PAREIDOLIUM

BY RAFAEL LOZANO-HEMMER



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GENERAL IMPORTANT INFORMATION

This short section must be read for proper operation.

PAREIDOLIUM (2018)

BY RAFAEL LOZANO-HEMMER

Technique

Ultrasonic atomizers, aluminium and polypropylene basin, custom electronics, computer, water, cameras, display.

Description

Pareidolium is a low, circular fountain that creates portraits of onlookers in mid-air with clouds of vapour that ascend from the water basin. The fountain uses 544 computer-controlled ultrasonic atomizers, placed under the reflecting water pool, which produce the plumes of cold vapour. As a visitor looks into the water, a facial-detection system extracts their image and creates an ephemeral likeness. The portrait becomes tangible, almost breathable, only briefly, then disappears in turbulence. A display shows slow-motion images of the past 9 participants, capturing the fleeting moment of vapour portraiture.

Operation

Please refer to <u>APPENDIX I - Installation</u> for detailed system information and wiring diagram. For each tank:

- 1. Check the water levels: The water level of the tank should be at the green level of the included indicator at all times. The atomizers are very sensitive to how much water is in the tank. If needed, fill the tank to the green level, use **COLD** water, and **NEVER** use distilled water.
- 2. Plug in 4 labelled power plugs, located in the back of the tank. Each plug powers a different section of the tank.
- 3. If necessary, use the remote to turn the monitor ON.
- 4. Press the power button on the Mac Mini to turn the computer ON. The software should start up on its own after two minutes.
- 5. To shutdown the artwork off, a simple press on the computer's power button for a maximum of one second. This should launch a proper computer and artwork shutdown.

*** The computer could be set with power options in the Operating System to automate the turn On/Off sequences. Another technique would have the monitor's operating hours scheduled automatically ***

General Artwork Behaviours

As viewers approach the tank, the camera captures their image and activates the atomizers accordingly, producing their image out of cold water vapor. Only one participant should interact with the piece at a time. If a monitor is present other participants' can see the past eight participants and the current face on the monitor display.

Maintenance

Visitors cannot touch the tank, the surrounding gear, or the water or vapour within the tank. The room should be properly ventilated which will prevent the vapour from changing the humidity within the room.

While the tank should not produce enough vapour spillage to create a water hazard on the floor, gallery attendants should still keep a close eye on whether there is water on the floor. If a bit of water is on the floor (from the mist of the vapour), simply dry it with a mop.

The filtration system should be inspected at the beginning of each month. If it has begun to accumulate debris or appear dirty the filters should be changed. See <u>APPENDIX VI</u> for reference photos and instructions on how to change the filters.

A manual timer is included with the piece along with the filtration system. It should be set to operate in the off hours of the piece. This will ensure that the filtration system runs when the piece is not in regular use and help to extend the life of the atomizers and keep the tank clear of debris. Pressing a specific pin on the number wheel of the timer downwards means that power will be ON at that indicated time. Pullinga pin outwards means that power is OFF at that indicated time. The timer should then be rotated until the "Time Now" arrow reflects the current real time. If power is ever cut from the timer the Time Now arrow must be adjusted again in order for the scheduler to work properly.

All the atomizers should be wet cleaned anytime after the tank is emptied or every four months. See <u>APPENDIX VI</u> for how to clean the atomizer disks.

If the sides of the tank begin to show stains from the water or other accumulated debris they can be cleaned using vinegar. If vinegar is used it must be **THOROUGHLY** rinsed off or it may cause the atomizers to fail prematurely. Refer to <u>APPENDIX VI</u> for detailed instructions.

Placement Instructions

When installing the artwork begin by placing the tank on the floor in its desired location. It should be centered in the room. For best performance of the piece the lighting in the room should be quite dim if present at all. However the lighting in the room is a curatorial decision. If light is in use the temperature must be above 4,500k. Recommended light sources are analog or high frequency LED's.

Next install the overhead camera directly over the tank, making sure that it can neatly fit the entire tank in its view. Adjust the tank and camera as needed to achieve this view.

Consult the wiring diagram for information on how to connect the camera and wires from the tank to the computer. If the computer is located more than 10 ft from the tank, use an active USB extender to ensure that either of the camera's video feeds are not dropped.

The placement of the monitor is a curatorial decision. The only constraints are that the monitor **CANNOT** be placed directly behind the tank and that the screen be between 10 inches and 45 inches on the diagonal.

Once everything is connected, fill the tank, ensure that the water level is even with the green mark on the provided water level indicator. Always use filtered water.

Test run the artwork and ensure the cameras are properly placed.

Finally set the operating hours for the manual timer included with the filtration system. It should be set to operate when the piece will not be accessible to the public. This will extend the life of the atomizers and keep the tank clear of debris.



View of the tank

DETAILED TECHNICAL INFORMATION

Normal Software Operation

This piece uses three simultaneous programs: Pareidolium, FaceTracker and VideoLooper.

The **Pareidolium** software controls the behaviour of the atomizers and the lights. The **FaceTracker** software detects and processes the capture of a face. And the **VideoLooper** software records and displays the images caught by the overhead camera on the display.

Each of these applications starts automatically when the computer is powered on. The normal operation of each piece of software is detailed below.

FaceTracker



View of the FaceTracker software functioning normally

This piece of software detects and tracks the face of the viewer as they interact with the piece. The facial image is pixelated and then sent to the Pareidolium app via OSC which maps the pixelated image to atomizers. You should always see the tracking box appear around the viewer's face when tracking is working properly.

By default this application will startup in "small" mode nested in the lower left corner of top of the VideoLooper application.

Manual adjustment of the camera should be sufficient for adjusting the focus of the face tracker, however, you may need to adjust the additional camera parameters to get a clear and accurate image depending on the installation lighting. Information on adjusting these parameters can be found in the FaceTracker subsection of "Manual Software Calibration".

Pareidolium



View of the Pareidolium software functioning normally

This piece of software should only be visible when connected to the main monitor of the computer. Its function is to take pixel data from FaceTracker and send commands to each atomizer. The state of each atomizer is also displayed here. You can control the idle behavior, atomizer timing, and tank debug settings from the application. On normal operation, none of these settings need to be adjusted. Information on adjusting these parameters can be found in the Pareidolium subsection of "Manual Software Calibration".

VideoLooper



View of the VideoLooper software functioning normally

This piece of software displays overhead images of the tank as viewers interact. It should always be visible on the installation display. On the right side It will display the nine most recently projected faces while on the left side it will display an overhead view of the artwork as well as the live facial tracking feed.

The layout and features of this display can be adjusted using the layout sliders described in the VideoLooper subsection of Manual Software Calibration. Adjustments that would change the key visual characteristics of the piece, such as the number of faces in the grid or the left/right arrangement of the views should not be changed without consulting the artist.

Manual Software Calibration

Each piece of software can be adjusted on site as needed. The section below outlines the name and function of main parameters to configure the application. Instructions to sequentially test each Atomizer via the Pareidolium app can be found in <u>APPENDIX VI</u>.

The following hotkeys apply to all three pieces of software: **g** - show and hide the GUI menu containing sliders for adjustment **esc** - quit the application

f - toggle the application to become fullscreen

FaceTracker



View of the FaceTracker software functioning normally with GUI

The following parameters can be configured for the FaceTracker application to improve the image quality for tracking viewers.

To return the application to the "small" mode used for display on top of the video looper application, check the smallMode checkbox. This will reposition and resize the application window.

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tankCan	10
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ShowFilter	
FilterScaler	0.75
FilterX	48
FilterY	377
===all_filterX	189
small_filterY	491

The table below shows all of the parameters underneath the GUI group: UVC Camera. These parameters control the digital camera settings and represent the values you are most likely to need to change. If you want to see the description of the rest of the parameters under different GUI Groups please refer to <u>APPENDIX IX: COMPLETE GUI FUNCTIONALITY</u>. Other GUI settings should not be changed without consulting Antimodular.

Name	Default Value	Value Range	Description
smallMode	TRUE	FASLE, TRUE	toggles the application size and location for displaying on top of the VideoLooper application
getCamValues	FALSE	FALSE, TRUE	populates camera values - brightness, contrast, saturation - from camera MUST deselect to change values
printDefaults	FALSE	FALSE, TRUE	not used

Name	Default Value	Value Range	Description
getFocus	FALSE	FALSE, TRUE	not used
aFocus	FALSE	FALSE, TRUE	turns on autofocus on camera
focusValue	0	0	changes camera focus
getExposure	FALSE	FALSE, TRUE	get current exposure value from camera
aExposure	FALSE	FALSE, TRUE	set auto exposure
exposureValue	0	0	current exposure value
aWhiteBalance	FALSE	FALSE, TRUE	auto white balance
whiteBalanceValu e	0	0	current white balance value
getWhiteBalance	FALSE	FALSE, TRUE	get white balance value from camera
brightnessValue	0	0	current brightness value
contrastValue	0	0	current contrast value
saturationValue	0	0	current saturation value
sharpValue	0	0	current image sharpness
gainValue	0	0	current image gain
powerFreq	0	0,1	frequency of AC power in installation location
backLight	0	0,1	compensates for backlight conditions in bright spaces
zoom	0	0,1	controls camera zoom - not used
pan	0	0,1	controls camera pan - not used
tilt	0	0,1	controls camera tilt - not used
roll	0	0,1	controls camera roll - not used

Pareidolium

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View of the Pareidolium software functioning normally with GUI

The parameters outlined below are those found in the GUI panel called main. They are most commonly used to change the idle behavior of the tank and enter different debug modes for testing static images in the tank.

