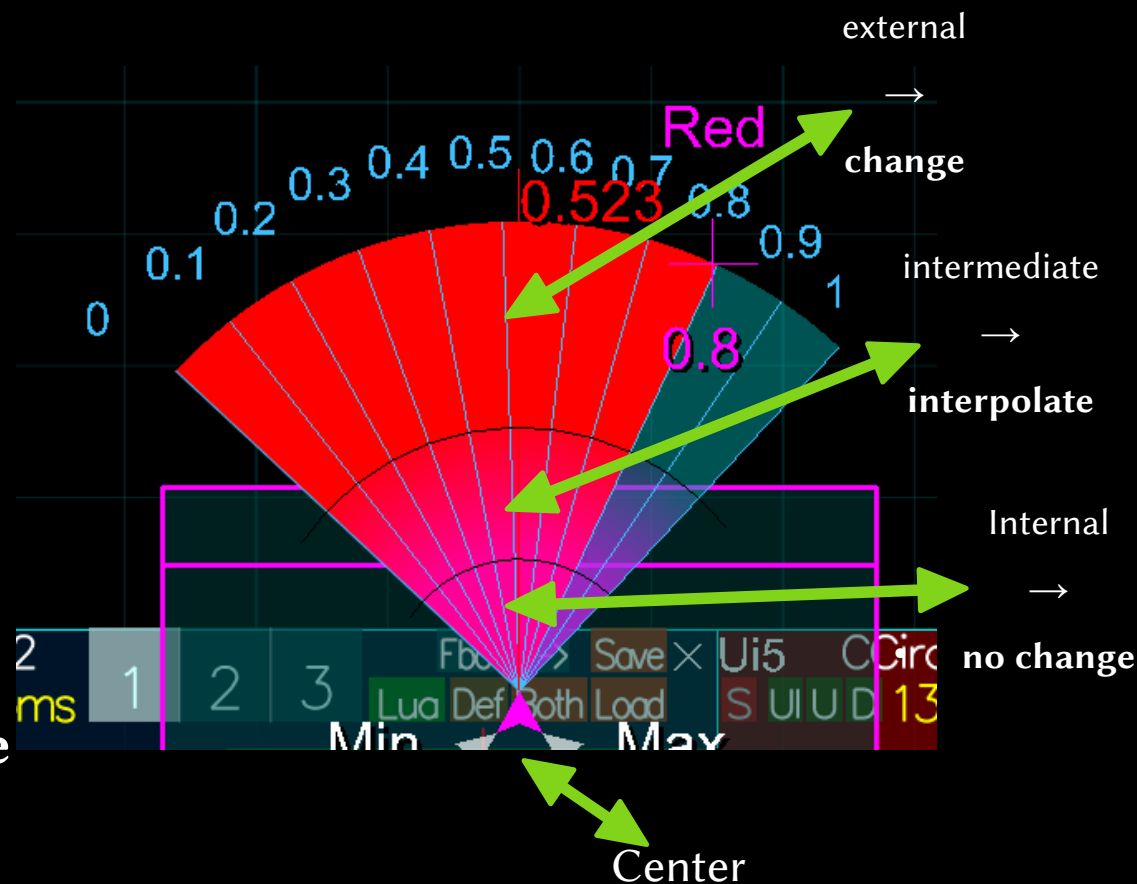
the more away the more precise

Go back to internal circle to cancel

Shift → lock on closest default value

Ctrl → smaller change from start value

Ctrl Alt → even smaller change

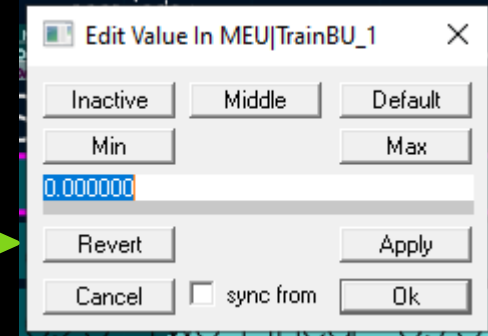
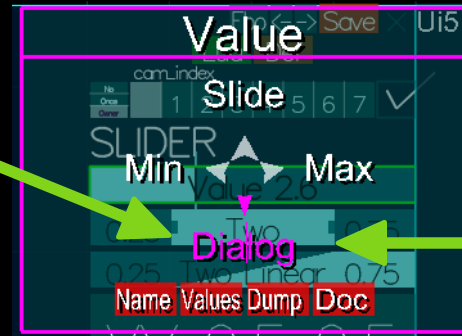


SLIDER

- **Min / Max**
defined with each slider



- **Dialog edit**
Double Click or Dialog



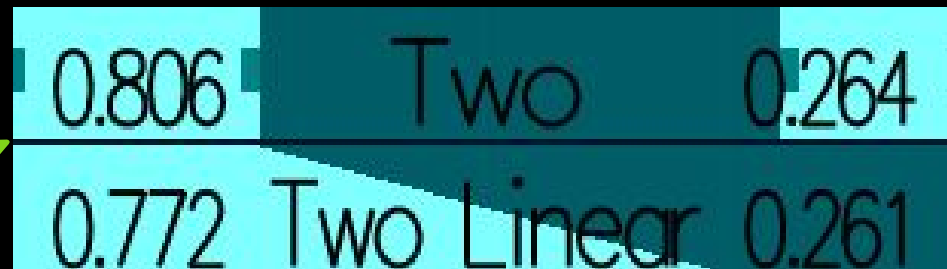
- **Keys**
current BU and no Flatland
 - + - * / → change
 - Enter → inverse
 - . → floor integer
 - Home → Default
 - End → Inactive
 - PageUp → Maximum
 - PageDown → Minimum

- Can be **Floating point or integer**
- Constrained or not by Min and Max

SLIDER_TWO

- Same but **2 values**
- Range / Linear
- Depends **where you click**

Closest value is selected for interaction
Keys change last value used



- Can be **Flipped**
Left bigger than right

SELECTOR

- Click
 - Keep mouse down
- Change with mouse



- Access to StarMenu
like **BUTTON**: go out quickly
- Use **keyboard** as for a **SLIDER**
+ and - mainly
- **Multiple selection** an option
display frame around each item



Back to Slide

- Slide functions for selector too

Go up

then angle

Shift

lock on values

Ctrl or Ctrl Alt

sensitivity

- Keys as usual

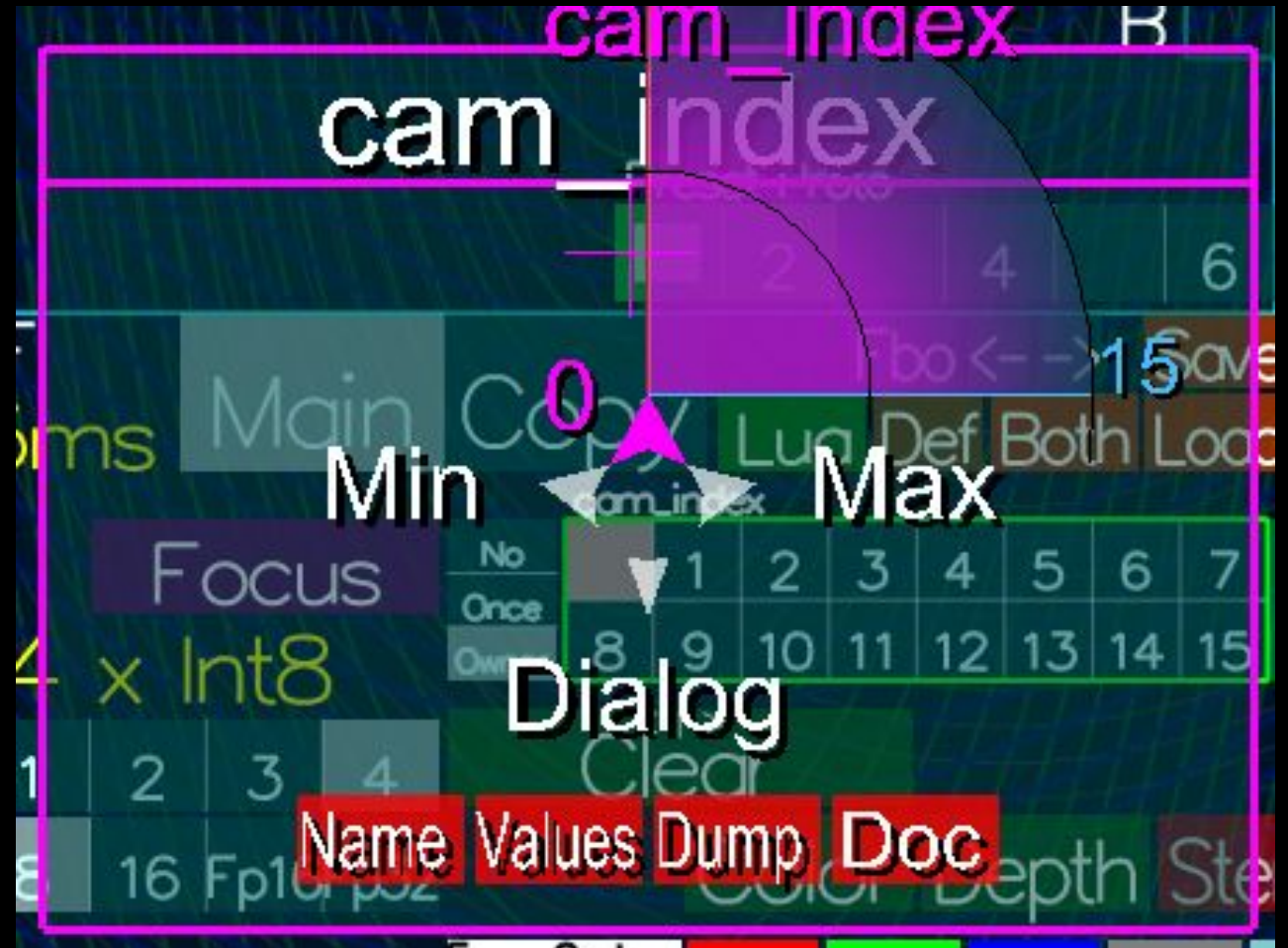
+ - * / → change

Enter → negate

. → floor integer

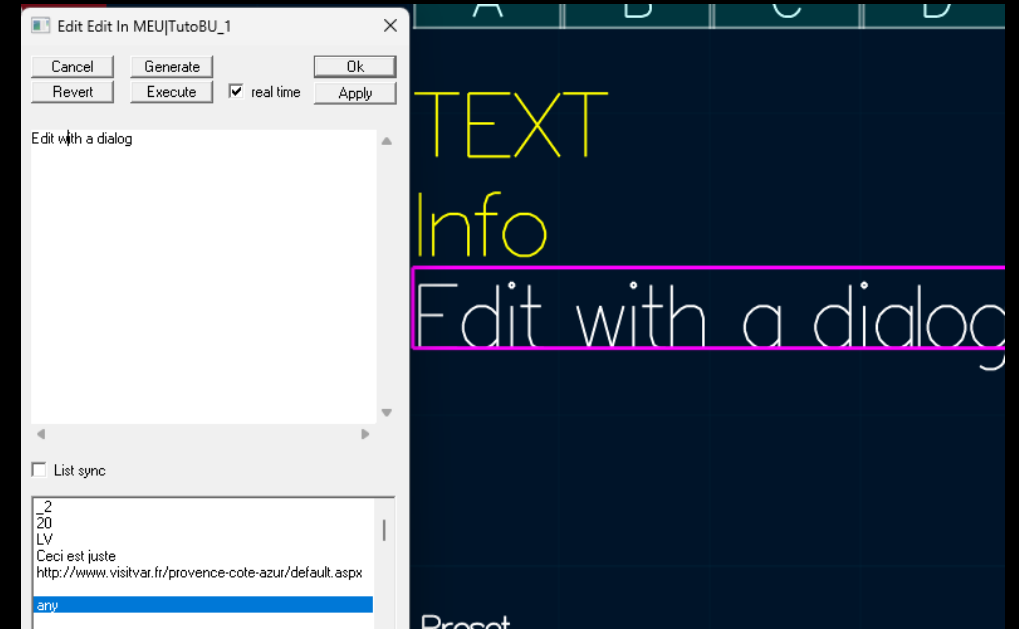
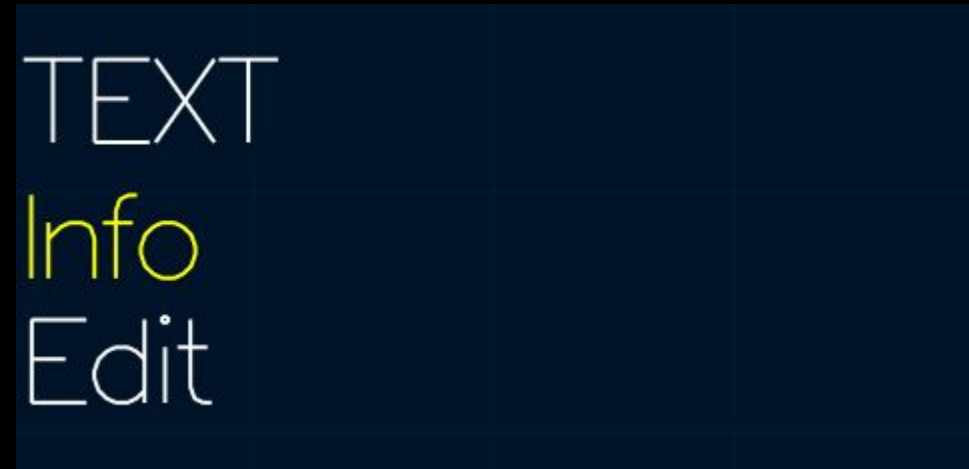
Page Down / Up → Min / Max

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**
 - go out quickly
- will Evolve
- Dialog will Evolve too
- Virtual keyboard exists but not functional at the moment (2025 May)



Other SLIDERs

- Select More in top Selector



- SLIDER_XY

2 values x y

- SLIDER_MULTI

several x y size_x size_y
use Alt to Resize

- 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 a bu_group
colors for example**

**Copy / Paste a meu
see later**

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 May)**
treated as a **series of individual actions for now**
instead of a global change