Additional parameters can be adjusted when in debug mode to control the tank operation, but should not be used without assistance from Antimodular. A full description of the GUI values can be found in <u>APPENDIX IX: COMPLETE GUI FUNCTIONALITY</u>.

Name	Default Value	Value Range	Description
showGui	FALSE	TRUE, FALSE	use the g key to show / hide the GUI elements
debug	FALSE	TRUE, FALSE	allows you to enter debug mode
stages	0	0,6	allows you to switch between normal operation and different debug modes
showDiagram	FALSE	TRUE, FALSE	shows / hides the labelled diagram of atomizers in the tank
diagramAlpha	127	0,255	changes the brightness of the diagram
idleAmount	5	0,100	how many idle-pixels get used
nextRandom	1	1,0	interval for next staggered idle-pixles to appear
idleOn	2	1,20	how long all idle-pixels stay on together
idlePauseDur	5	1,20	off time before new idle-pixels appear

VideoLooper



View of the VideoLooper software functioning normally with $\ensuremath{\mathsf{GUI}}$

The parameters outlined below are found in the GUI group named "splitting" and commonly used to adjust the grid layout and sizing for any display configuration or size. The camera lighting parameters can also be adjusted to improve image quality. A full description of the GUI values can be found in GUI <u>APPENDIX IX: COMPLETE GUI FUNCTIONALITY</u>. GUI settings other than the ones explained below should not be adjusted without consulting Antimodular.

Name	Default Value	Value Range	Description
fps	0	0,120	current runtime speed in fps
showGui	FALSE	FALSE, TRUE	use g key to show / hide the gui
fullscreen	FALSE	FALSE, TRUE	use f to make application fullscreen
showLive	FALSE	FALSE, TRUE	displays live video feed from overhead camera
liveVideoX	DISPLAY_WIDTH	0, DISPLAY_WIDTH	X offset of live feed
liveVideoY	DISPLAY_HEIGHT	0, DISPLAY_HEIGHT	Y offset of live feed
liveVideoScaler	0	0	scale of live feed
gridX	DISPLAY_WIDTH	0, DISPLAY_WIDTH	X offset of video grid
gridY	DISPLAY_HEIGHT	0, DISPLAY_HEIGHT	Y offset of video grid
gridScaler	0	0	scale of video grid
scaler	1	1	scaler for grid of videos
originX	0	-1920,1920	X origin point of video grid
originY	0	-1500,1500	Y origin point of video grid

Remote Access to Artwork's Computer

There is a software installed on the computer running this artwork that allows the studio to connect remotely to the artwork. This feature is helpful when you require assistance from the studio, as we can remotely connect to it, do a quick inspection, and do a debugging session of your components, if needed. In order to enable this feature, the computer has to be connected to the internet at all times. Depending on the computer's operating system (Windows 7/8/10, OSX), the procedure to set the computer online will vary. Please look online for tutorials, if necessary.

Preliminary Troubleshooting Steps

If a single atomizer is not working (not producing vapour)

Check if the disk shows signs of wear (dark spots) or is cracked. Refer to <u>APPENDIX VI</u> for the best way to identify a broken atomizer. If the atomizer is broken, replace it using the instructions listed in <u>APPENDIX VI</u>.

If a group of atomizers is not working (not producing vapour).

If a group of four or more atomizers are not working, cycle the power for the section they sit in. Do this by unplugging the power cord labelled with the name of the section where the affected atomizers sit.

If the problem persists, check for issues in the power lines. If there is a power sag, the DMX drivers will go into safe mode.

If this does not fix the problem, access the affected DMX driver by removing the side panel of the corresponding section using the provided Allen key. Refer to <u>APPENDIX V</u> for how to properly remove the sides of the tank. Inspect the wiring nearest to the affected drivers and use the wiring diagrams included in this manual to replace any wires that may have become dislodged.

A loose connection may also cause the driver to fail. If no wire is visibly dislodged from the surroundings gently tug on the wires attached to the affected DMX driver. If one gives way, place it back and tightly fasten it in place.

If an entire section of the atomizers are not working (not producing vapour)

Check the connections between the power plugs at the back of the tank. Are the four labelled plugs plugged in properly?

To cycle the power, should a section of the atomizers become unresponsive, simply unplug and replug these power cables. Use the keyboard to restart the computer, and see if the problem persists.

If there is water on the floor near the tank:

This could indicate a leak or spill out of the tank as a result of the condensation and the splashing of water, especially in periods of frequent use. For safety purposes, make sure to clean up any residual water off of the floor.

If there is water on the floor near the filtration system:

Check that the connection points on the filtration system are tight. If any connection is loose, firmly retighten it and clean up any spilled water.

If faces are not being detected.

Check if the tank's camera and the IR illuminator are correctly plugged in. Next, restart the **FaceTracker** app. Alternatively, you can also close all the applications and click on the **delayopen** icon on the desktop: a window will pop up and all the necessary software will open automatically, in a sequence.

If the images on the display are flickering.

The lighting in the room is unsuitable for the slow motion camera. Adjust the lighting until the flickering is reduced. The exact lighting in the room is a curatorial decision, however the light temperature must be above 4,500k and the recommended light sources are analog or high frequency LED's.

Troubleshooting Assistance

Prior to contacting the Antimodular Studio with a problem about your artwork, please ensure that you went through the preliminary troubleshooting steps outlined in the previous section.

The troubleshooting process will vary depending on the problem. In order to make the process easier, it is recommended that you collect and send the following information to the studio:

- Date and time when the problem first happened;
- Description of the problem;
- Actions taken so far and conclusions;
- Detailed photographs (or videos) displaying the problem;
- Detailed photographs (or videos) of the suspected faulty component;
- Detailed photographs (or videos) of the whole artwork and its surroundings;
- Personnel involved.

Support (Contact Us)

If you would like support for the piece, please feel free to call Lozano-Hemmer's studio in Canada:

Antimodular Research 4462 rue Saint-Denis Montréal, Québec, Canada H2J 2L1 Tel 1-514-597-0917 info@antimodular.com www.antimodular.com **APPENDIX I - INSTALLATION**

Description of Components

This artwork requires the following components:

Component	Amount	Description
Computer	1	Apple MacMini running the software that controls the artwork.
Overhead Camera	1	Used to display a view of the tank from above.
Overhead Camera Lens	1	Lens in use on the overhead camera.
Tank Side Lights	2	Used to illuminate the water vapor within the tank.
Tank Side Camera	1	Used to track the faces of people near the tank.
Tank Side Camera Lens	1	Lens in use on the tank side camera.
Infrared Light	1	Used to facilitate the tracking of faces of people near the tank.
Atomizers	544	Used to create the image in the water.
Water Tank	1	Contains the water and atomizers used to make the image.
Ethernet cables	2	The ethernet cables connect each of the DMX universes to the DMX controller.
DMX Controller	1	Connects to the computer in order to transmit DMX signals to the DMX boards.
DMX Drivers	24	Sends electrical signals to the atomizers that tell them when to emit vapour.
AC-DC Converter	24	Powers each individual DMX board.
Filtration System	1	Used to filter the water and clean the tank.

Wiring Diagrams and Connections

In order for the piece to run properly, the computer should be connected according to the following wiring diagrams.

Tank Wiring



Section Wiring

This is a zoomed in view of how each individual tank section is wired. You can use this diagram to understand how the DMX info and power are connected and passed on to each subsequent dimmer and power source within a section. Each section of the tank contains 136 atomizers.



Atomizer Wiring

This is a zoomed in view of how each block on a DMX controller connects to four atomizers. For section A2 and A1 one of the spaces on a DMX controller will send power to a LED spotlight. Each DMX controller has six of these blocks of four to control a total of 24 potential atomizers.



Filtration System



Atomizer Labeling

The diagram below shows how the individual atomizers are labeled. This may be used to help identify atomizers that need to be replaced or cleaned.



Reference Pictures

Use these pictures to help familiarize yourself with what the various components of the artwork look like when installed.

Power Management



Overview of the wires in the back of the tank.



Close up of the power cords in the back of the tank. Each power cord has its purpose labeled.



Switches for the four tank sections.

Tank Side Components





View of interior tank components



Close up of LED Tank Side Spotlight

View of tankside components



View of LED Tank Side Spotlight with power cord
Filtration System



Filtration System



Manual Timer used with the filtration system

APPENDIX II - TECHNICAL DATA SHEETS

Tank

The tank system is composed of the following parts.

Tank Side Light	Lights up the portraits created by the atomizers. It has a custom light cover which helps to focus and shape the quality of the light.
Infrared Light	Used to facilitate the tracking of faces of people near the tank.
Tank Side Camera	Tracks the faces of the participants.
Overhead Camera	Records the tank from an overhead position.
Camera Lens	Both cameras use the same type of lens to allow fine tuning of focus.
Computer	Runs the software necessary to track and record faces, send DMXsignals to the controllers and play back these recordings.
Atomizers	Emit jets of water and vapor to create images
Water Basin	The portion of the tank where the atomizers sit, holds the water necessary to run the piece.
AC-DC Power Converters	Provide power to all of the DMX controllers.
Power Cords	Provide power to the four main sections of the tank
Horse Hair Brush	Necessary to clean the individual atomizers

Tank Side Light

Manufactured By: Gantom Product Name: Gantom One Cool White



Max Wattage	4.8W
LED Wattage	4W
Input Voltage	9-24VDC (12VDC nominal)
Current Draw	400mA @ 12VDC
Beam Angle	2.7 degrees
Field Angle	4.5 degrees
Color Temp	6500K

A custom cover is provided for the tank side lights. It is 3D Printed in black plastic and coated on the inside in black felt.



Actual photo of the 3D printed cover object, interior black felt visible



View of the 3D printed cover object using software

Infrared Light

Manufactured By: Bosch. Product Name: EX12LED-3BD-8W Product Number: F.01U.172.644



LED Beam Angles	60° wide
Range	15 m (50 ft)
HFOV	17 m (56 ft)
Mount	1/4-inch-20 thread at bottom and rear
Dimension (WxDxH)	74 x 70 x 70 mm (2.9 x 2.8 x 2.8 in)
Weight	454 g (1.0 lbs)
Operation Temperature Range	-50 °C to +60 °C (-58 °F to +140 °F)
Power Draw	9W
Power Supply	12-24 VDC

Tank Side Camera

Manufactured By: Kurokesu. Product Name: USB camera C1 Product Number: CAMUSB1

Resolution (H \times V)	1920 рх х 1200 рх
Sensor Type	СМОЅ
Frame Rate	150FPS
Interface	USB 3.0
Power Supply	USB 3.0 Interface
Power Requirements	3W
Dimensions	Length 29.3 mm x Width 29 mm x Height 29 mm
Weight	80g

USB camera C1

2017-02-12 | info@kurokesu.com | www.kurokesu.com | +370 657 66497

KUROKESU



OVERVIEW

Superior low light performance USB camera capable of 1080p@30fps with h.264 on-board compression codec featuring Aptina AR0330 sensor in a solid aluminum case.

FEATURES

- High quality industrial 6061-T6 black anodized aluminium case
- 1"-20TPI mount for CS lens
- Multiple mounting options (all side walls and top has M3 tapped holes) for machine vision or robotics
- 1/4"-20TPI UNC thread for tripod mounting
- Format: 1/3-inch (5.8mm)
- Sensor: Aptina AR0330
- Imaging area: 2304H x 1536V (5.07mm x 3.38mm)
- Sensor pixel size: 2.2µm x 2.2µm
- Sensor dynamic range: 72.4dB
- Sensor sensitivity: 1.9 V/lux-sec (550nm)
- YUY2/MJPEG/h.264 compression
- UVC compatible
- USB 2.0
- 3D model can be found at: https://github.com/Kurokesu/3d_models
- Interchangeable filters (Low pass 650nm installed by default)
- Non cropped sensor operation in all resolutions
- · Each camera has unique serial number
- Multiple cameras can be connected to single host

SPECIFICATIONS

Sensor size 1/3-inch / 5.8mm Imaging area 5.07mm x 3.38mm Shutter Electronic Rolling Shutter	
Imaging area 5.07mm x 3.38mm Shutter Electronic Rolling Shutter	
Shutter Electronic Rolling Shutter	
Sensitivity 1.9 V/lux-sec (550nm)	
Sensor dynamic range 72.4dB	
Sensor pixel size 2.2µm x 2.2µm	
Frame rates h.264 - 30fps in all modes MJPG - 30fps in all modes YUV 4:2:2 (YUYV) 1920x1080 - 5fps 1280×720 - 10fps 640×480 - 30fps	
Output dimensions 1920×1080, 1280×720, 640×480, 640×360, 320×24 320×180 320×180),
Scan Progressive	
Exposure White balance (2800°K – 9300°K) Gain Manual control Gamma Backlight compensation Sharpness, Contrast, Saturation, Hue, Brightness, Anti-flicker frequency	
2W max Rated power 350mA @ 5V - h.264 290mA @ 5V - MJPEG / YUYV	
Interchangeable filter 17×17×0.5mm. Low pass 650nm filter installed by default, high pass 930nm filter available on request	
Supported OS Linux Android	
Sensor Aptina AR0330	
Weight 53g	
Dimensions 40×40×23mm	
Lens mount C / CS-mount	
Operational temperature -50 85°C	





Overhead Camera

Manufactured By: Basler. Product Name: acA1920-150uc Product Number: 107262



Camera Lens

Manufactured By: Computair. Product Number: T4Z2813CS-IR

This lens is used in the camera attached to the side of the tank. The camera has "1/3" 2.8-12mm F1.3 Varifocal, Manual Iris and a (CS Mount).



Computer

At the time of writing this manual, the software operating on the computer is coded under openFrameworks' platform. Software version referred to in this manual should be run on an Apple MacMini with an Intel i7 3.2Ghz processor, an Intel UHD Graphics 630 Card, 16GB of RAM and 500GB of HDD, running on OSX 10.14.6.

Atomizers

Any replacement atomizer must meet the exact diameter measurement of the base and supplementary measurements as seen below. Care should be taken when ordering replacement atomizers as the placement of the small post seen to the right of the wire in the images below may differ, indicating the use of a differently timed sensor.

Consult the studio before ordering any new atomizers.

Height from Base of Atomizer	44 mm
Diameter of Base of Atomizer	45.5 mm
Height from tip of thinner nozzle extrusion to larger nozzle extrusion	14 mm
Height of larger base nozzle extrusion	4 mm



Diameter of an atomizer

Other atomizer measurements

26 mm

DMX Converter

Manufactured By: Enttec. Product Name: DMX USB PRO Mk2. Part Number: 70314



Number of Channels	1024
Number of Universes	Two DMX512
Data Input	USB 2.0-Micro USB
Data Output	DB-15

The DMX controller outputs data in a DB-15 format to two separate DMX cables. A special cable is used to convert the DB-15 signal to a 5 pin DMX cable. A pinout of that cable can be seen below. That cable is then converted to an RJ-45 plug using the adapter seen below.





Pinout of the DB-15 Cable



5-pin DMX to RJ45 Adapter

DMX Controller



EAD means chasing effects, total 4 effects selectable from 01-04. Click "Up" or "Down" button to select the menu, then click "Enter" button to enter into the effect, then click "Up" or "Down" button to select from 01-04.

CA01: Fade-up (0%-100%) and fade-down (100%-0%) of output 1, then output 2, output 3, cycling chasing .., output 24, output 1,

- CA02: Fade-up (0%-100%) of output 1, then simultaneous fade-down (100%-0%) of output 1 and fade-up (0%-100%) of output 2, simultaneous down of output 2 and up of output 3,, simultaneous down of output 23 and up of output 2, simultaneous down of output 2 and up of output 3, output 24, simultaneous down of output 24 and up of output 1, . cycling chasing
- CA04: Fade-down (100%-0%) of output 1, then output 2, output 3,, output 24, output 1, . CA03: Fade-up (0%-100%) of output 1, then output 2, output 3, ., output 24, output 1, , cycling chasing cycling chasing

 \square

II. For run1 DMX decoder mode: After power on the decoder, if keep on clicking Up button. you will find below menu on display:

DMX signal indicator : When DMX signal input is detected, the indicator on PMX the display following after A turns on red

- BXXX Means DMX address. fa ctory defaults setting is 001
- Means DMX channels quantity. factory defaults setting is Ch24
- Means Bit (8bit or 16bit). factory defaults setting is 16bit
 - Means output PWM frequency. factory defaults setting is 1K HZ
 - Means output dimming curve gamma value, factory defaults setting is ga 1.5
- Means Decoding mode, factory defaults setting is dp1.1
- nuni Means the device at run1 mode (DMX decoder mode).

By holding button Back + Enter together at the same time over 5 seconds until the display go off, it will restore default settings .

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××

select menu AXX , click button "Enter", display flashes,then click or hold button "Up" / "Down" to set DMX address (click is slow, hold is fast.), then click button"Back" to confirm.

2. DMX channel quantity setting:

Select menu \bigcirc XX, click button "Enter", display flashes, then click button "Up" / "Down" to set DMX channel quantity, then click button "Back" to confirm. For example the DMX address is already set as 001. CH01=1 DMX address for all the output channels, which are all address 001. CH24=24 DMX addresses, output 1-24 is address 001-024 respectively.