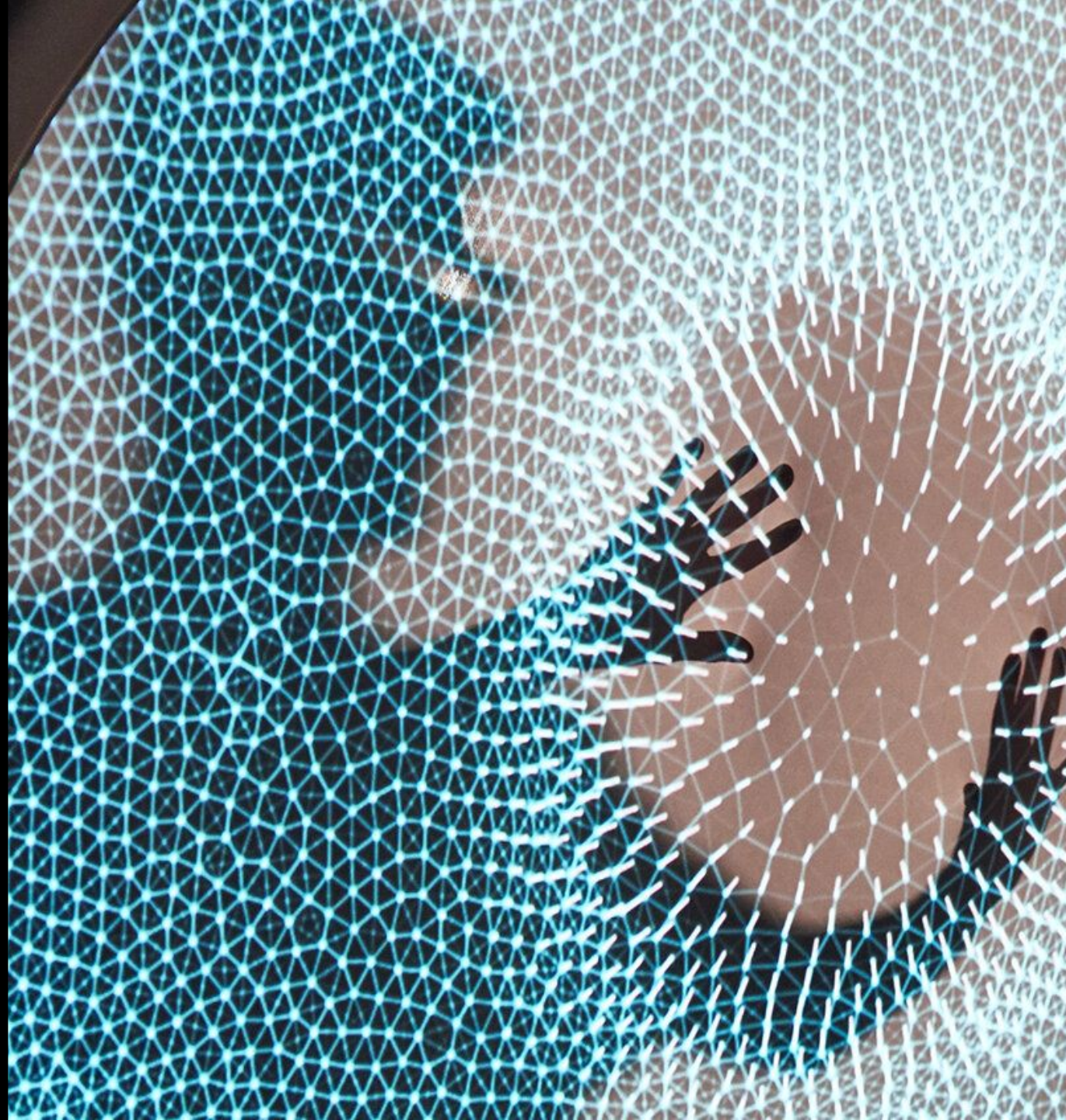
AAASeed

An introduction

Part 5:

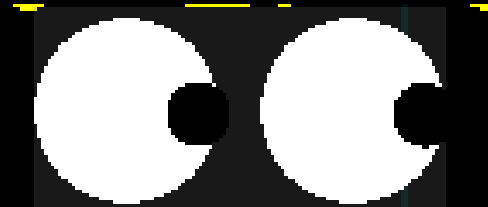
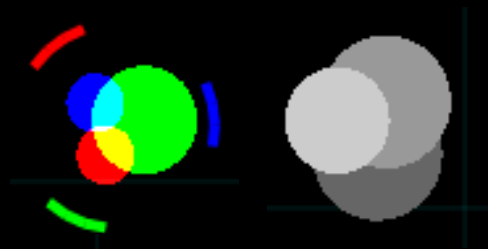
More BU

- BU_VIZs
- BU_MESS
- BU_SHOW



Some BU_WIZ (Wizard)

- **BU_ALIVE** show/control rendering F3
- **BU_FPS** Frame Per Second **FPS 153 / 145**
FPS in Flatland: can fps with no UI
- **BU_TIME** show time **23 : 26 58**
- **BU_EYE** show mouse direction
- **BU_CAM** control editing of camera **CAM Locked**
- **BU_SEND** control synchronization between machines **NO SEND**
- **BU_MEM** show memory used 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 pool of **message**

Messages color have a **meaning**

Error

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

Debug

Info

BU_SHOW

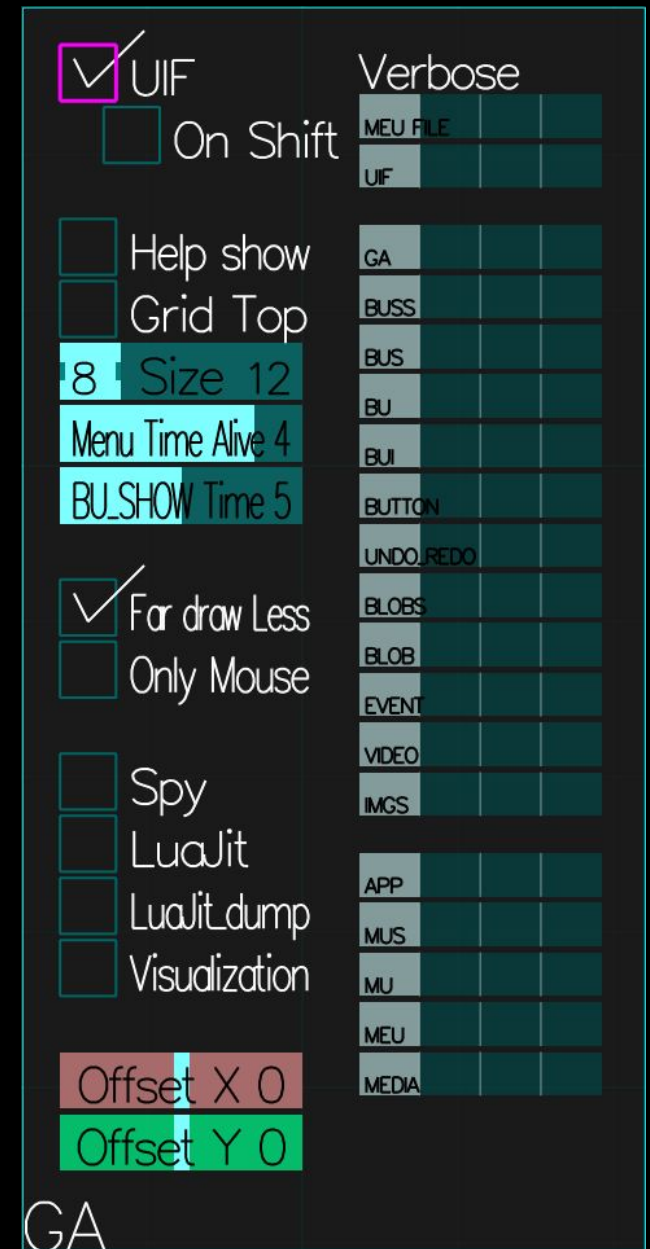
```
Multi blob_nb->0  
BUSSof_GA_top_top->0/0  
BUSSof_GA_top->220/0  
BUSSof_GA_regular->7/7
```

Good tool for debug

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

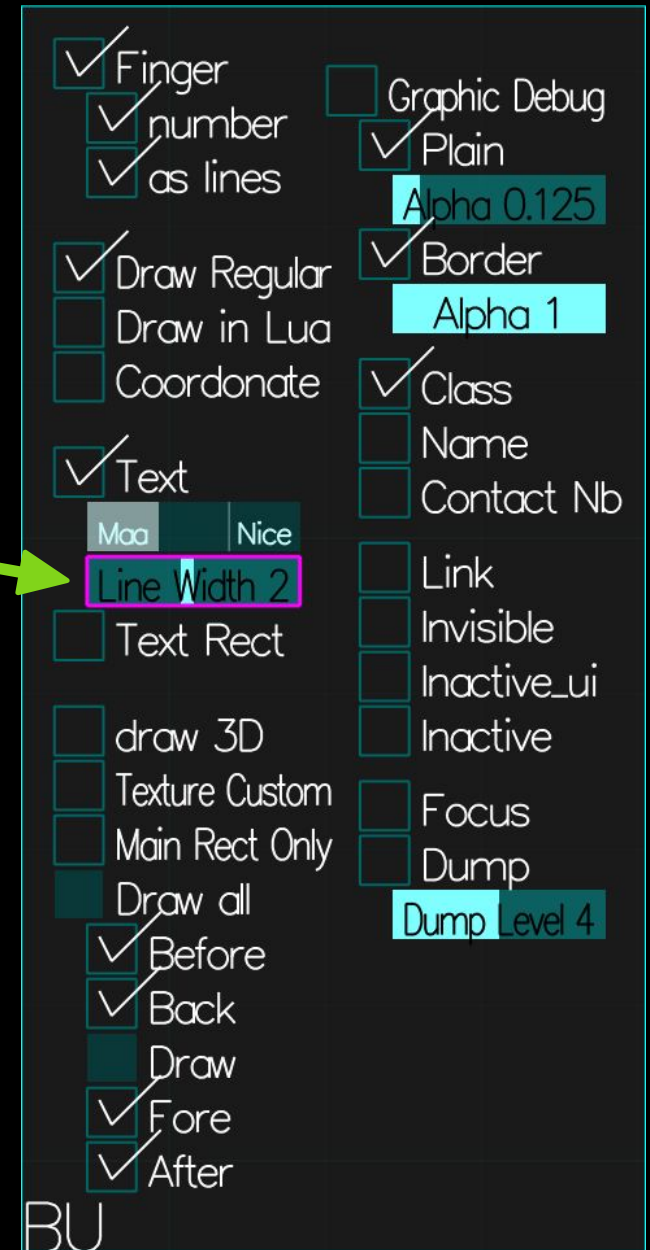
Window GA first look

- Global Action
- For now
 - **UIF** (UI Fast for StarMenu) → enable the **StarMenu**
On Shift → **StarMenu** appears with left click or **Shift** left Click
 - **Help Show** → same as **F1** and **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**
 - **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



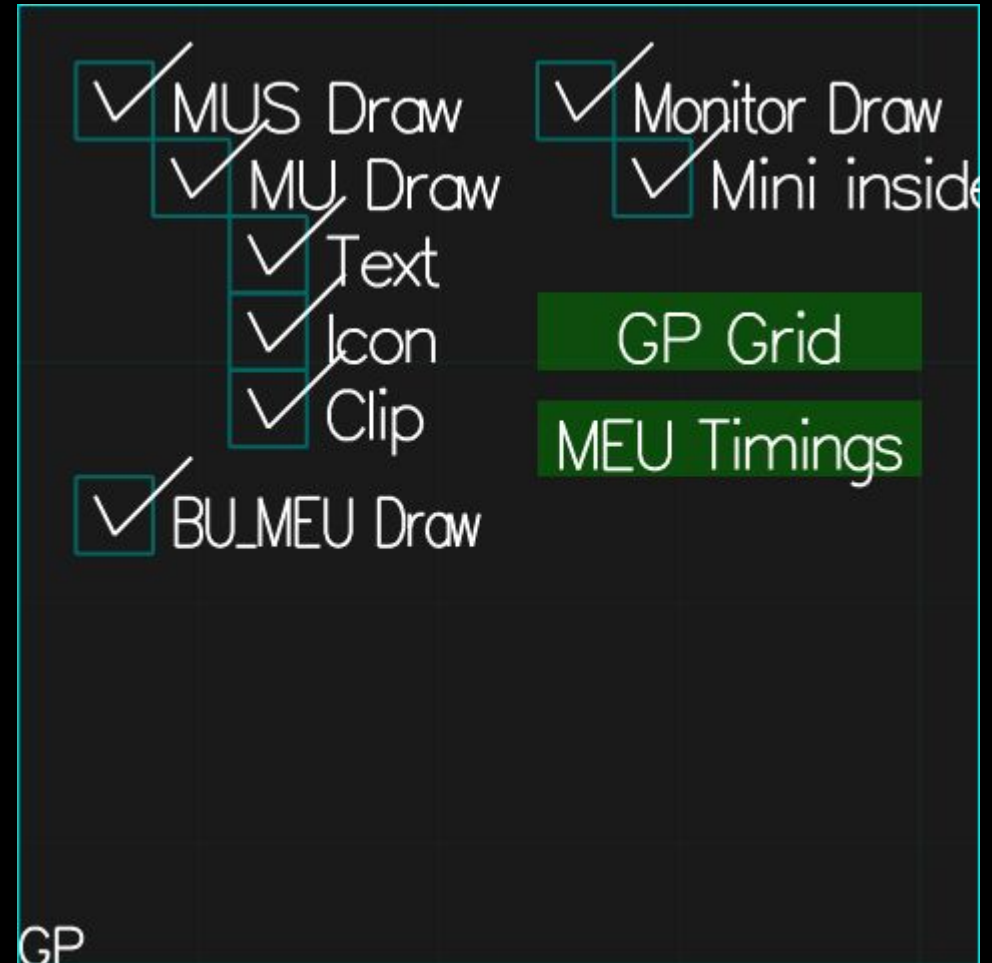
Window BU

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



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
- **GP Grid**
Control the light grid drawn under the UI
- **MEU Timings**
Control if the MEU measure their timing
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



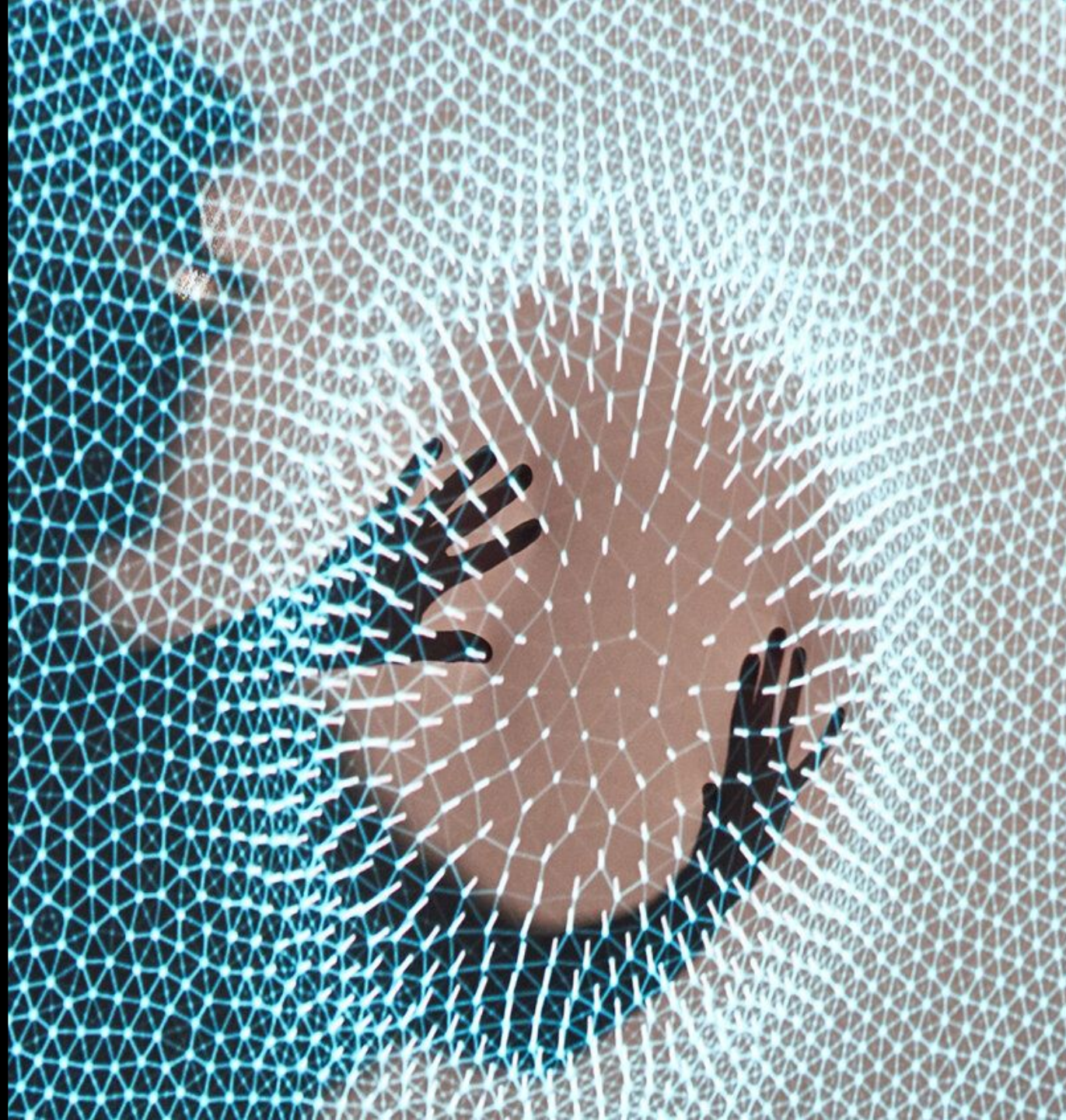
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An introduction