teres and and a station of the statement	DMX add	ross is 00	1 CH94			
or menu and a click button "Enter", display flashes, then click	DMX Console Slider numbe	dp1.1	dp2.1	dp3.2	dp3.4	dp4.3
יסון עד דעמאון וע פוועסאפ עס טר וס טון, ווופון פוופא שמונטון שמכא נע firm.	1	output 1 dimming	output 1 dimming	output 1&2 dimming	output 1&2 &3&4 dimming	output 1&2 &3 dimming
utput PWM frequency setting:	2	output 2 dimming	output 1 micro dimming	output 1 dimming	output 1 &3 dimming	output 1 dimming
on "Up" / "Down"to choose 00~30, then click button "Enter", display flashes, then click	. 3	dimming output 4	output 2 dimming output 2	dimming	output 2&4 dimming output 5&6	dimming output 3
טערב, עו=וגרב, עב=בגרבט=טערב. utput dimming curve gamma value setting:	5	output 5	output 3 dimming	output 3 dimming	6.788 aimming output 5&7 dimming	output 4&5 &6 dimming
ict menu $egin{array}{c} B & B & XX \end{array}$, click button "Enter" , display flashes, then click (6	output 6 dimming	output 3 micro dimming	output 4 dimming	output 6 &8 dimming	output 4 dimming
I button "Up" / "Down" to choose 0.1~9.9, then click button"Back" to	7	output 7 dimming	output 4 dimming	output 5&6 dimming	output 9&10&11 &12 dimming	output 5 dimming
1.0	8	dimming	micro dimming	dimming	dimming	dimming
	9	dimming output 10	dimming output 5	dimming output 7&8	&12 dimming output 13&14&	89 dimming output 7
gamma value	± ;	output 11	micro dimming output 6 dimming	output 7	15&16 dimming output 13&15	output 8
put <1 / / / /	12	output 12	output 6 micro dimming	dimming	output 14 &16 dimming	dimming
	13	output 13 dimming	output 7 dimming	output 9&10 dimming	output 17&18& 19&20 dimming	output 10&11 &12 dimming
	14	dimming	output 7 micro dimming	dimming	dimming	dimming
	15	dimming	dimming	dimming	&20 dimming	dimming
MX decoding mode setting:	16	dimming output 17	micro dimming output 9	dimming output 11	23&24 dimming output 21&23	dimming output 13&14
oct menu 📴 🗒 XX , click button "Enter", display flashes, then click butt	n 18	output 18	output 9	output 12	output 22	output 13
// "Down" to choose the decoding mode, then click button "Back" to conf xx" means the DMX address quantity used for control of corresponding	m. 19	output 19 dimming	output 10 dimming	output 13&14 dimming	L.	output 14 dimming
ut channel quantity. 1st "x" is DMX address quantity, 2nd "x" is PWM chantity.	1nel 20	dimming output 20	output 10 micro dimming output 11	dimming output 14		dimming output 16&17
e gamma value is set lower than 1.4, and the lower the value is, the more	22	output 22 dimming	output 11 micro dimming	output 15&16 dimming		output 16 dimming
bie the micro dimming effect will be.	23	output 23 dimming	output 12 dimming	output 15 dimming		output 17 dimming
A address is out, chut DMX Console	24	dimming	micro dimming	dimming		dimming
Slider number dp1.1 dp2.1 dp2.2 dp3.1	25		dimming output 13	dimming output 17		&21 dimming output 19
A criatine all output all output all output all output	27		output 14	output 18		output 20
1 dimming dimming dimming	28		output 14 micro dimming	output 19&20 dimming		output 21 dimming
2 all output all output all output all output all output all output	g 29		dimming	dimming		&24 dimming
3 all output	30		micro dimming	dimming		dimming
st circuit protoction	31		dimming output 16	dimming output 21		dimming output 24
in the unit protection for the connected load is detected, the display will flash to m and the load will be forced to open circuit status. Once the fault is	33		micro dimming output 17 dimming	dimming output 22 dimming		dimming
oved, the decoder will recover after re-powered on.	34		micro dimming	dimming		
data definitions for strobe The supported RDM PIDs are nnel are as follows: as follows:	35		dimming output 18	dimming output 24		
5),//slow_strobe>fast strobe DISC_UNITE	37		output 19 dimming	6		
127},//undefined DEVICE INFO 127},//slow push fast close DMX_START_ADDRESS	38		output 19 micro dimming			
,133},//undefined 189),//slow close fast push SOFTWARE VERSION LABEL	39		dimming			
2501 //random strobe DMX_PERSONALITY_DESCRIPTIO	40		micro dimming			
, 255),//undefined SLOT_INFO SLOT_DESCRIPTION	41		dimming			
tore to Factory Default Setting SUPPORTED_PARAMETERS	42		micro dimming output 22			
s and hold down both "Back" and "Enter" keys until the digital display turns off	44		dimming output 22			
ngs will be restored to factory default.	45		output 23			
Address Code: a001	46		output 23 micro dimming			
A Resolution Mode: bt16	47		dimming			
ma: ga1.5	48		micro dimming			
Daing Mode: ap1.1						

e effects It 13&14& dimming utput 13 dimming output 14

imming it 13&14&15 be effects but 16&17& 3 dimming putput 16 dimming output 17

16 dimming dimming output 178/186 output 16 dimming dimming output 178/186 output 16 dimming output 178/186 output 16 output 178/186 output 16 output 178/186 output 16 output 28 output 28 output 28 output 28 output 178/186 dimming output 178/186 dimming output 178/186 dimming output 28 output 18 dimming output 18 dim

output 15 output 15 loc output 15 loc output 16 loc output 17 loc output 17 loc output 17 loc output 17 loc output 192/03 output 192/03 output 192/03 output 192/03 output 192/03 output 20 output 20 dimming output 20 dimming output 22 dimming

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16&17&18 198,208

dimming dimming

It 23

&24 strobe

ellect

dimmi output: dimmir output 19&20 &23&24 strob

output 2

ut 10&11&

dimming output 14 output 15 dimming output

output 13&14& 15&16 dimming output 13 dimming dimming

output 3 output 18 outpu

dimming utput 13&14&

utput 1

outpus outpus filmming dimming dimming dimming

output 5&6 dimming output 5

output 4

&11&

dimming output 9 output 10

Jutput 18/2 8.3 dimmin output

output 1&2 &3&4 dimming output 1

output 1&2 k3&4 dimmir output 1 dp6.4

output 1&2 &3&4 dimmin output 1

output 1&2 &3&4 dimmin dimming output 2

dp8.6

dp9.6

dp5.3

dp5.4

Sho Characterization Control Control

	2	1 al	DMX Console Slider number DMX channel	
		ll output imming	dp1.1	
	all output micro dimming	all output dimming	dp2.1	
	all output strobe effects	all output dimming	dp2.2	
all output	all output micro dimmin	all output dimming	dp3.1	

, 189},//slow close fast push	, 133},//undefined	127},//slow push fast close	71},//undefined	5}.//slow strobe>fast strobe	1/lundefined	nnel are as follows:	data definitions for strobe	oved, the decoder will recover afte	m and the load will be forced to ope	ort circuit of the connected load is	rt circuit protection	
SOFTWARE_VERSION_LABEL	IDENTIFY_DEVICE	DMX START ADDRESS		DISC_MUTE	DISC UNIQUE BRANCH	as follows:	The supported RDM PIDs are	er re-powered on.	en circuit status. Once the fault is	detected, the display will flash to		

Water Basin

The tank is built with white polypropylene. capable of holding up to 200 liters of water. It is supported by an aluminum structure and encased with black powder-coated aluminum panels along its contour. The gaps between the panels are sealed with black caulking.

Refer to the next section of the manual "<u>APPENDIX III PLAN VIEW OF THE TANK</u>" for detailed diagrams.

AC-DC Converter

Manufactured By: Mean Well Product Name: Switching Power Supplies 350.4W 24V 14.6A W/ PFC Product Number: UHP-350-24

This takes in AC 100-240 V 4A and outputs 24 V.



Power Cords

At the back of the tank near the mounted camera, five AC cables exit. The initial cable is designated for the IR light, labeled "IR" for clarity. This power cord outputs 12V at 3A. The remaining four cables necessitate individual 2400W circuits. Each cable powers a quarter of the atomizers and is denoted as A1, A2, B1, and B2, reflecting the corresponding quarter they supply power to (refer to the wiring diagram for details). For ease of use the four section cords will be plugged into two larger switches seen in the image below.





IR spotlight power cable

Power cord for each section of the tank



Switches for the four tank sections.

Horse hair brush

Manufactured By: McMaster Carr Product Name: Low-Scratch Brush with Shank Part Number: 4890A11



Filter

The filter system is composed of the following parts.

Pump	Pushes the water through the filtration system.
UV Lamp	Sterilises the water.
Sediment Filter	Filters out larger debris.
Water Softener	Used to reduce Calcium and Magnesium build up in the water.
Flexible hose	Used to connect the components of the filtration system.
Rigid hose	Used to connect the components of the filtration system.
Push to connect fittings	Used to connect the components of the filtration system.
Garden Hose	Used to connect the filtration system to the tank.

Pump

Manufactured By: Powermax. Product Name: 3.0 GPM RV Water Pump Product Number: 4008-101-A65



Power Draw	12V 2 A
Dimensions	25.4L x 25.4H Centimetres
Flow Rate	3 Gallons Per Minute

UV Lamp

Manufactured By: Sterilight Product Name: Sterilight S1Q-PA Ultraviolet (UV)



Max Flow Rate (UV dose >30 mJ/cm2)	2 GPM (7 LPG)
Max Flow Rate (UV dose >30 mJ/cm2)	1.5 GPM (5 LPG)
Chamber Length	15.0 in / 38.1 cm
Chamber Diameter	2.5 in / 6.4 cm.
Controller Dimensions	7.3 x 3.2 x 2.5 in / 19 x 8.1 x 6.4 cm.
Lamp Bulb	Sterilume-EX Model S287RL
Power Source	100-240 v, 50/60 HZ
Power Consumption	19 watts
Lamp Power	14 watts
Plumbing ports	1/4 MNPT

Sediment Filter Casing

Available From: McMaster Carr

Product Name: Plastic Filter Housing for Sediment and Rust, Clear, 1/2 NPT, 9-3/4" High Cartridge Product Number: 4422K32



Pipe Connection Type	Threaded
Pipe Size	1/2
Thread Type	NPT
Dimensions	Diameter 4 11/16, Height 12 1/8
Maximum Flow Rate	10 GPM
Cartridge Dimensions	Diameter 2 5/8 , Height 9 3/4
Cartridge Model Number	7191K11
Filters Particle Size	20 microns

Water Softener

Available From: McMaster Carr Product Name: Water Softener 3/8 NPT, 2-1/2" Cartridge OD, 10" Cartridge Height Product Number: 8986t16



Pipe Connection Type	Threaded
Pipe Size	3/8
Thread Type	NPT
Dimensions	Diameter 4 1/2, Height 12
Maximum Flow Rate	0.75 GPM
Cartridge	Diameter 2 1/2 , Height 10
Cartridge Model Number	8986T54
Grain Capacity	750

Flexible Hose

Available From: McMaster Carr Product Name: Firm Polyurethane Tubing for Air and Water 21/64" ID, 1/2" OD Product Number: 5648K78



Length	50 Ft

Rigid Hose

Available From: McMaster Carr

Product Name: Hard Polypropylene Plastic Tubing for Air&Water Semi-Clear White, 3/8" ID, 1/2" OD

Product Number: 5392K15



Length

10 ft

Garden Hose

Available From: Rona Product Name: Light Duty Garden Hose - 5/8'' x 50' Item Number: 000144798



Push to Connect Fittings

Available From: McMaster Carr

Product Name: Push-to-Connect Tube Fitting for Air and Water Tee Connector for 1/2" Tube OD Product Number: 5111K536



Shape	Тее
Tube Connection	Push to Connect
For Tube Diameter	1/2
Cartridge	Diameter 2 1/2 , Height 10

Monitor

The exact model of monitor is subject to a curatorial decision. However the monitor used must have a minimum resolution of HD and be between 10 inches in diagonal length and 45 inches in diagonal length.

APPENDIX III - PLAN VIEW OF TANK

Overall View



Exploded View



Aluminum Frame



71
Bottom Basin



72

Atomizer Face Plate



73

Side Cladding



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APPENDIX IV - ASSEMBLY OF THE WORK

Pareidolium uses four circuits to power the tank. Each section of the tank should be on its own 20A circuit. The other elements of the piece, the monitor, computer, and IR light should be on a separate, fifth circuit which can be 15A. Consult the wiring diagram in <u>APPENDIX</u> I for the power needs of each component.

When installing, ensure that the water level is at the desired level. Use the included water level indicator, if the water line is not at the green mark on the water level indicator add cold filtered water to the tank until it reaches that mark.

The room the piece is placed in must be properly ventilated. If placed in a well ventilated room the cold water vapour won't cause a significant rise in humidity levels. No air should be blown directly onto the piece for optimal performance.

The piece rolls on steel ball wheels. Floor protection is strongly recommended as the wheels can mark or damage floors. The piece uses two cameras: one mounted to the top ring of the fountain (to capture participants' faces) and one overhead (to capture the vapour portraits in the tank.)

The camera mounted to the rim of the tank should be pointed towards the opposite side of the fountain, where participants stand, pointed upwards at the face of the person standing in front of the piece. The IR light above the camera helps ensure that the participant's face is properly lit, ensuring good face detection. The camera must be positioned so that the thread on its base is pointing upwards towards the IR light. Refer to the images below for reference.





Side view of the counted camera and IR Light

Front facing view of the counted camera and IR Light

Place the overhead camera on the ceiling, ensuring it has an unobstructed view of the entire fountain. Depending on the room specifications, this overhead camera can be mounted to a pole or mounted above the tank. In the image below a clamp is used to attach the camera to an exposed pole.



View of the overhead camera

The overhead camera should be mounted so that the camera's label appears as seen in the image below with its mounting thread facing rightwards when looking at the piece from the view of a participant.



View of the overhead camera

Confirm that this camera is properly mounted by checking the live view of the piece in the software. If the lights affixed to the side of the tank appear in the top portion of the projection as seen in the image below the camera is properly placed.



View from the overhead camera

The exact lighting in the room is a curatorial decision, however the light temperature must be above 4,500k and the recommended light sources are analog or high frequency LED's. The room should be relatively dim to allow for the image created by the atomizers to be clearly visible. The two lights mounted to the rim of the tank are positioned downwards, illuminating the vapour in the fountain. The image below shows ideal lighting conditions for the tank.



View of a well lit tank

The computer should be placed a few feet away from the tank, as to not be damaged by water, but still accessible for troubleshooting purposes.

A projector should **NOT** be used to display this piece. Instead the piece should be displayed with a single monitor between 10 inches in diameter and 45 inches in diameter. This monitor should display the screen output from the VideoGrabber app. See "Detailed Technical Information" for more information on that particular app.

The brightness of the monitor is a curatorial decision based on the ambient light of the room. However the brightness and color temperature should match that of the tank. The display must be hung to the side of the tank or otherwise positioned so that it is **not** directly behind the tank. An example of acceptable positioning for the screen can be found in the image below where the screen is set to the side of the tank.



View of the square monitor and the projection.

The image below shows a previous installation that used two spotlights to illuminate the area where visitors should stand in order to have their face seen by the camera. This is not a desired setup. Spotlights should **NOT** be used as seen in the image below. However the area where visitors can stand should be outlined with footprints that are 1-2 inches from the rim of the tank. This will allow for optimal face tracking.



View of previous installation with spotlights (not to be used)

APPENDIX V - DISMANTLING THE WORK

Draining the Tank

You may need to drain the tank for a variety of reasons, for example before putting the tank into storage or after cleaning it.

Gather the materials listed below.

- A bucket if no sink or drain is available.
- The garden hose supplied with the tank.

1. Place the garden hose

Take the end of the garden hose and place it in a sink or similarly convenient place for the water to drain into. If no sink or drain is available, use buckets.

2. Connect the garden hose to the filtration system

Connect the other end of the garden hose to the "Hose" valve on the filtration system. See the image below for what that valve looks like.



Hose valve in opened position

3. Open the valve labelled "Hose"

Again refer to the image above. This shows the valve in the opened position.

4. Close the "Output" valve

Close the valve labelled "Output" on the pump assembly. Refer to the image below for what that valved in the closed position looks like.



Output valve in closed position

5. Connect the pump to its power supply

Allow the pump to run until the tank is fully drained.

6. Reset the tank

Once the tank is fully drained, turn off the pump. Turn both valves back to their original position and place the garden hose back to its storage location.

Removing the Tank Spotlight

You should only remove the lights on the sides of the tank if you are preparing the tank for shipment or you need to fully remove the inner side cladding to access the hidden atomizer posts.

Gather the materials listed below.

• A 5/32 hex key

1. Unscrew the light

The image below shows a tank spotlight normally installed. You'll begin the removal process by unscrewing the screw circled in red.



View of a fully attached spotlight

Put the screw back into its hole so that it doesn't get lost during the rest of the removal process. Turn the light slightly away from it to enable easier access to the grommet circled in red in the image below.



View of the spotlight after unscrewing it

2. Remove the lights grommet

Remove the grommet by gently pulling it out of the hole. The process can be seen in the image below.



Gently removing the grommet

3. Unplug the light

Tug on the wire gently until you find its power cord on the side of the tank. Take note of the number it uses so that you won't forget it later when it comes time to reattach it. Unplug the light from the power source and pull the wire gently through the hole the grommet was placed into. This process can be seen in the images below.



Detaching the power to the light

Pulling the wire the whole way through

Removing Inner Side Cladding

You should only remove the sides of the tank if you need to access the posts that secure the atomizer wires on the side, or if you need to reattach the lights to the side of the tank. See the previous section for instructions on how to properly remove the lights.

Gather the materials listed below.

- A 5/32 hex key
- Tweezers to remove caulk

1. Unscrew the sides

Remove all screws on the tip of the rim of the tank. One of the holes is circled in the image below. There should be two screws related to each of the four sections.



Top of a side of the tank with a securing screw removed

2. Remove the caulk

Next remove the caulk that runs along the seam between each section. Use the tweezers to gently pull it up, taking great care to not scratch the sides of the tank. The

image below shows a version of the tank where it was sealed with waterproof tape. Refer to it for reference.



Removing the tape between two sides of the tank

3. Lift the side off

After this the side is ready to be lifted. Have two people assist in this process, as in the image below, so that the side comes cleanly out. You should not need to apply great exertion to remove the aluminium side.



Two people lifting the inner side cladding of a tank free

4. Place the side safely down

Once the side is lifted clear, place it on the floor with a sheet of medium or thick foam underneath it to prevent the paint on the outside from scratching. Refer to the images below for reference.



Inner side cladding placed properly on a padded surface.

5. Placing the sides back

When placing the sides back on repeat these steps in reverse, using fresh caulk to seal the seams of the sides. Be sure to take note of the section label written on the inside of the aluminium case and place it back in its proper section.



Close up of the labeling on the inner cladding of the tank

APPENDIX VI - REPAIRS/ADVANCED MAINTENANCE

White Stains on Basin Walls

You may notice white stains as seen in the left hand image below accumulate in the tank. If you wish to clean them follow the procedure detailed below. After a cleaning the result should be similar to the image on the right hand side.



Basin wall with white stains



Basin wall cleaned of white stains

Gather the materials listed below.

- Double strength cleaning vinegar in a spray bottle
- Spray bottle with water
- 1 brush with polyester bristles, a handle of about 6 inches and brush size of about 3 in. wide and 3 1/4 in long.
- 1 brush with polyester bristles and a brush size of about 1 1/2 in. wide and 6 in long.
- A bucket

1. Turn off the atomizers

Turn the atomizers off by flipping the two main switches to the "O" position. You can see the switches in the image below. They are what powers the four sections of the tank.



Switches for the four sections of the tank

2. Spray the white-stained areas with double-strength cleaning vinegar

Make sure to thoroughly coat the area you want to clean.

3. Using the provided brush, scrub the stains heavily

You should use the larger brush to scrub the wide open surface area of the sides. Use the smaller brush to reach into the corners of the tank and other hard to reach areas. Be careful not to touch or damage the surface with the sides of the brush.

4. Spray the area with water

This will help to wash away the vinegar, brush the whole surface again taking care again to not damage the surface with the sides of the brush.

5. Rinse the surface and basin thoroughly with water

Use a bucket or similar method to flood the surface gently with water and wash off any remaining vinegar or debris.

6. Empty the basin

Refer to section "<u>DRAINING THE TANK</u>" in APPENDIX V on how to properly drain the tank.

7. Fill the basin with clean water

Use your bucket to fill your basin. Using the provided level measurement fill the tank to the green level. Be sure to use cold filtered water if possible, and **NEVER** use distilled water.

8. Restore power to the atomisers

Turn the atomizers off by flipping the two main switches to the "O" position.

WARNING: Skipping steps 6 and 7 will result in substantial damage to the atomizers. They will break prematurely due to the acidity of the vinegar.