Part 6:

MEU

- MU / MEU
- MEU and UixRendering Chain and BU_RECT
- MEU Bar
- Preset
- Rendering Chain and BU_RECT
- MU Slider / Alpha
- BU_RECT
- MEU Seen MEU search
- MEU_DIR
- Cameras
- Axes
- Flatland



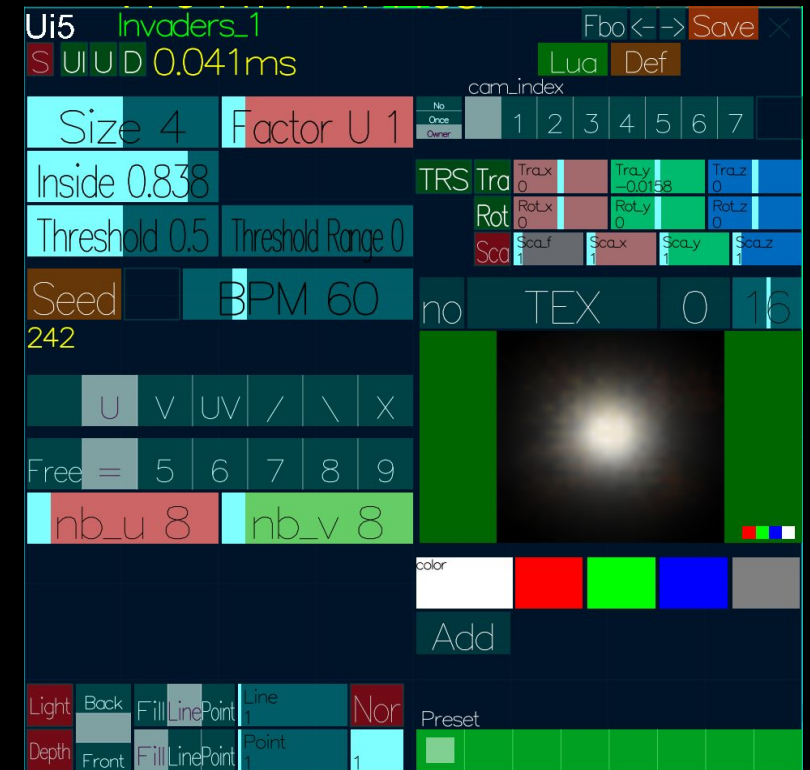
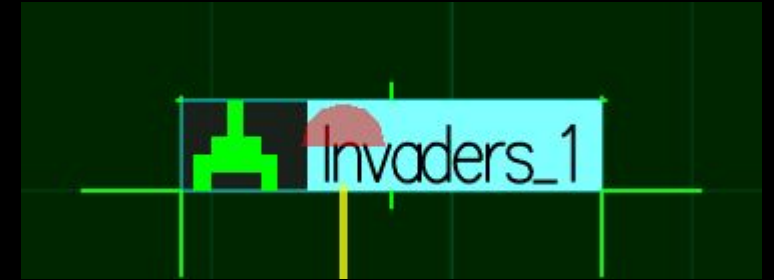
MU Module Unit

MEU Module Editable Unit

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

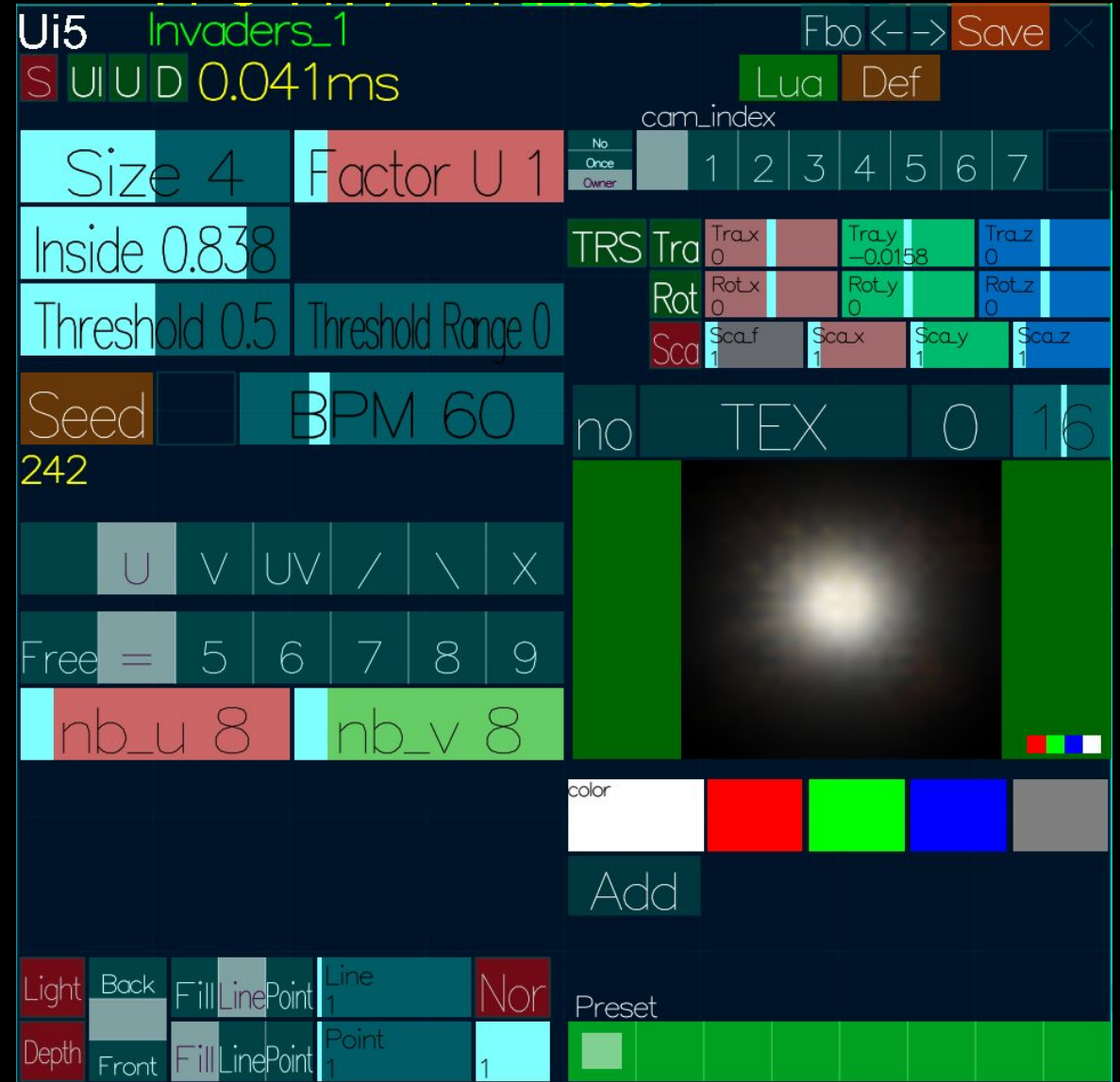


- slider value is the alpha of the MU / MEU
 - Click on slider → StarMenu Slider but also MU
 - Click on icon → move
 - Alt Click → move/resize
- State and Position of the MU control the rendering order
 - Slider value more than 0 → On
 - vertical first: **bottom to top**
 - then horizontal: **left to 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 infact BU too: BU_MEU
- Drawing change with distance
speed optimisation



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 **Focus**
- 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** (top left in white or green if current)
MEU_name made of **type** (left) and **instance** (right):
- **S UI U D** **buttons** (left bottom)
switches to activate/deactivate
Send update_UI Update and Draw
- **0.032ms** **Execution time** (next right) in millisecond
- **Base More** **Tab** (middle) ius a SELECTOR
switch between different block of **UI**
- **X** Close button (top right) close the **MEU**

MEU Bar



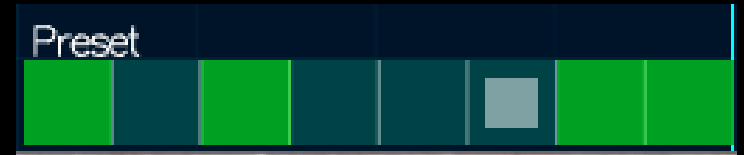
- **Lua** Open the **lua** script that the MEU use in an associated text editor
- **Load** Load only the MEU state
- **Save** Save only the MEU state
- **Def** Trigger a **Definition**, in fact a redefinition of the MEU interface
- **Both** Trigger a **Definition** and a **Load**
- **Fbo** Open the used **Fbo** (more soon)\
in the previous **BU_MEU**
- **<- ->** 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**

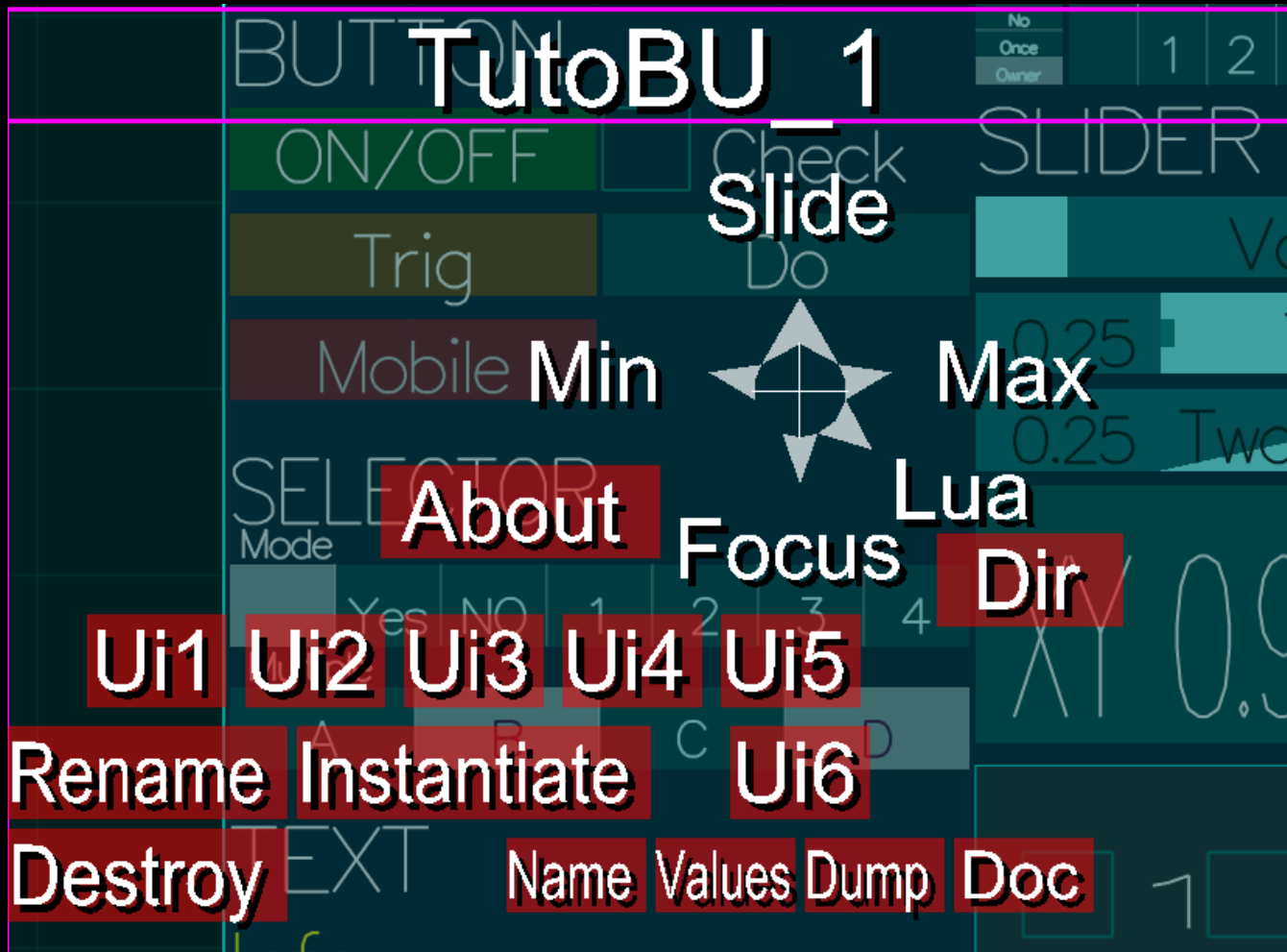


- Fixed number by MEU Type
defined in the code for now (2025 April)

Preset							
			4			8	12
		16			20		24

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

MEU StarMenu



Slide

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

Keep **Type Name**

Destroy

Confirm

Instantiate

Duplicate

Keep **Type Name**

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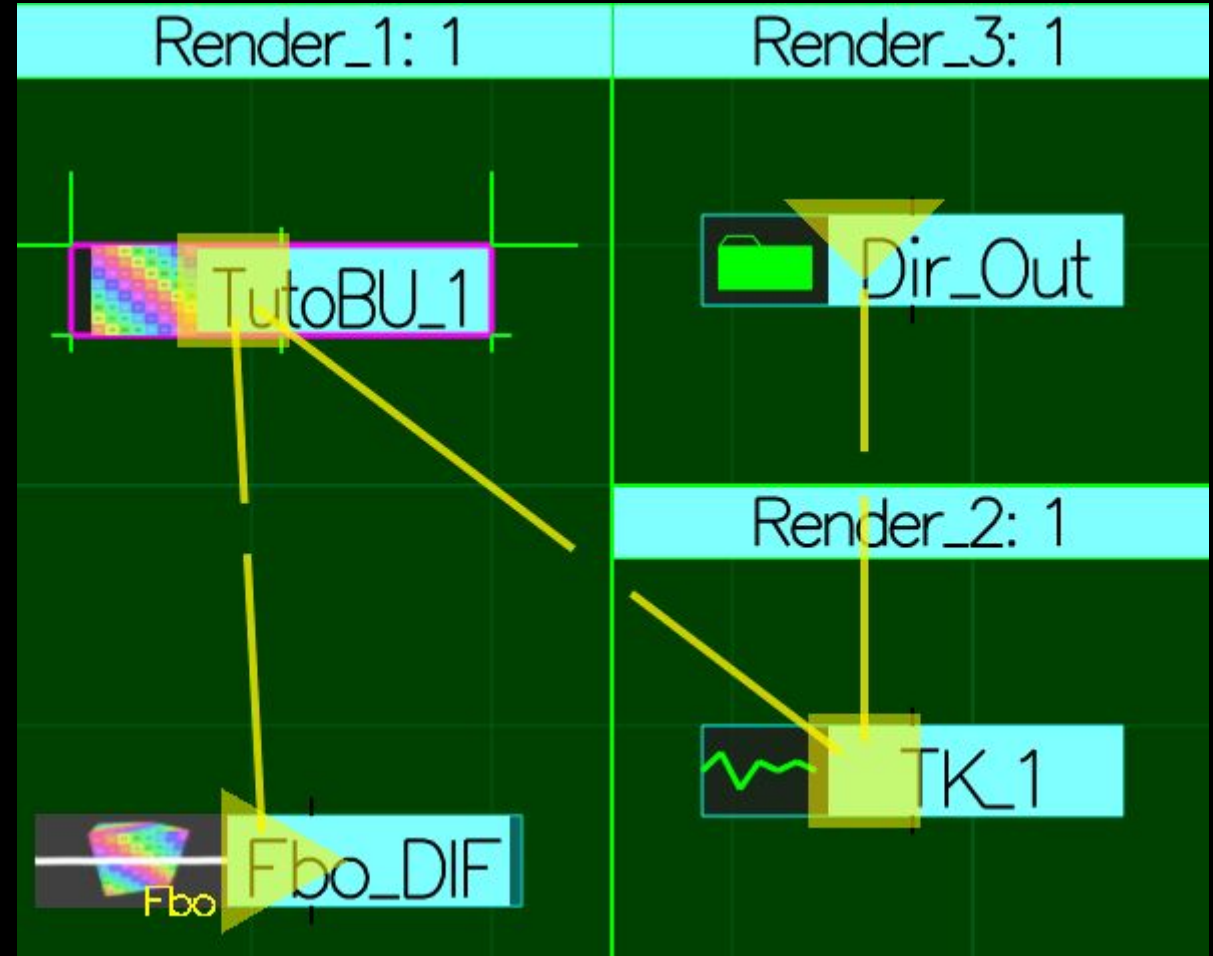
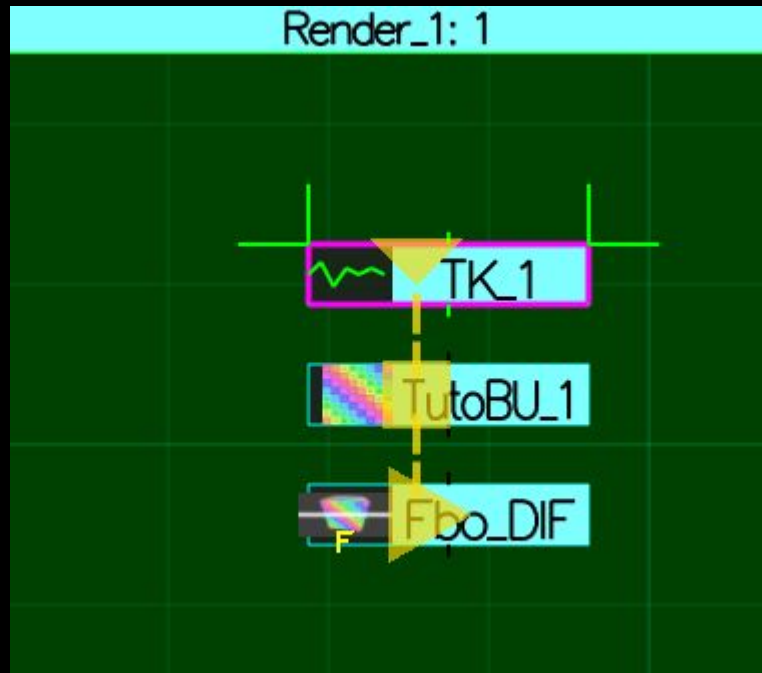
An introduction