Water Level

To ensure optimal functionality, the piece requires a consistent water level at all times. The tank's water levels will change depending on how often the atomizers are activated, and the temperature and the humidity levels of the room, and you will therefore need to manually add water to the tank accordingly. The water level should be checked and adjusted every three days.

A water level indicator is positioned within the tank, with the green line representing the desired level. The upper orange line indicates the maximum level to prevent overfilling, which could lead to water spillage onto the floor and internal components of the artwork. The lower orange line denotes the minimum level permissible during exhibitions. Falling below this level poses a risk of causing irreversible damage to the atomizers. Each line, including the white ones, represents approximately a 10L difference.

During exhibitions, it's highly recommended to keep the water level as close to the green line as possible to ensure proper atomizer behavior.

See here, the level indicator with the desirable level of water, and the part on its own.



Water Level indicator with water hitting the green line



Water Level indicator out of the water

Scratches and rust

The paint on the tank protects the metal from corrosion. If the paint gets scratched, rust might start to form. This is a problem visually and for metal integrity. Since this piece creates water droplets in the air, it is a high humidity environment and the rust can form and attack the metal quicker than in any other condition.

We recommend using Paraloid B-72 on the rusty areas to stop it from advancing. Note that this resin is transparent but still visible to the eye since this won't match the paint color.

Wet Cleaning the Atomizer Disks

Wet cleaning should happen every four months or when atomizers begin to show signs of white calcium stains. You can test to see if a cleaning is necessary by brushing one with the drill attachment, and seeing if plumes of whitish materials are dislodged. Follow the steps below to properly wet clean the atomizers.



Plumes of white calcium agglomerate material exiting the atomizer while brushing

Gather the materials listed below.

- Horsehair brush small enough to fit within the atomizer disc.
- Extension tool to attach the horsehair brush to a handheld drill.
- Handheld drill.
- A medium sized bucket.
- Wet vacuum cleaner with attachment suitable for reaching into the tank.
- Bucket or hose to refill the tank if cleaning in the middle of the show.
- Water line indicator if refilling the tank after a cleaning.

1. Brush the inside of the atomizers.

Attach your horsehair brush to its extension tool onto your handheld drill. Using a relatively slow pace, clean the inside of each atomizer disk. As you go use the wet vacuum cleaner to remove debris from the tank.

A wet vac is preferred but if one is not available there is a hose coiled under the tank that can be used to help drain it. See the images below for what the hose should look like.



View of the hose tucked under the tank

This hose is weaker than a wet vac so it should only be used as a backup. If utilizing the hose to clear debris follow these steps.

a. Make sure the pump is Off

Turn the pump off by unplugging it or otherwise removing power.

b. Place the tip of the hose in the water

The tip of the hose should have a blue attachment as seen in the close up picture below. Place this in the water near a recently cleaned atomizer.



Close up of the blue attachment at the end of the hose c. Close the grey valve under the tank

Turn the valve circled in the image below into the close position by moving it counter-clockwise.



Close up of the grey valve underneath the tank

d. Open the blue valve on the hose

Turn the valve seen in the image below to the open position. In the image below it is in the closed position.



Close up of the blue valve at the end of the hose

e. Turn the pump on

This can be done simply by restoring power to the filtration system. Water and debris will now flow into the hose.

f. Restore the original conditions

When finished using the hose, make sure to turn the pump off, open the grey valve, and close the blue valve, then restore power to the pump.

2. Empty the tank.

After brushing all the atomizers, empty the tank. Follow the instructions in the previous <u>APPENDIX V</u>.

3. Rinse the Tank

Then use the bucket to rinse the tank with water. As you pour the buckets of water into the tank use the wet vac to remove any debris that is dislodged. Repeat this process until dumping a bucket of water does not dislodge visible particles.

4. Empty the tank

Now that the tank has been rinsed you must again empty it. Follow the instructions in the previous <u>APPENDIX V</u>.

5. Refill the tank

If the wet cleaning is being done in the middle of a show rather than at the end you must refill the tank. Using the bucket or a hose attached to a water source refills the tank to the proper water level. Make sure to check that the water line hits the green mark on the level indicator. **NEVER** use distilled water and ideally use cold filtered water.

Dry Cleaning the Atomizer Disks

Dry cleaning should only happen if wet cleaning didn't happen at the end of a show. Perform a dry cleaning before packing the piece for storage.

Gather the materials listed below.

- Horsehair brush small enough to fit within the atomizer disc.
- Extension tool to attach the horsehair brush to a handheld drill.
- Handheld drill.
- Dry vacuum cleaner.

1. Empty the tank

Before cleaning the atomizer disks be sure to fully empty the tank. Follow the instructions in the previous <u>APPENDIX V</u>.

2. Brush the inside of the atomizers.

Begin by first using the smaller horsehair attachment. Using a relatively slow pace, clean the inside of each atomizer disk. As you go use a dry vacuum cleaner to remove debris from the tank. Use the images below as reference.



Dry cleaning the atomizers with a horsehair brush



Dry cleaning the atomizers with a horsehair brush close up.

Identifying Broken Atomizers

Visually

The following images provide visual reference for functioning and non functioning atomizers. A working atomizer will have a consistently white disk on its inside. A disk that has black visible inside this inner area is likely to be broken. Similarly any disk that has blue or green coloration on its outside rim or the inside is also likely to be damaged and non-functioning. Once a potentially damaged disk is noted it should be confirmed to be non functioning using the software.



Functioning Atomizer





Broken Atomizer

Oxidized Atomizer

Using software

The best way to test if an atomizer is broken is to use the software to activate the row that it sits in and observe if water vapour is emerging from it.

Gather the materials listed below.

• Zip ties

1. Navigate to the Pareidolium app

Press G once. This activates the GUI in the current app, and unlocks the mouse cursor. Then Use the Ctrl+arrow keys to select the Pareidolium app. Once selected, press G again to activate its GUI. You should see something like the image below.



Pareidollium with its gui opened and set into debug mode

2. Enter Debug Mode

Tick the "Debug" box situated at the top left. Then move the "stage" slider to "debug". You should now see the word debug displayed in the box labelled stage. See the image below.

20 Se2 Se2 Se1 Se8 Se8 S10 S17 S15		751	SST		9 9 192									
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				2	LSZ ES	5 48 5		TPZ	152	533	221	TAT	0.	

3. Activate Rows or Columns

Use the arrow keys to activate rows or columns of atomisers. This should highlight each set of atomizers on the tank map image.

Alternatively, you can hover the mouse cursor over pixels in the diagram to activate them individually. Hovering over an atomizer will also give you its IP and address information.

You can see an example of what an activated row with an individual atomizer hovered over to reveal information about itself looks like in the image below.



Close up of an activated row of atomizers with one highlighted

4. Mark broken atomisers

Use this software to activate a row of atomizers at a time, sweeping from one end of the tank to the other. When you activate a new row watch closely to see if any atomizer is not running. You may need to wave your hand or a large flat object in order to clear the vapor as it accumulates in order to get a better view of the tank.

When you encounter a broken atomizer mark it as seen in the image below with a zip tie. This will make the replacement process easier.



Broken atomizers marked with zip ties



Close up of gently inserting a zip tie into the atomizer hole

5. Note the index of the broken atomizer

Now identify the index of the broken atomizer in the software. When looking at the software the upper edge of a row is related to the left hand side of the tank assuming the viewer is standing where participants stand and looking towards the tank side camera. Similarly the lower edge of a row in the software relates to the right hand side of the tank from the same perspective.

For example if you have identified a broken atomizer that is the third on the right hand side of the tank you would look at the corresponding row in software and count upwards three from the lower edge of the tank. This is the index of the broken atomizer. Hover your mouse over the atomizer and record its index number. This is critical as it will tell you which power supply to attach the new working atomizer to. You **cannot** skip this step.

Replacing Broken Atomizers

After identifying and marking a broken atomizer you will need to replace it. Follow the process below closely. Before beginning this process be sure that you have followed the directions in <u>APPENDIX VI: Identifying Broken Atomizer: Using Software</u>, to get the number and position of the malfunctioning atomizer. You will not be able to replace a broken atomizer without this information.

Gather the materials listed below.

- Thin string or fishing line at least three feet long.
- Wire cutters
- Replacement atomizer

1. Prep the replacement atomizer.

The replacement atomizer will likely have a plastic or soft rubber grommet attached to its wire as seen in the images below. This is unnecessary and will impede properly placing the atomizer so it must be removed.



Close up of a grommet on an atomizer



Close up of a grommet on an atomizer

Take wire cutters with similar sized blades as those pictured below and use them to gently cut one side of the grommet.



Suitable Wire cutters Now use your hands to peel the grommet gently off.



Peeling the grommet off

This should leave a smooth and undamaged wire as seen below. If you accidentally clip the wire casing you will need to select a new atomizer and try again.



Atomizer with the grommet removed

2. Remove the atomizer from it's seat

Begin by taking a zip tie and gently sliding it through the hole on one side of the atomizer



Threading a zip tie through an atomizer

Continue to pull it gently through to the other side of the atomizer.


Completely threaded atomizer

Once you have gotten a zip tie fully through the holes in the sides of the atomizer connect the zip tie to make a solid loop. Use this to pull firmly up and dislodge the atomizer from its seating.



Complete zip tie handle for an atomizer

The atomizer should pop cleanly out revealing a clean white disk as seen in the image below.



Removed atomizer

3. Free the atomizer's wiring from its pegs.

Each atomizer is connected by one wire to its power source and DMX signals on the side of the tank. After you have removed the atomizer from its seating you will need to perform a similar process with its wire, removing it gently from its pegs all the way back to the side of the tank.