Part 7: Rendering chain

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

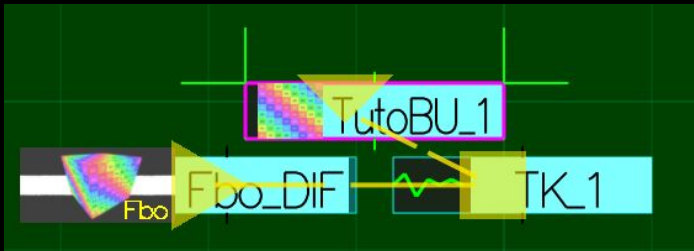
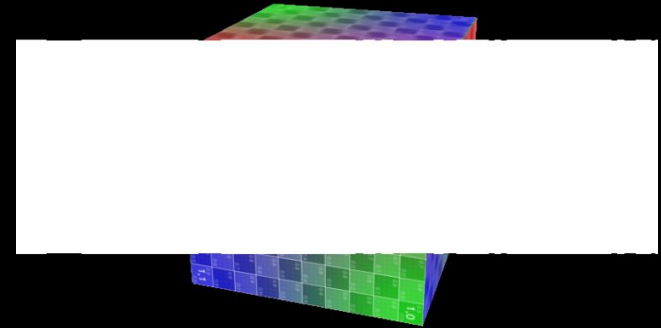
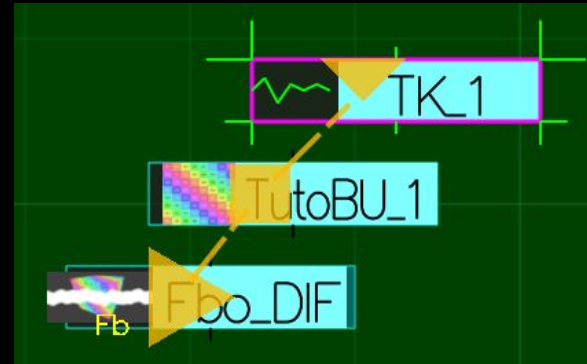
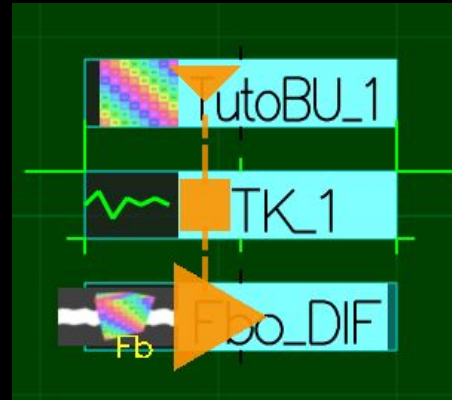
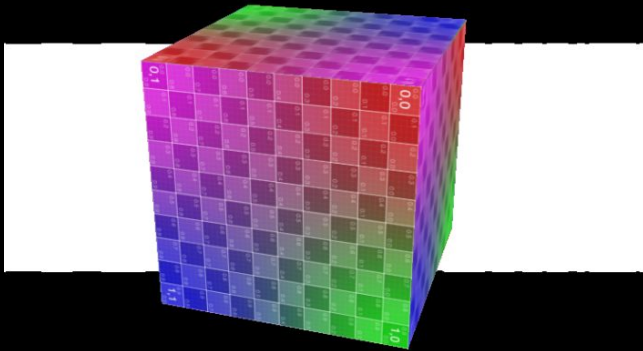


Rendering Chain and BU_RECT



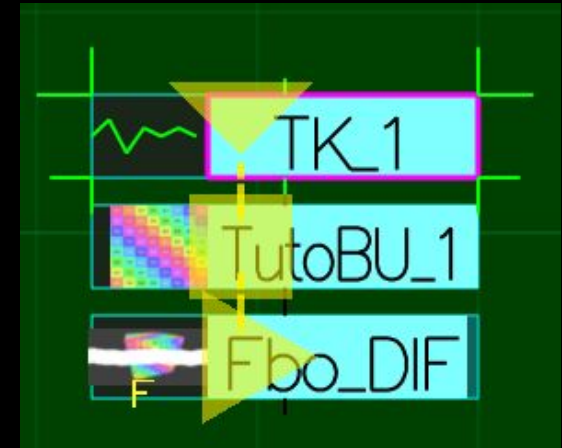
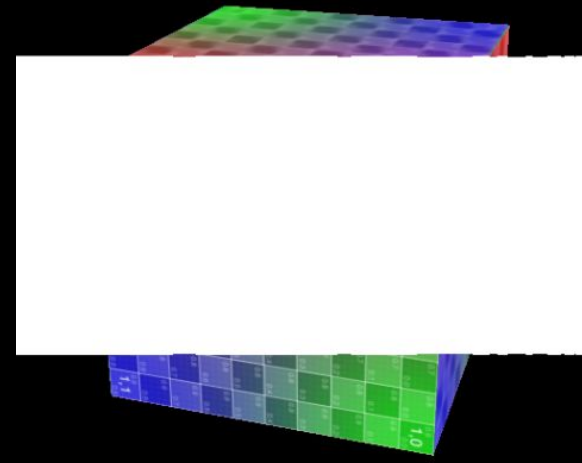
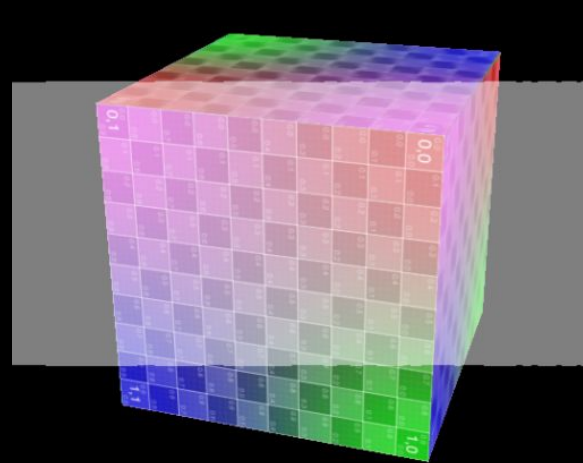
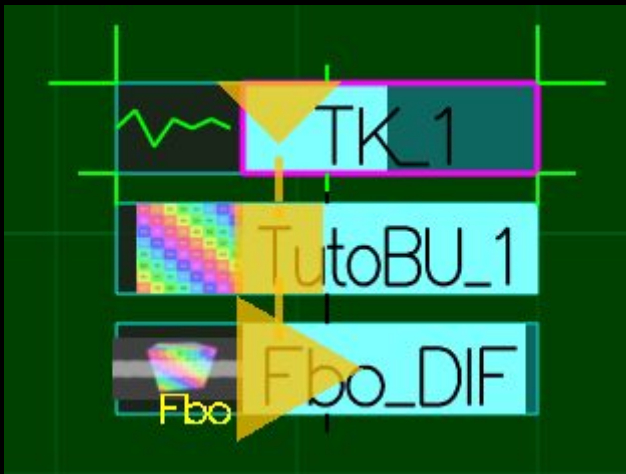
Rendering chain

- **State and Position** of the **MUs** control the **rendering** (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

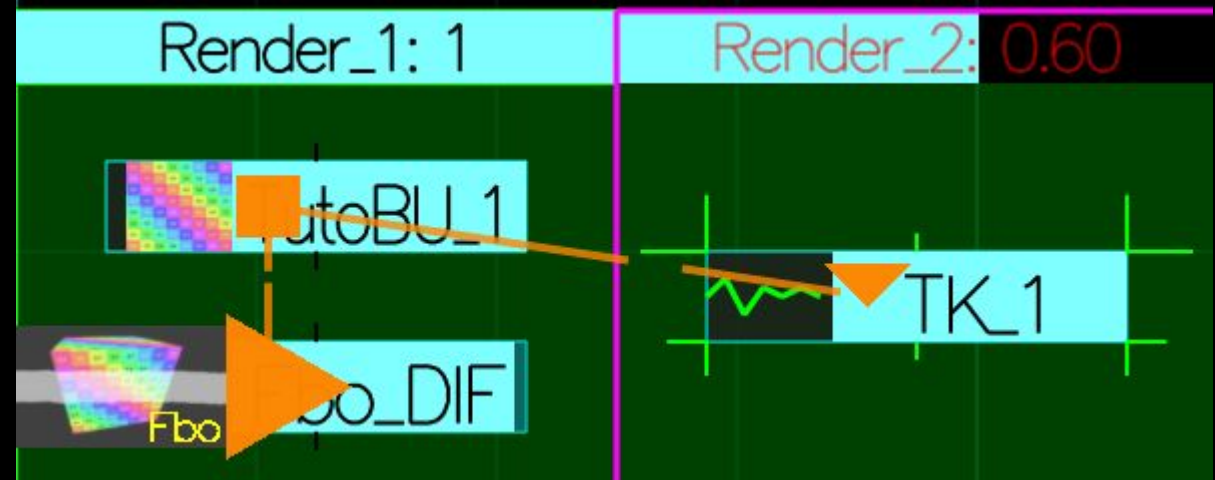
- **First**
 - **Order of the BU_RECTs**
 - **Number in Name**
 - **Change**
 - **StarMenu**
 - **Keyboard**
 - **Ctrl Up / Down**
- **Second**
 - **Order in the BU_RECT**
 - **Bottom to top**
 - **Left to Right**



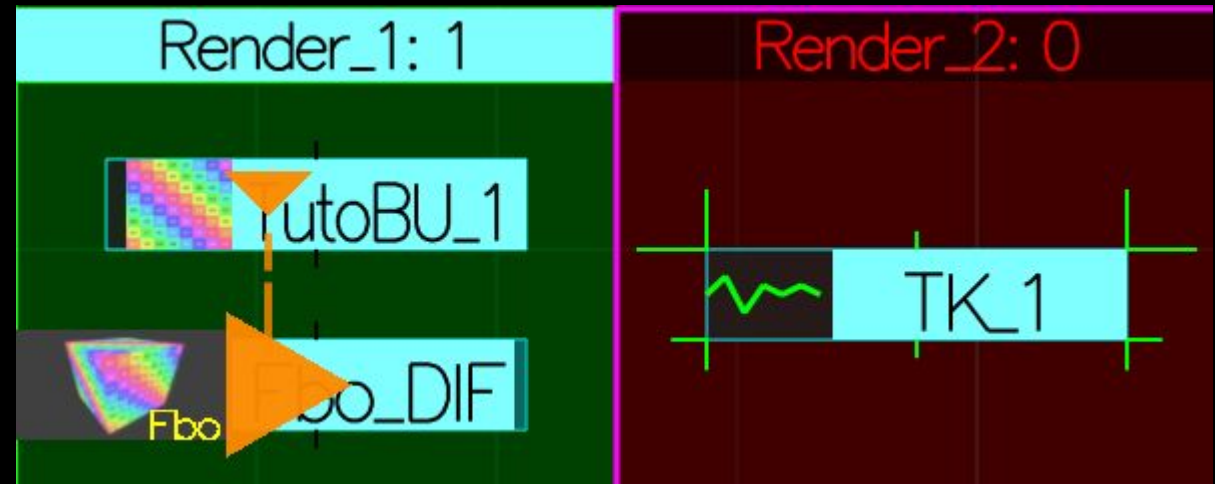
Rendering Chain BU_RECT

BU_RECT value

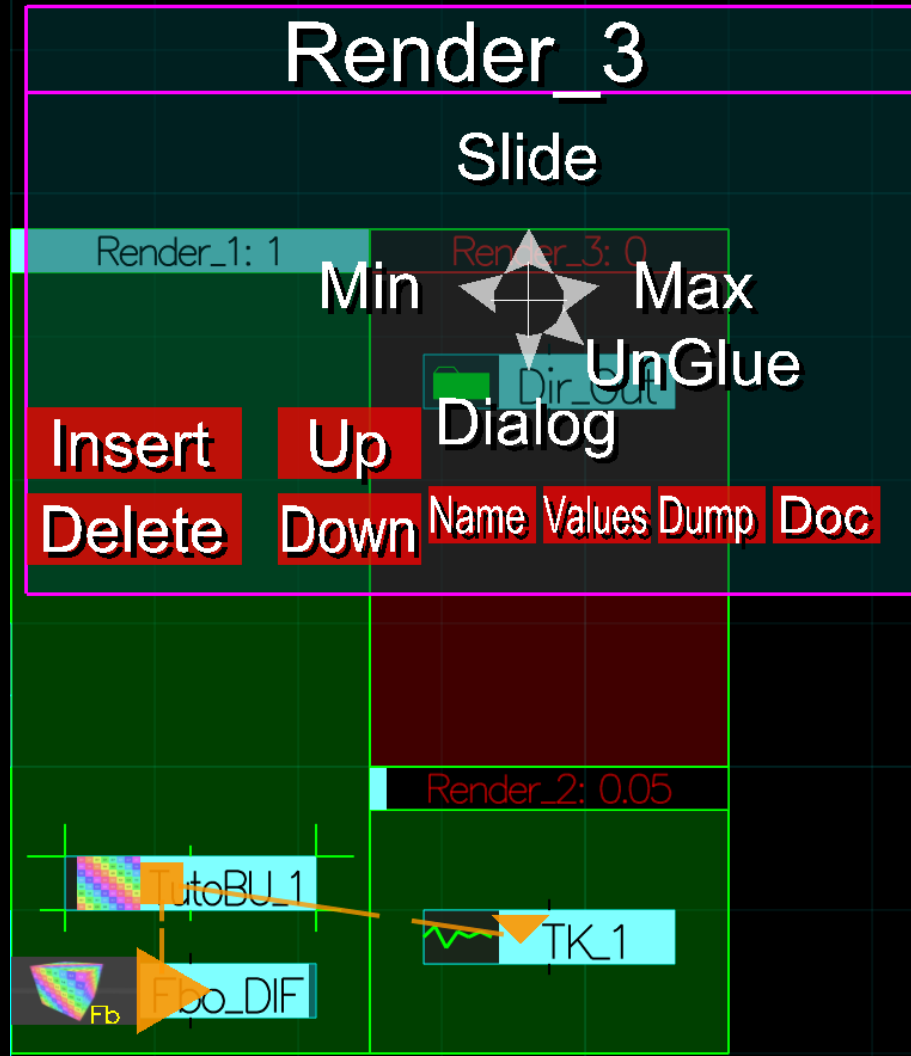
- multiply MU Value



- 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

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Part 8:

MEU more

- MEU Seen MEU search
- MEU_DIR
- Cameras
- Axes
- Flatland

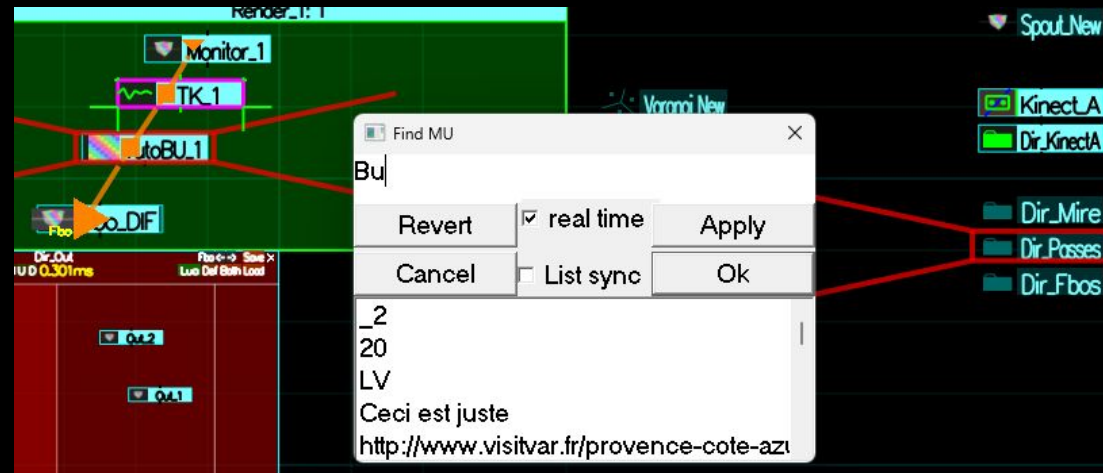


MU Seen MEU Search

- 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**
- Show a mark



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



MEU Cameras

cam_index								
No		1	2	3	4	5	6	7
Once								
Owner								

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

- Camera selector
- Button **Axe show**

cam_index								
No		1	2	3	4	5	6	7
Once								
Owner								

- Reminder: StarMenu → name

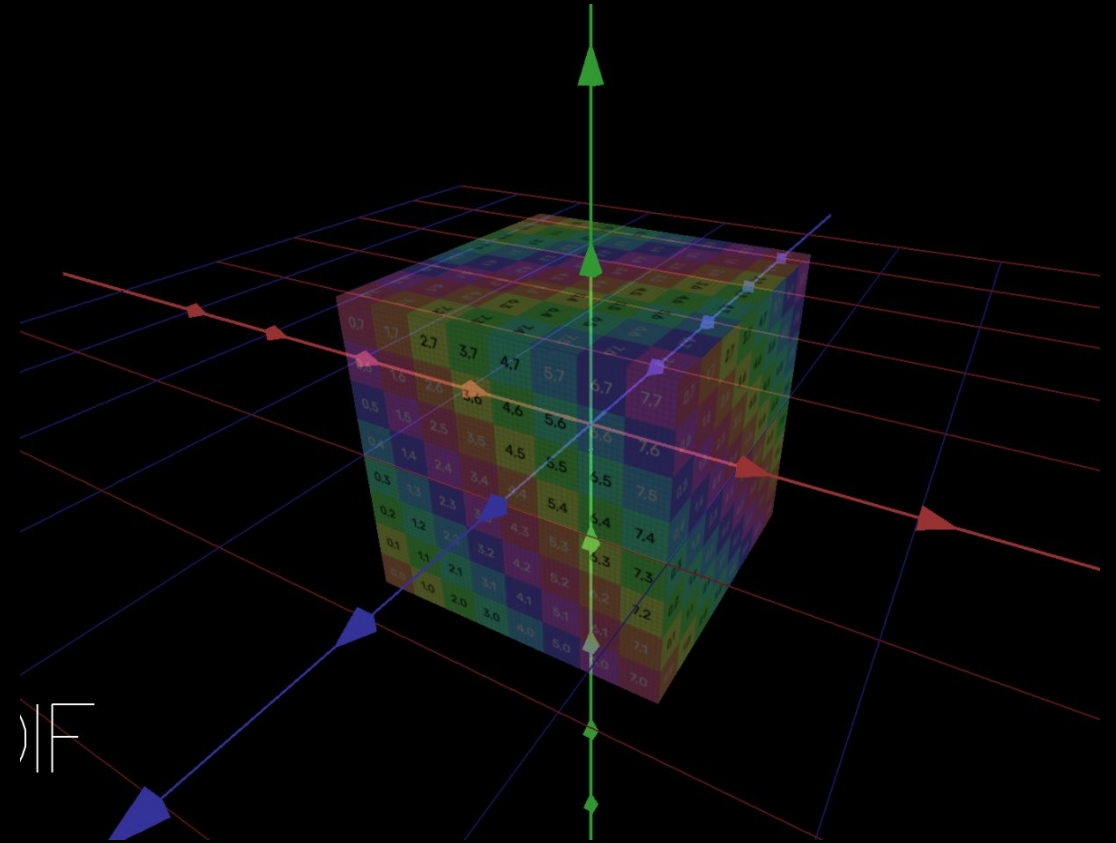
Camera Selector



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

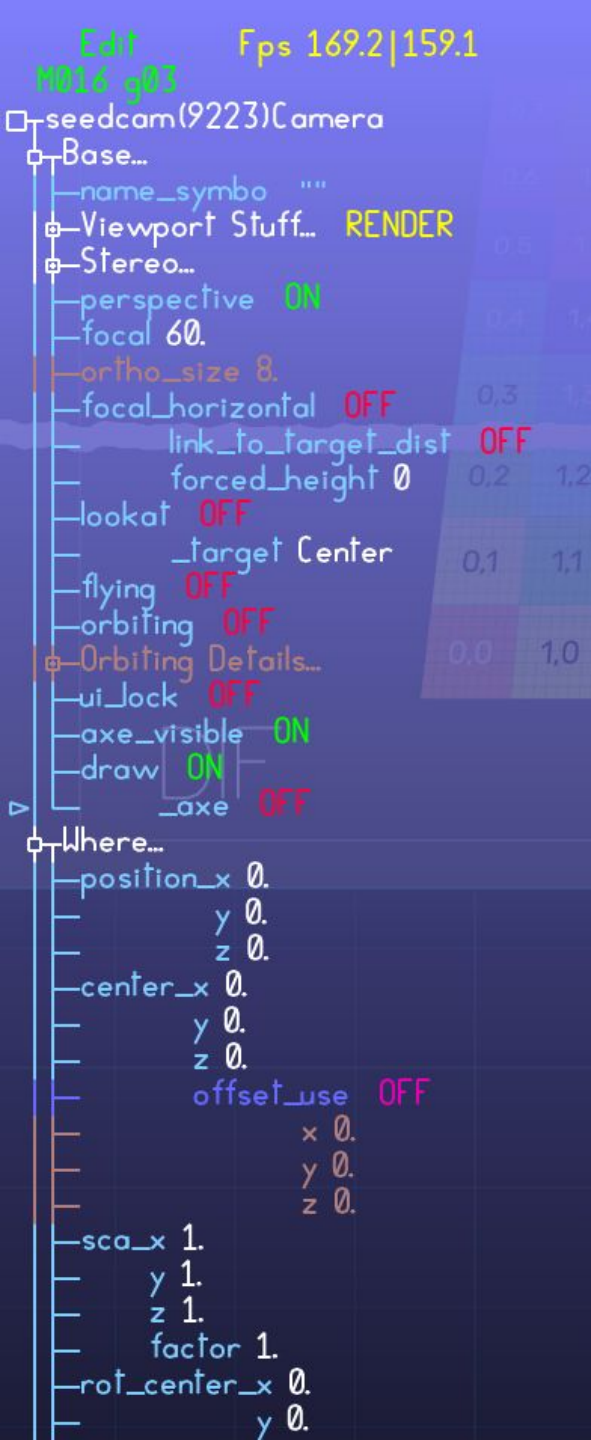
Camera Axes Units

- **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:** Mathematic not physics
 - Back of the pyramid aligned with unit



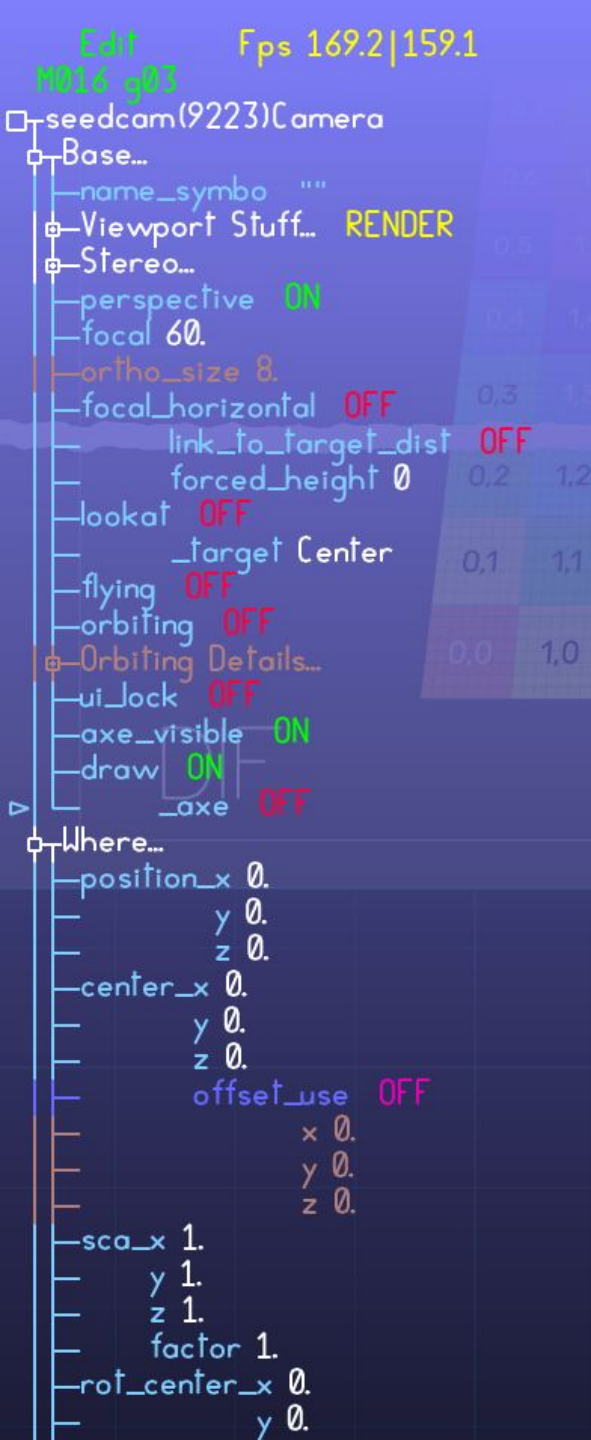
Camera Edit

- **Middle Click → Start Editing**
 - BU_CAM will manifest if locked
 - BU_CAM locked
 - Camera 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**



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**



FlatLand Params

Short for **parameter**

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

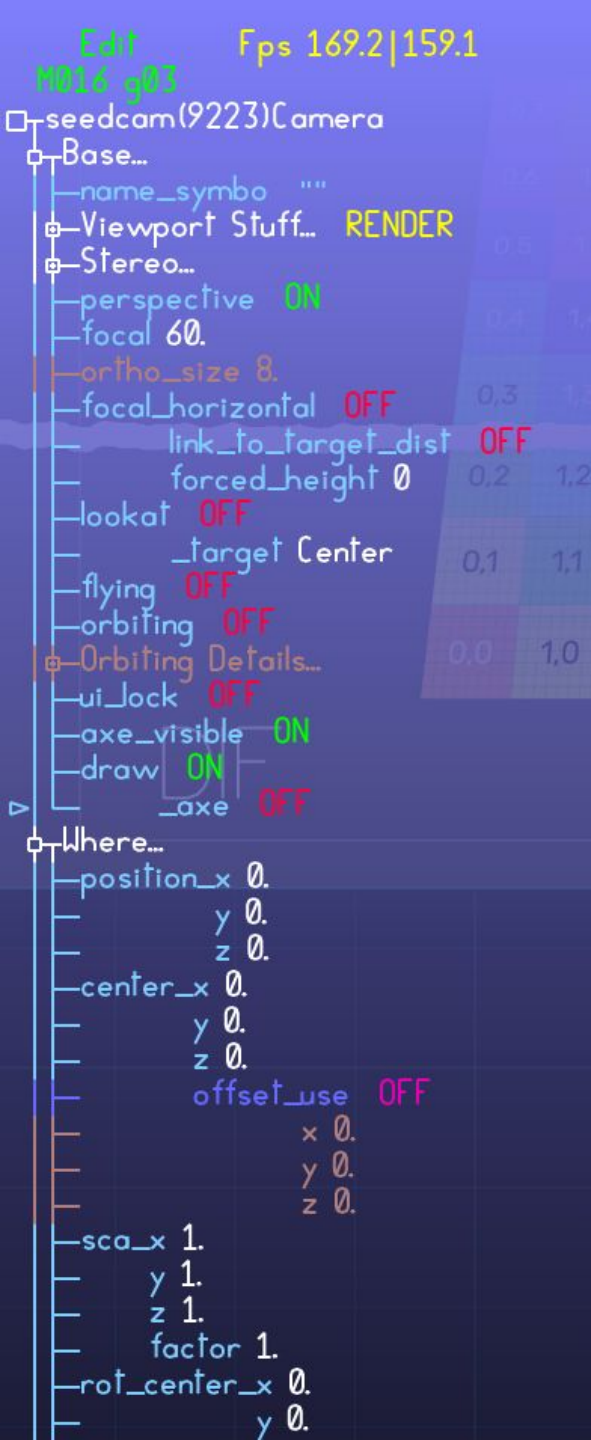
Param draw :

- 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



FlatLand Param edit

Mouse

- Bool
 - param_trig Drag left and Right
 - Just touch it
- Integer,Float
 - unlimited Click and turn around
 - 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

AAASeed

An introduction

Part 9: Walking

- Create New APP
- Bank of Binds
- BU_TEXTURE
- Frame Buffer Object
- MEU Fbo
- Meu Monitor
- Create MEU
- Import MEU
- MEU Video
- MEU PIP
- MEU Out
- MEU Trax