The further towards the centre of the tank the atomizer is seated the longer this process will take. Be patient and try to work as methodically as possible without disturbing other atomizers.

Remove the wire from its pegs by gently tugging upwards until it pops out as seen in the picture below.



Pulling the wire of an atomizer gently out

Start from the atomizer itself and move towards the edge of the tank. As you remove the wire from its pegs other wires will inevitably be dislodged as well. Be sure to tidy these as you work, when the wire for the damaged atomizer is freed and other wires move as a result place them back where they started immediately. This will keep the tank well ordered.

Once you have reached the edge of the tank you have finished this step in the process.



Atomizer wire freed up until the edge of the tank

4. Identify the atomizers wire on the outside of the tank.

You will have found the number associated with the atomizer while using the software to confirm that it was nonfunctional. You can also find the number associated with a broken atomizer by consulting the wiring diagram.

Take this number and find the appropriately labelled female and male power connector on the side of the tank that the atomizer sits in. It should look like the image below.



Atomizer female and male power supply

5. Tie your rope or fishing line around the connector on the outside of the tank.

Unplug the male power end from the female power end. Take your rope and tie a knot firmly over the male power end.



Properly secured female head of an atomizer

6. Free the atomizer's wiring from the pegs on the edge of the tank.

Underneath the metal lip of the side of the tank there are more pegs that keep the wire in place. The image below shows a clear view of these pegs when the side of the tank has been removed.



View of the pegs securing the wires to the side of the tank with the side cladding removed

It can be quite difficult to free the atomizer's wire from these pegs. Go slowly and take the time to perform this with care. You can tell that the wire has been freed from these pegs when you can gently pull on one side of the wire and see fluid movement on the other side.

7. Pull the power connector through to the inside of the tank.

Pull on the side of the atomizer wire that is on the inside of the tank until the female power cord is on the inside of the tank and easily accessible. Make sure that you leave enough rope on the outside of the tank to allow you to pull it back in in the following steps.



Female power supply pulled back into the tank

8. Place the new atomizer

Take the new atomizer and place it firmly in the seat of the previous atomizer.

9. Thread the new atomizer through the poles

Take the new atomizer's wire and thread it between the poles in the tank neatly to the side of the tank where the old atomizer is.

10. Tie the rope to the end of the new atomizer

Take the piece of rope tied around the old atomizer and untie it, retying it to the female power adapter of the new atomizer.

11. Remove the old atomizer from the tank and set aside

This minimises the elements that you're accounting for as you perform the next steps. You should dispose of the old atomizer. It does not need to be specially discarded as electronic waste.

12. Pull the end of the new atomizer back through to the outside of the tank

Tug firmly on the string without jerking to pull the female barrel jack to the outside of the tank where the older atomizer cable hung.

13. Plug in the new atomizer

Plug the female barrel jack into the male power supply.

14. Test the new atomizer

Use the same process detailed in <u>APPENDIX VI: Identifying Broken Atomizer: Using</u> <u>Software</u> to verify that the new atomizer works as expected.

Changing the Filters

The filter on the left is the water softener filter, which should only need to be replaced after 2 years of constant running.

The filter on the right is the sediment and rust filter, which should be inspected monthly and changed whenever debris or dirt accumulate substantially.

Replace the filter by taking the two cartridges circled in black in the image below. One at a time gently turn the cartridge counter clockwise until it is released. Replace the old filter inside each cartridge with the filter type specified in their technical datasheet within this manual.



APPENDIX VIII - PACKING

Transportation

The piece comes with a custom made dolly (see below). This dolly is made to transport the tank vertically. However, the tank should very rarely be vertical. It is detrimental to the structural integrity of the tank and is high risk when it comes to scratching the outside metal.

Turning the tank vertically requires at least 4 people because the tank is heavy and tall when vertical (2 meters high).



The custom dolly is made of metal and the contact between the dolly's metal and tank's metal will scratch the tank's paint. It is crucial to protect it with foam or a heavy duty plastic sheet.

Triangular pieces of foam should be placed between the dolly and the tank to stabilize it (see below).



We recommend adding as much protection as you can as if you were to crate the tank. Step 3, 4 and 5 of the section <u>Crating the tank</u> should be followed for transit.

Fabricating a crate for the tank

The crate should be openable on every side for an easier installation.

The inside dimensions of the crate should be: Width: $202 \times \text{Length}$: $202 \times \text{Height}$: 72cm. The tank is very heavy, estimated at 500 kg so the crater should reinforce the bottom of the crate so the wood doesn't crack when moved.

The tank should be held by wooden beams that are covered in foam to protect the metal surface (as seen in pictures below). More information on how to pack the tank in the crate in the section below.



Crating the Tank

1. Make sure that the tank has time to properly dry (3 days minimum) and that the tank has been recently tested for broken atomizers and cleaned thoroughly before crating (<u>see APPENDIX VI for instructions</u>). Be sure to take photos and carefully note the date of the cleaning/general condition of the piece

2. The tank shouldn't be in direct contact with any of the wood pieces holding it in place in the crate. Each piece of wood is, therefore, covered with 1" (or more) foam.

We suggest you make four L shaped wood brackets aligned with the corners of the crate. Pieces of foam glued to the side of the crate should be added to stabilize the tank while in transit. There should be at least 8 contact points between the crate and the tank. Again, each of these points are covered with foam to prevent scratching the surface.



3. Place a big circle shaped piece of foam in the bottom of the tank. This piece is there to protect the atomizers from dust, and any impact. This one is usually provided by the studio.

4. The flat top part of the tank should be covered with the 4 similar remaining pieces of foam (see below). Each end of these pieces is numbered. Place each number next to his corresponding number. The number should be visible once the packing is completed. That way the blocks that are glued underneath will help the foam stay in place. This flat top is the most likely to get scratched or damaged during transit. This step is crucial.



5. A X shaped or pyramid shaped piece of foam should be placed on top of the big circle foam (inside the tank on top of the atomizers) to prevent anyone from putting anything on top, as a reminder that nothing can be placed inside the tank. Any weight would damage the atomizers.



6. To close the crate, the side panel of the crate should be placed back first. Then, place the top of the crate.

7. During any manipulation, the artwork should be horizontal as it is designed to be presented and stored in this position. Any pressure on the side is detrimental to the structural integrity of the piece. A note that this crate is oversize and will not fit through regular doors.

Packing the filter

The other items (filter system and electronics) should not be packed with the tank. We recommend separating the electronics (computer, camera, monitor) and the filter system to prevent damaging the electronics with humidity.

Packing the Computer

Cover the computer in antistatic plastic. Ensure that all of the accessories associated with the computer such as usb extenders are packed along with the computer but not in the same box.

Packing the Cameras

Be sure that the lens of the cameras are covered with antistatic film to ensure it is protected from scratches.

APPENDIX IX: COMPLETE GUI FUNCTIONALITY

FaceTracker

Main

Variable	value settings	description
showGui	FALSE	A toggle that shows or hides the GUI
debug	FALSE	Puts the piece into debug mode
smallMode	FALSE	Unknown
smallWidth	DISPLAY_WIDTH,0, DISPLAY_WIDTH	Unknown
smallHeight	DISPLAY_HEIGHT,0, DISPLAY_HEIGHT	Unknown
smallX	0,0,DISPLAY_WIDTH	Unknown
smallY	0,0,DISPLAY_HEIGH T	Unknown
appWidth	DISPLAY_WIDTH,0, DISPLAY_WIDTH	changes width of the application window
аррХ	0,0,DISPLAY_WIDTH	changes X position of application window on screen
appY	0,0,DISPLAY_HEIGH T	changes Y position of application window on screen
showFilter	TRUE	shows the filter used to scale the video to small size
filterScaler	1,0	Unknown
filterX	0,-700,900	Unknown
filterY	0,-700,900	Unknown
small_filterX	0,-700,900	Unknown
small_filterY	0,-700,900	Unknown

Masking

The table below shows the values for each GUI variable at the time of acquisition

Variable	value settings	description
ROI_left	0,0,camWidth	adjusts outer ROI for face detection - left boundary
ROI_top	0,0,camHeight	adjusts outer ROI for face detection - top boundary
ROI_right	_camW,0,camWidth	adjusts outer ROI for face detection - right boundary
ROI_bottom	_camH,0,camHeight	adjusts outer ROI for face detection - bottom boundary

OSC

Variable	value settings	description
enableOSC	FALSE	send OSC messages to Pareidolium app
bClearBuffer	FALSE	celar OSC buffer
oscOutPort	9924,9923,9924	set the port to send OSC messages on
oscInPort	9923,9923,9924	set the port to receive OSC messages on
sendTolP	"localhost"	IP address to send OSC messages to - should always be localhost
oscSendInterval	10,0,100	how frequently OSC messages are sent
max_msgPerFrame	10,1,100	number of messages per OSC frame that can be sent
periodicResend	FALSE	periodically resend OSC messages for error control - not used
flipCoord	FALSE	flips the image coordinates along the vertical axis
mirrorCoord	FALSE	mirror the image coordinates along the horizontal axis
sendInvertedImage	FALSE	sends an inverted version of the filtered image - black is white, white is black?