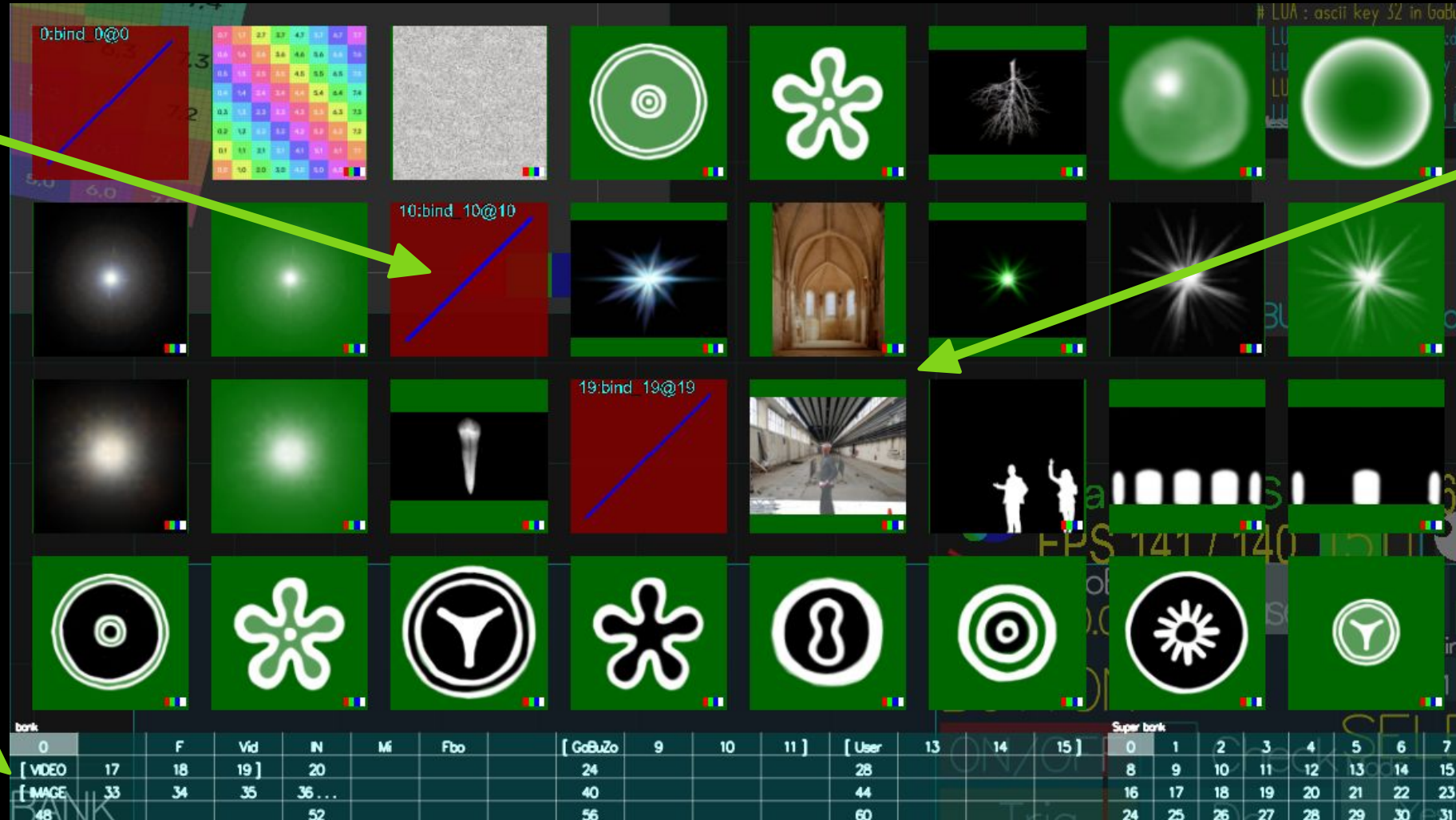


APP: Create a new one by folder duplication

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

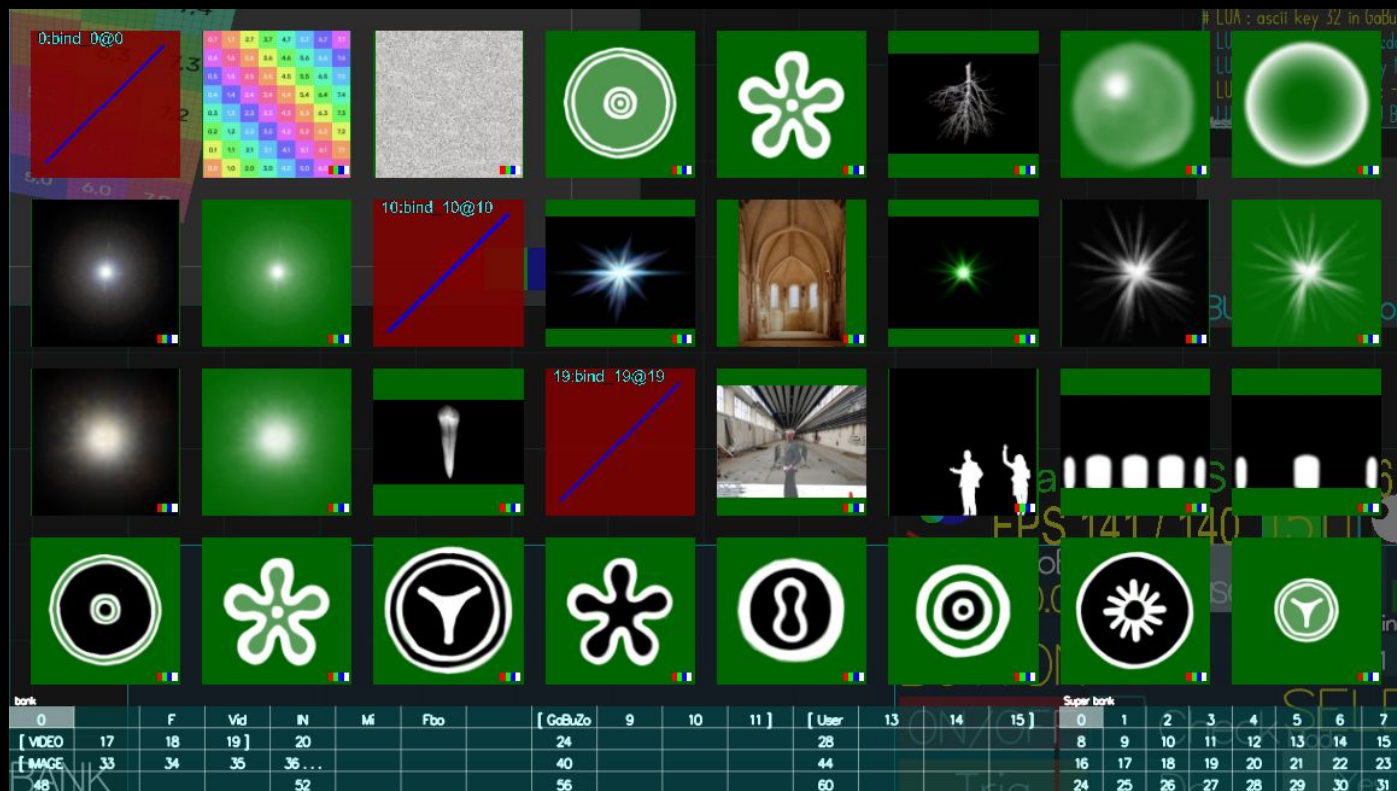
Bank of Bind: 2048 Banks of 32 Binds → 65 536 Slots

- Bind for
no
texture
- Slow
blinking
redish
- Blue
diagonal
- Banks



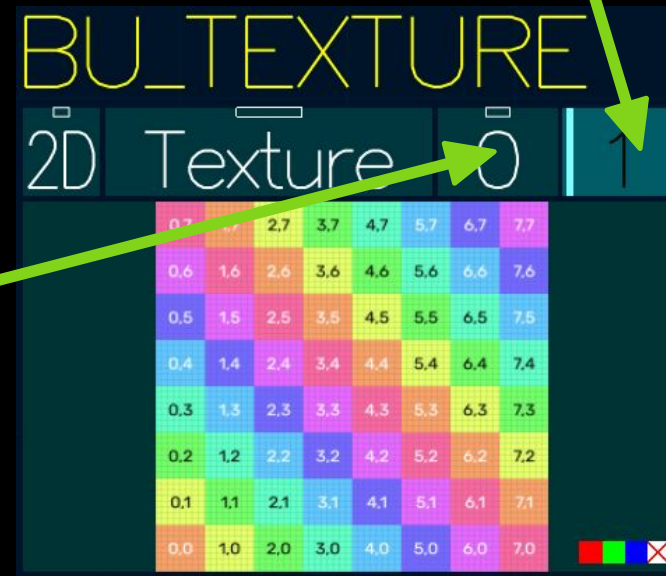
- Binds
- Monitors
- Click Double
Open monitor
- Super banks
→ 64 banks

Bank of Bind: BU_TEXTURE



Bank

Bind



BU_TEXTURE

Texture dim	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	ren	GodRays	ToneMap	Fxaa			

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

bind

bank

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

Click Double To Load

Texture_bank															✕
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**

it is as **where we draw**

it regroups textures (image) of the same size

- **Color attachments**, up to 4 in AAASeed
- **Depth** attachment (**zBuffer**)
- **Stencil** attachment, exist but **ignore**

- **Exposed in GaBuZoMeu**

MEU_Fbo

Special MU display

Fbo flashing

Icon changing size



Fbo / Frame Buffer Object

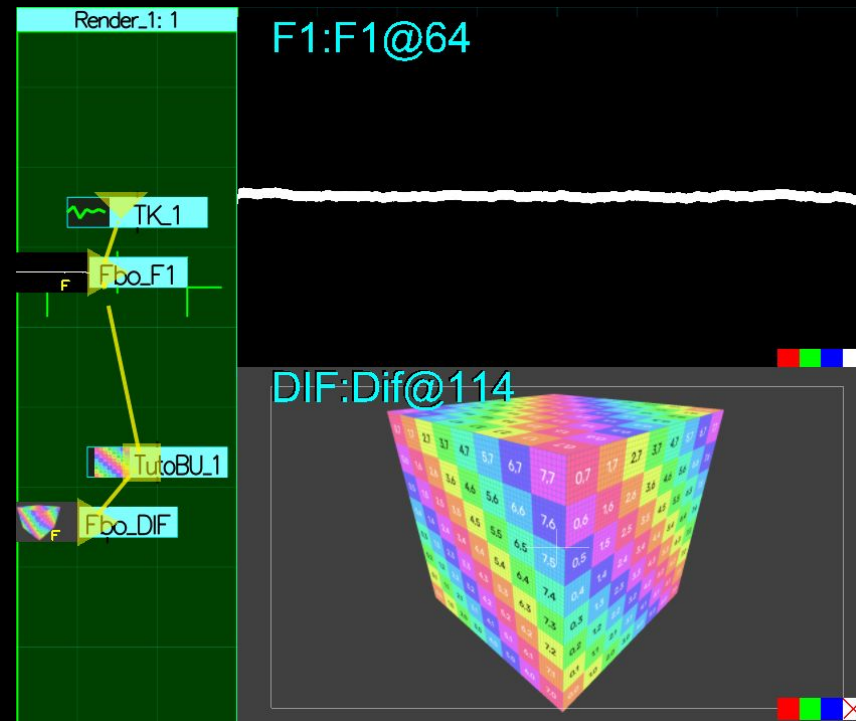
- No Fbo

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 0.066ms Main Copy 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 Fp16 Fp32

Attachment 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

Attachment On Cpu

1 2 3 4 Depth

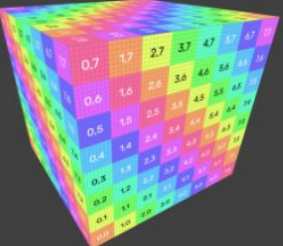
Attachment to save

1 2 3 4 Depth

Save trig Save

Preset

2 4 6 8



- **Size** Size / * Swap
- **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

- **Attachements**
 - Selection
 - Cpu : transfert from Gpu to Cpu
 - Monitor
 - Active
 - Click Double
 - Save Trig → One frame
 - Save → Each frame

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

1920 x 1080

Size X 1920 Size Y 1080

Size / * Swap

4 x Int8

1 2 3 4

8 16 Fp16 Fp32

Attachment active

1 2 3 4 Depth

Erase Custom

Erase Color

Custom 0 25 50 75 100

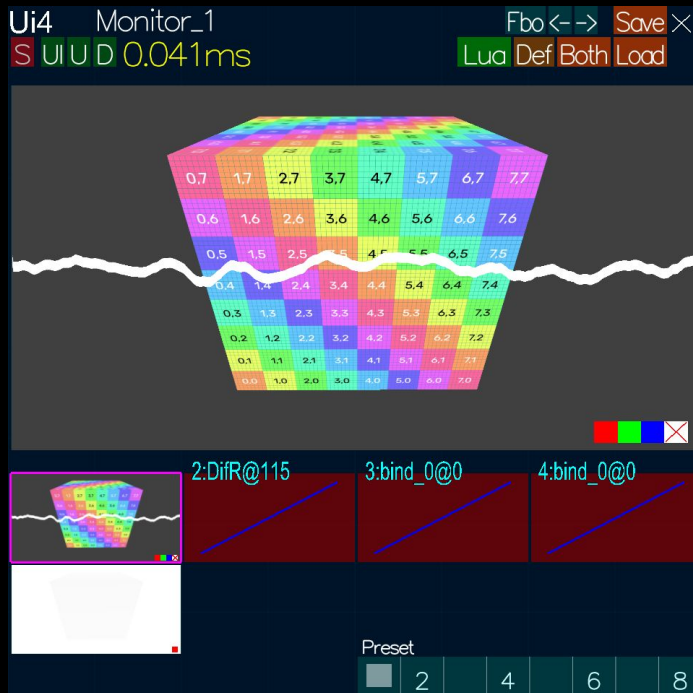
R G B Cy Ye Ma

trail 6.046

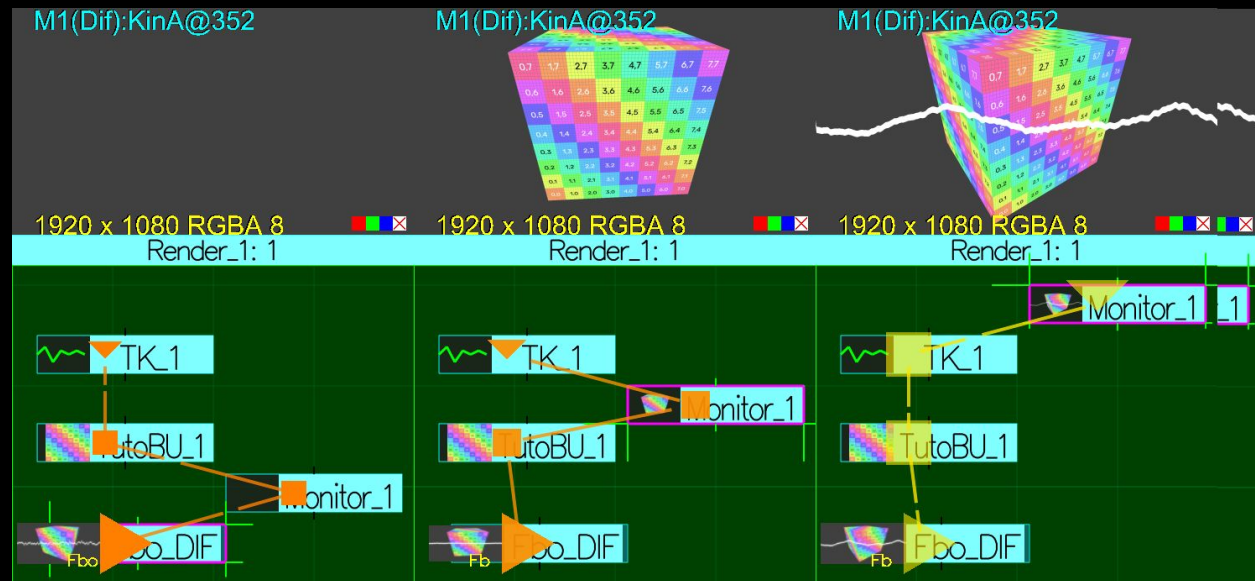
Clear

Color Depth Stencil

MEU Monitor



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



- **Meu**

Show all attachements

Select monitor attachement

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

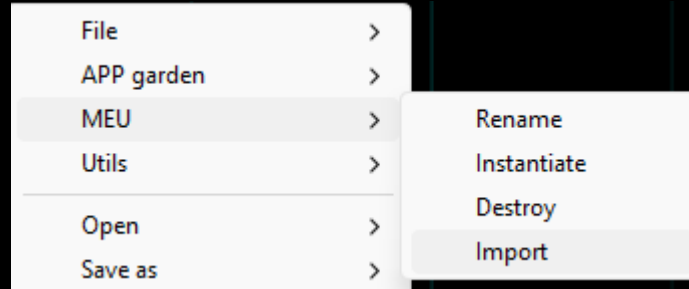
MEU nb 103/121

Tag	MEU Item	MEU Item	MEU Item	MEU Item
2054	AAAUtills	App	BlobDetect	
Blur	Boid	Bullet	Cam	
CaptureRect	Clear	Clous	CIPool	
ColorCurve	DepthPick	Derviche	DigitalProjection	
Dir	Displace	DisplaceCV	DisplacePart	
DistField	ExShaderGrid	ExShaderInstance	FaceTrak	
FaceUV	Fbx	FbxMatte	FieldGene	
Flex	FlexVideo	FP	Grab	
GridSel	Hexa	HexCraze	imgAnal	
ImgSend	Invaders	Kinect	Kinect1	
KinFlipper	KinMove	KinMoveAuto	Lidar	
LightPassV1	Lights	Marseille	Materials	
MeshStatic	Mondrian	Monitor	MuBegin	
MuEnd	NdcAddBlur	NdcBloom	NdcBranching	

Use BU

Meu Window: Import MEU

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



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
	24

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
	24

- 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

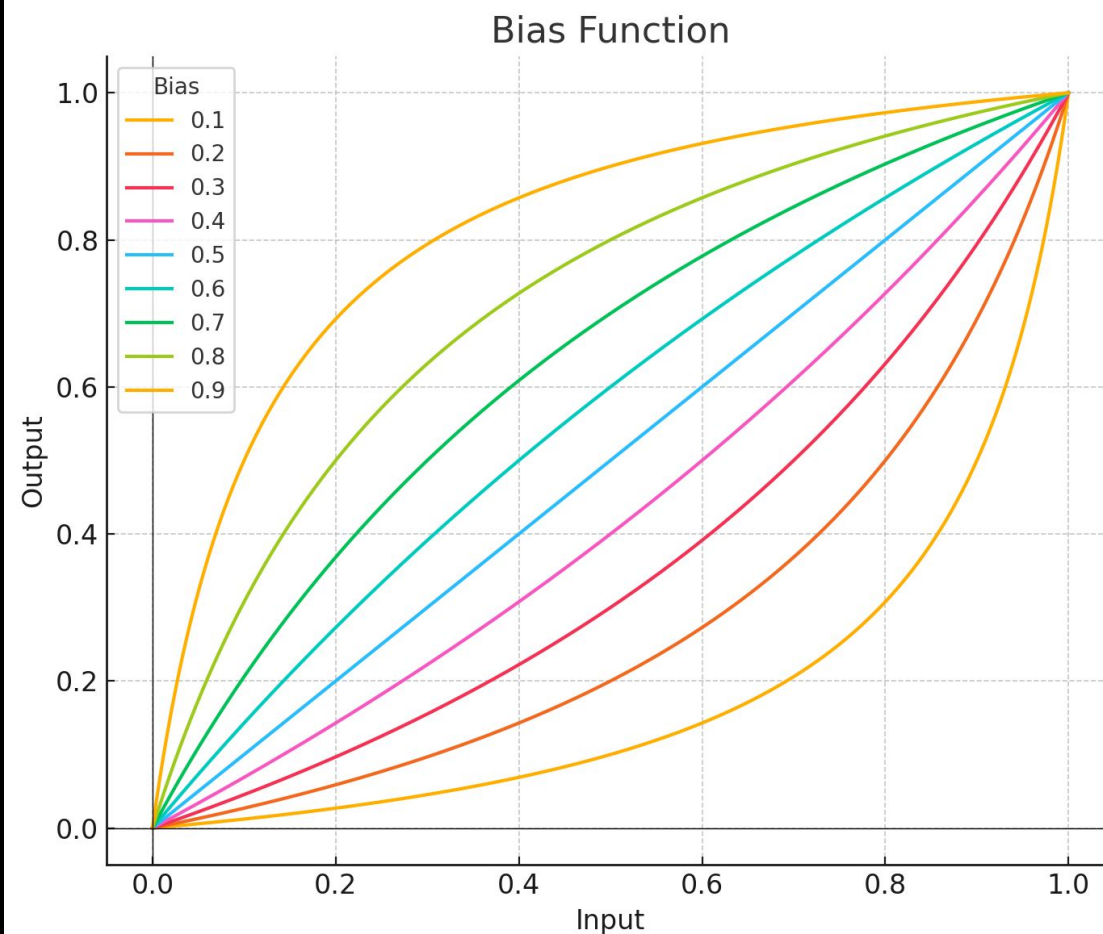
Incrust Inv

0.117 Levels 0.238

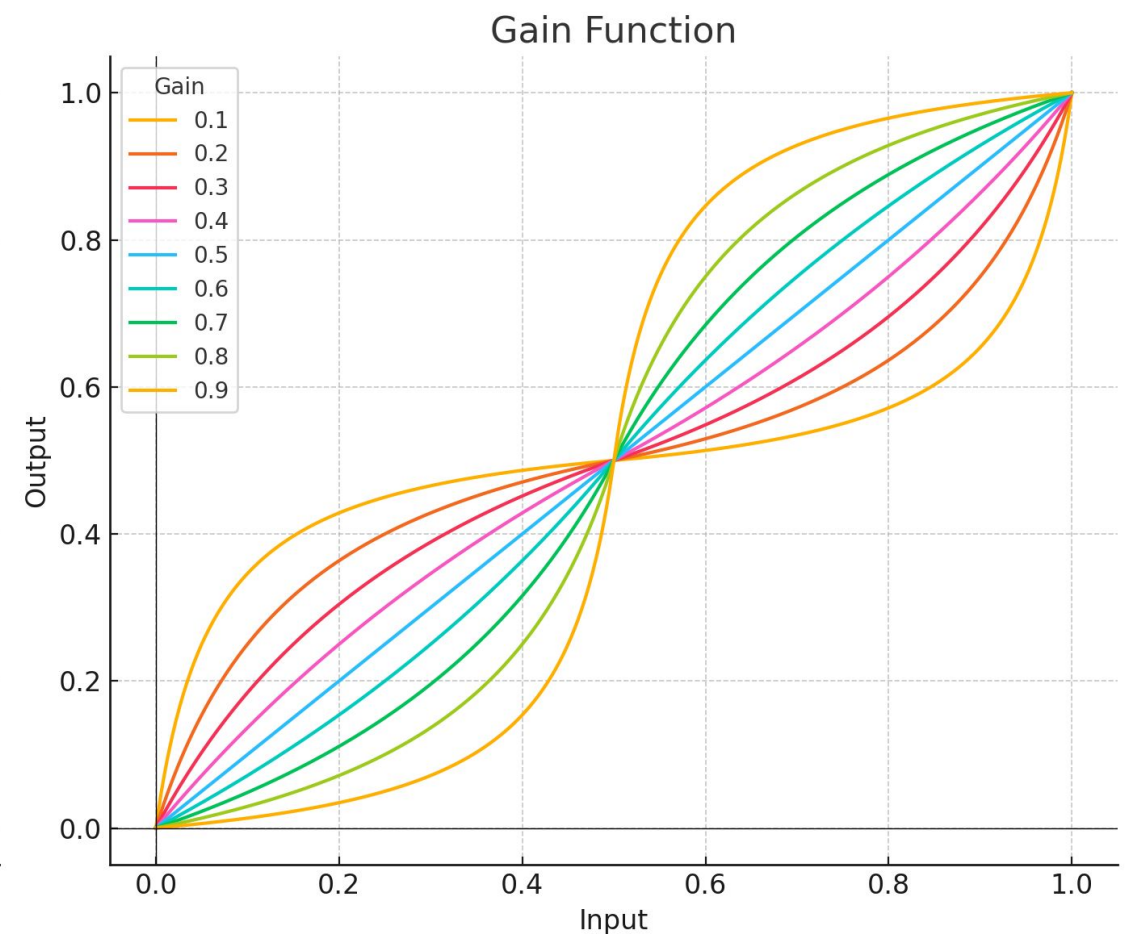
Gain 0.35 Bias 0.5

Cpu Gpu

Gain Bias an electronic heritage

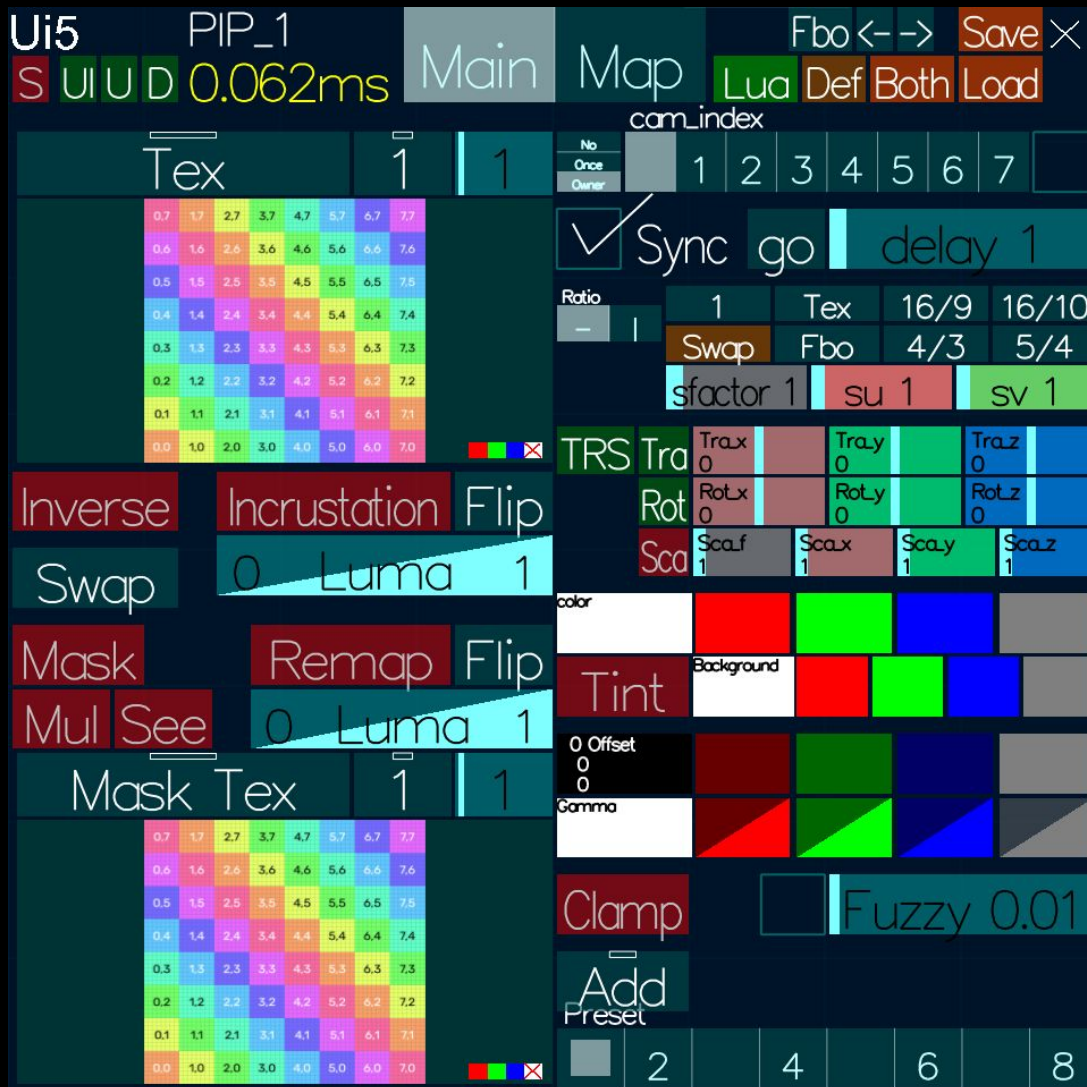


- **Input at 0.5 : Bias value**
- **Low Bias → Push values down**
- **High Bias → Push values up**



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

MEU PIP (Picture In Picture): Main



- **Display a Texture and handle smooth transition**
Tex : Next Texture
- **Luma (Luminance) Incrustation**
Incrustation Flip
0 Luma 1
- **Swap: Exchange texture and Mask**
- **Mask**
Remap: like incrustation
How Grey map to alpha
Remap Flip
0 Luma 1
 - Flip : Inverse the remap
 - Mul : Multiply luma by the mask
 - See : show only the mask
- **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

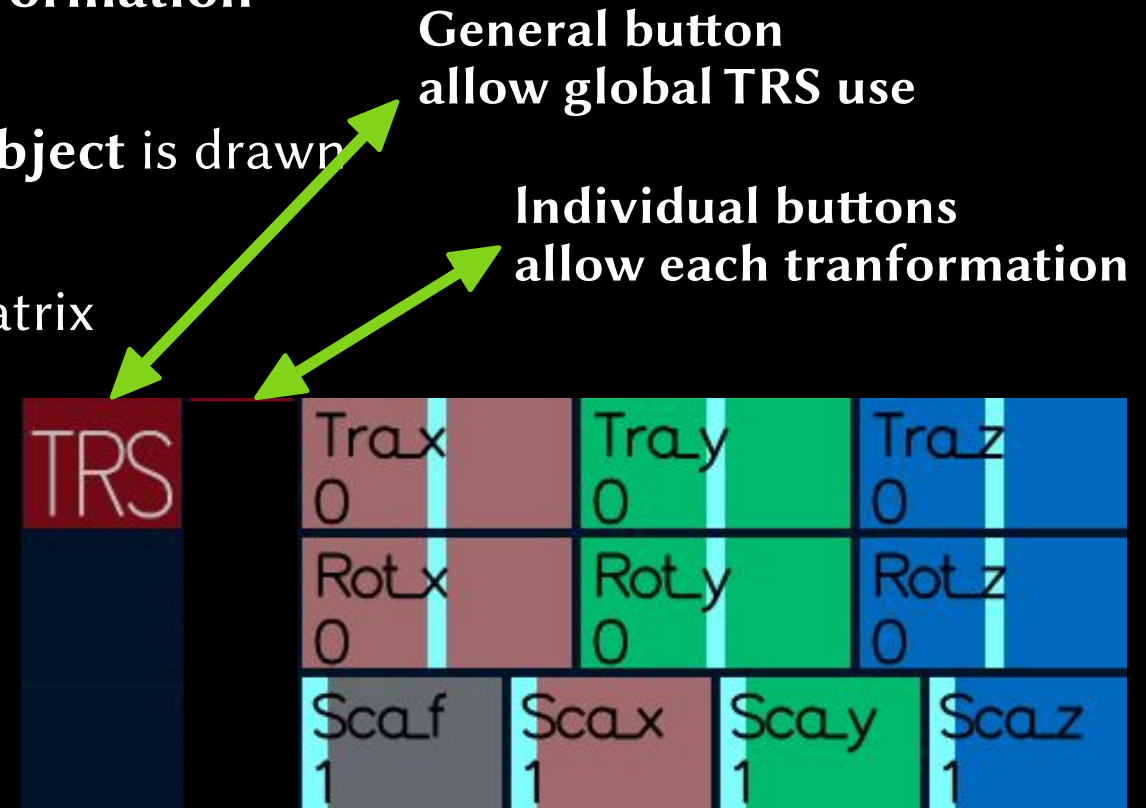


Size Factor:
size in both direction

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**



MEU PIP : Map

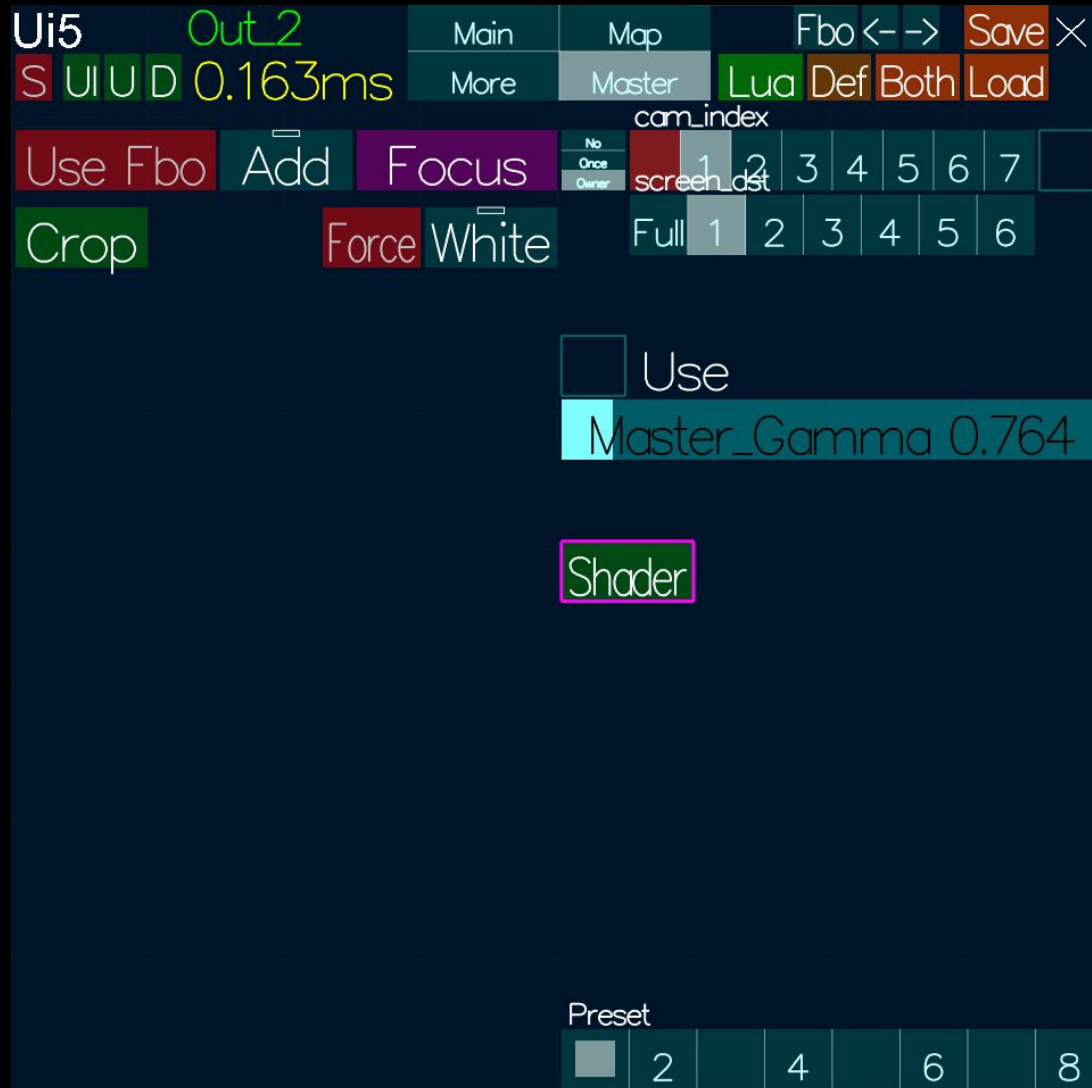


- nb_u, nb_v : number
- U Min Max, V Min Max : stretch the texture
- hexa :
- top_line :
- du, dv :
- offsets :

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			

MEU Out: Display an Image in Ouput



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

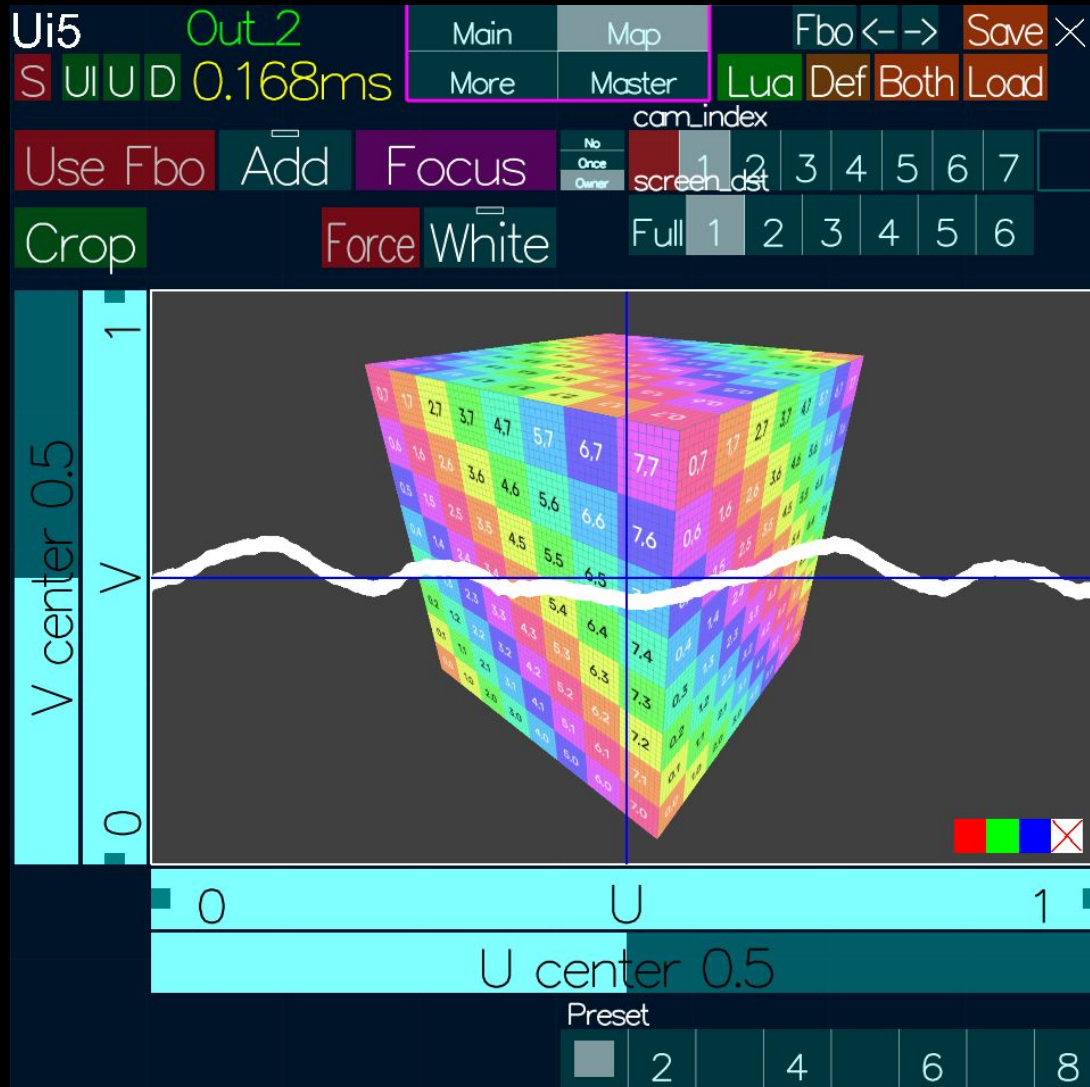
Gamma 1 SetGet SetGet Gamma 1
0 LR 1
0 BT 1
Gamma 1 SetGet SetGet Gamma 0
1 2 3 4 1 2 3 4

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



Rendering

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

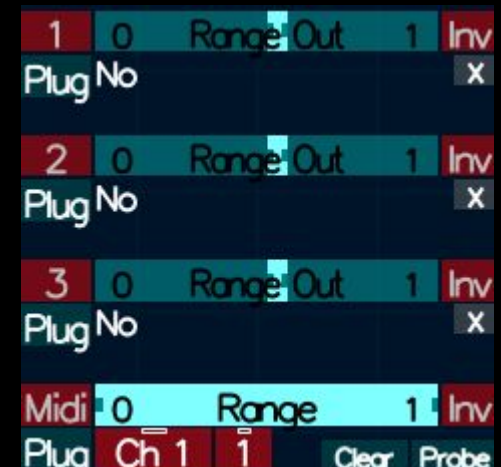
MEU TRAX



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



- Out setting



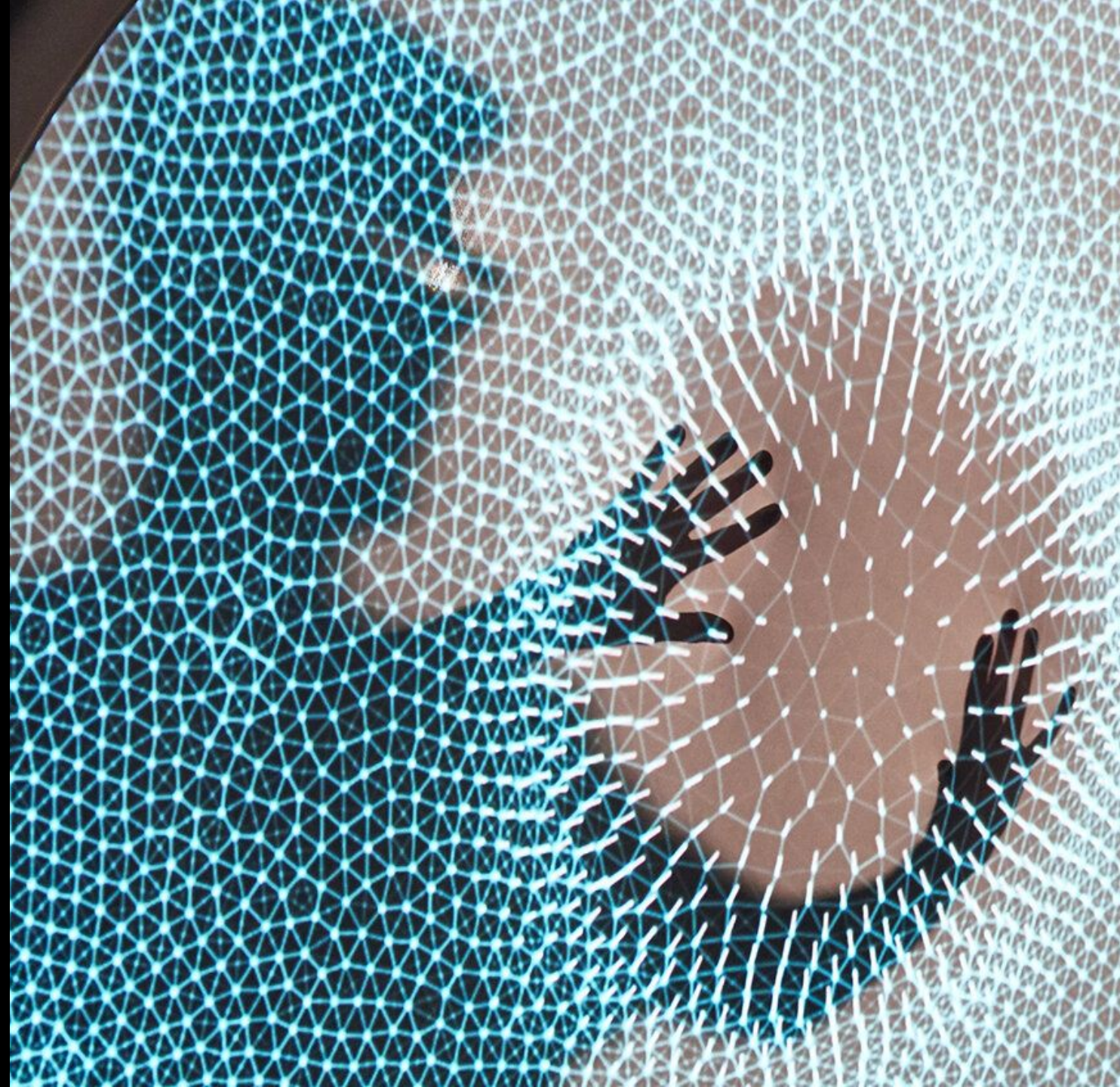
RUN Duration

AAASeed

An introduction

Part 10: Fun

- MEU TK
-
-
-
-

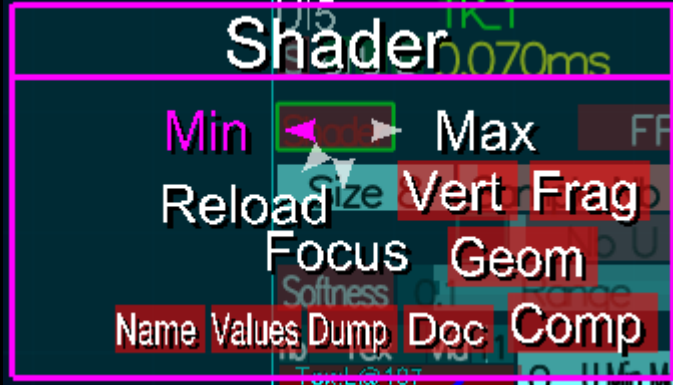


MEU TK

Ui5		TK_1		Fbo <- ->		Save X	
S UIUD		0.140ms		Lua Def Both Load			
Shader		FFT		cam_index			
				1 2 3 4 5 6 7			
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				No Average Max Decay Inter			
Tex:L@107		0 U Min Max 1		Interval 16		Strobe 0	
		0 V Min Max 1		Sym Thickness 0.126		Force 0	
Add				0 Radius 1		Turn 1	
color				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		Nor		Freset			
Depth Front Fill LinePoint		1		4		8	
				12		16	

Shader StarMenu

Shader



- Min/Max : Off/On
- open the shader code
 - Vertex
 - Geometry
 - Fragment
 - Compute
- reload : reload the shaders used

Doc Window

- Documentation
- Lua inspector

Info

Show

Private

All

Public

Global

GaBu Classes

Ui4

Doc

AAACAM	APP	APP_FACTORY	APP_GP
BALUE	BDD_CLEAR_SCREEN	BDD_FBX	BIND_TEX
BLOB	BLOBS	BOID	BU
BU_ALIVE	BU_BLOB	BU_CAM	BU_COLOR
BU_CREATE_MEU	BU_DOC	BU_EYE	BU_FPS
BU_KEY	BU_LIST	BU_MAAEB	BU_MEMORY
BU_MENU	BU_MESS	BU_MEU	BU_MONITOR
BU_OBJ	BU_PB	BU_POWER	BU_RECT
BU_SEND	BU_SHADING	BU_SHOW	BU_TEXT
BU_TEXTURE	BU_VIZ	BU_WATCH	BU_WINDOW
BU_WINDOW_LIST	BU_WWW	BUI	BUP
BUS	BUS_CTX	BUSS	BUTTON
CALAGE	CELT	CHANGER	CHANGERS
COLOR_REF	CREATURE	DATAGRID	EVENT

Use

Add

BU

LUA : BU_DOC | Doc : BU_Hip_full_page_and_mini | y : 4047473110784788

LUA : Mouse grabbed

LUA : BU_DOC | Doc : will be current bu now

LUA : Mouse grabbed

LUA : BU_DOC | Doc : BU_Hip_full_page_and_mini | y : 4016492750041935

Scroller

Lua example

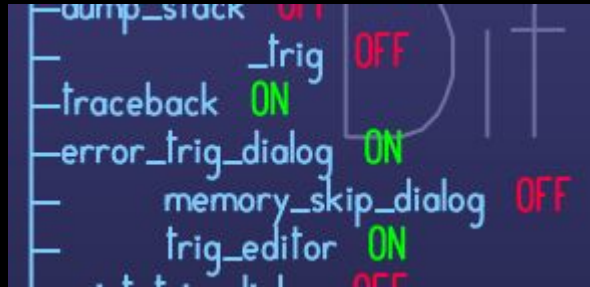


- Example of drawing with lua using OpenGL directly
- The concept looks like processing

iterative process

How to deal with errors

Flatland / Pref(F10)/ Master / lua / error_trig_editor



MEU MuBegin / End

- Use for multipass at first
- Make loops
- Camera



- Q&A for users and artists
- Shaders
- Scripting

File system Raw Approach

- AAADoc
 - lua_aaaseed_draw.lua
 - lua_aaaseed_interface.lua
- AAACore
 - wher developer working on the core works
- Visual code workspace
- AAAUser
 - Duplicate folder
 - Rename it
 - Rename User
- APP
 - Create a New App just for you
 - Duplicate an existing one
 - Quick navigation in it

AAASeed Slides

Topics to add

- Libs used
- CPU | GPU
 - transfert GPU
 - transfert CPU
- Lights
- Shadows
 - Gbuffer / Multipass