Camera

Variable	value settings	description
getCamValues	FALSE	populates camera values - brightness, contrast, saturation - from camera MUST deselect to change values
printDefaults	FALSE	not used
getFocus	FALSE	not used
aFocus	FALSE	sets autofocus on camera
focusValue	0	changes camera focus via uvc
getExposure	FALSE	get current exposure value from camera
aExposure	FALSE	set autoexposure
exposureValue	0	current exposure value
aWhiteBalance	FALSE	auto white balance
whiteBalanceValue	0	current white balance value
getWhiteBalance	FALSE	get white balance value from camera
brightnessValue	0	current brightness value
contrastValue	0	current contrast value
saturationValue	0	current saturation value
sharpValue	0	current image sharpness
gainValue	0	current image gain
powerFreq	0,0,1	frequency of AC power in installation location - not used
backLight	0,0,1	compensates for backlight conditions in bright spaces
zoom	0,0,1	controls camera zoom - not used
pan	0,0,1	controls camera pan - not used

tilt	0,0,1	controls camera tilt - not used
roll	0,0,1	controls camera roll - not used

Video

Variable	value settings	description
mirror	FALSE	mirrors image along vertical axis
flip	FALSE	flips image along horizontal axis
useDebugFace	FALSE	adds a static image that follows the mouse which is visible in the debug panes and will render tracking info in the live video feed
showAllBlobs	TRUE	
showRegion	FALSE	add rectangle for ROI to the live camera feed
faceRectY	0,-50,50	adjust the height of the inner face detection ROI
detector_threshold	0	Unknown
detector_size	300,10,600	Unknown
dlib_inputScaler	0	scaler for face detection
dlib_preSmooth	1,0	Unknown
tracker_persistence	15,0,200	Unknown
tracker_maxDistanc e	500,0,500	Unknown
dyingTime	0	Unknown
minAge	15,0,50	Unknown
minSize	40,1,150	Unknown
maxSize	350,151,800	Unknown

foundFacesAmount	0,0,40	Unknown
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Unwarping

Variable	value settings	description
showGrid	FALSE	adds grid for image warping
useUnwarp	TRUE	use image unwarping for face detection
resetUnwarp	FALSE	reset the unwrap parameters
editTopRight	FALSE	allows you to edit the unwarping transform grid
topRight_x	camWidth,camWidth -200,camWidth	allows you to edit the unwarping transform grid
topRight_y	0,-400,400	allows you to edit the unwarping transform grid
editTopLeft	FALSE	allows you to edit the unwarping transform grid
topLeft_x	0,-400,400	allows you to edit the unwarping transform grid
topLeft_y	0,-400,400	allows you to edit the unwarping transform grid
editBottomRight	FALSE	allows you to edit the unwarping transform grid
bottomRight_x	camWidth,camWidth -200,camWidth	allows you to edit the unwarping transform grid
bottomRight_y	camHeight,0,camHei ght	allows you to edit the unwarping transform grid
editBottomLeft	FALSE	allows you to edit the unwarping transform grid
bottomLeft_x	0,-400,400	allows you to edit the unwarping transform grid
bottomLeft_y	camHeight,0,camHei ght	allows you to edit the unwarping transform grid

Remove Background

The table below shows the values for each GUI variable at the time of acquisition

Variable	value settings	description
use remover	FALSE	these settings change the way background subtraction is done for face detection
reset BG	FALSE	these settings change the way background subtraction is done for face detection
mode	1,0,1	these settings change the way background subtraction is done for face detection
mode name	1111	these settings change the way background subtraction is done for face detection
diffErode	0,0,10	these settings change the way background subtraction is done for face detection
diffDilate	0,0,10	these settings change the way background subtraction is done for face detection
diffBlur	0,0,50	these settings change the way background subtraction is done for face detection
diffMode	0,0,2	these settings change the way background subtraction is done for face detection
ignorForground	FALSE	these settings change the way background subtraction is done for face detection

bitFilter

Variable	value settings	description
blackOrWhiteMask	FALSE	change the way pixel resolution is constructed from original face image

clahe tileSize	1,1,32	change the way pixel resolution is constructed from original face image
clahe clipLimit	2,1,100	change the way pixel resolution is constructed from original face image
blurSize	0,0,10	change the way pixel resolution is constructed from original face image
bitErode	0,0,10	change the way pixel resolution is constructed from original face image
bitDilate	0,0,10	change the way pixel resolution is constructed from original face image
bitBlur	0,0,50	change the way pixel resolution is constructed from original face image
thresh blockSize	13,3,500	change the way pixel resolution is constructed from original face image

Pareidolium

Idle Behavior

The table below shows the values for each GUI variable at the time of acquisition

Variable	value settings	description
idleAmount	5,0,100	how many atomizers are turned on and off during the idle state
nextRandom	1,0	interval between when one idle pixel appears and the next one
idleOn	2,1,20	how long all idle-pixels stay on together
idlePauseDur	5,1,20	off time before new idle-pixels appear

OSC

Variable	value settings	description
enableOSC	FALSE	enables orc for receiving messages from FaceTracker application
oscOutPort	9924,9923,9924	port for sending OSC messages
oscInPort	9923,9923,9924	port for receiving OSC messages
oscSendInterval	10,0,100	how frequently OSC messages are sent
periodicResend	FALSE	

DXM

Variable	value settings	description
channelsPerUniv	1,0,MAX_CHANNEL S	maximum number of dmx channels for atomizer addressing
offLevel	2,0,4	
allOff	FALSE	turns off all dmx atomizers
allOn	FALSE	turns on all dmx atomizers
allFirstChan	FALSE	
useLedPanel	TRUE	not used
ledPanelON	FALSE	not used
ledPanelChan	509,1,512	not used
ledPanelLevel	255,0,255	not used
led PanelLevelA	26,0,255	not used
ledPanelLevelB	127,0,255	not used
ledPanelLevelMin	26,0,255	not used
useFan	TRUE	not used
fanON	FALSE	not used
fanChan	512,1,512	not used
fanLevel	127,0,255	not used

OSC to Recorder

The table below shows the values for each GUI variable at the time of acquisition

Variable	value settings	description
bRecTrigger	FALSE	not used
feedback	FALSE	?

Main

Variable	value settings	description
ver		
fps	0,0,120	current runtime speed of application in fps
showGui	FALSE	use g to show / hide gui
debug	FALSE	allows you to enter debug mode
invert	FALSE	switches pixels that are on to off and off to on
chaseChannels	FALSE	N/A
chaseDrivers	FALSE	N/A
chaseIndex	0,0,540	N/A
chaseUniIndex	1,1,2	N/A
chaseWait	1,0,5	N/A
showDiagram	FALSE	shows / hides the labelled diagram of atomizers in the tank
diagramAlpha	127,0,255	changes the brightness of the diagram
column	0,0,47	moves full pixel column when in debug stage
row	0,0,11	moves full pixel row when in debug stage

gridX	20,0,1920	places tank grid on screen
gridY	500,0,1080	places tank grid on screen
gridScaler	20,1,50	sets tank grid size on screen
maskWidth	2,0,24	
all pixels off	FALSE	turns all pixels on/off. also use key 1

Stages

Variable	value settings	description
stages	0,0,6	change this slider to change the tank mode - debug mode needs to be enabled possible stages are: idle - tank is in idle mode image - tank displays a preset image configured by imageIndex slider and the content adjustment slider debug - allows you to activate atomizers in rows or columns, or one by one live - listens for OSC messages with face data from face tracker, does not go into idle mode font - allows you to display the letter A in different orientations and sizes in the tank sequence - normal operation, transitions from idle to live when a face is detected osc - continuously displays current / last OSC message data from the FaceTracker
stage		string that displays the current stage
pixelThreshold	10,0,255	any pixel brighter than this will be ON. 0 means grayscale
contentRotation	180,0,360	rotates tank content
contentScaler	1,0	scales tank content
contentX	0,-200,200	offsets X tank content in debug mode
contentY	0,-200,200	offsets Y tank content in debug mode

imageIndex	1,0,10	in stage 2 selects file from folder bin/data/images
font_x	0,-10,30	sets font X position
font_y	0,-10,30	sets font Y position
font_size	14,10,50	sets font size

Sequence

Variable	value settings	description
enableSnapshot	FALSE	only take a short snapshot of live OSC face image
snapshotPause	3,0	pause before next seq can start again

VideoLooper

OvalMask

The table below shows the values for each GUI variable at the time of acquisition

Variable	value settings	description
maskType	0,0,1	not used
showMask	TRUE	adds mask over the grid of small images
showWhite	FALSE	shows white lines for framing
ovalX	1080	X offset of the masking oval
ovalY	1920	Y offset off the masking oval
ovalWidth	390,0,1200	controls the horizontal dimension of the masking oval
ovalHeight	1000,0,1920	controls the vertical dimension of the masking oval
gradientDistance	340,0,600	sharpness of the gradient along oval mask
mask_edgeWidth	100,1,500	not used
mask_outerRadius	1,1,100	not used
mask_innerRadius	100,1,1000	not used

PlyonCam

Variable	value settings	description
autoExposure	FALSE	use auto exposure for camera
exposure	0	current exposure value
autoGain	FALSE	auto gain on image
gain	0,0,1	current gain value

gamma	0,0,1	current gamma value
lightSourcePreset	0,0,3	adjust the brightness of the image based on light in the room

Video

The table below shows the values for each GUI variable at the time of acquisition

Variable	value settings	description
deviceID	0,0,2	device ID of the overhead camera
camFrameRate	30,1,60	adjust the framerate of the overhead camera
flip	FALSE	flip the image along the horizontal axis
roiLeft	20,0,ROTATED_WID TH	not used
roiTop	20,0,ROTATED_HEIG HT	not used
roiRight	ROTATED_WIDTH-2 0,100,ROTATED_WI DTH	not used
roiBottom	ROTATED_HEIGHT- 20,100,ROTATED_H EIGHT	not used
mirror	TRUE	flips the orientation of the layout

Most Recent

Variable	value settings	description
fadeMixSpeed	1,1,20	?

fadelnOut	TRUE	?
fadeOut recent	FALSE	?
showDuration	5,1,60	?
minAlpha	0,0,255	?

Layers

The table below shows the values for each GUI variable at the time of acquisition

Variable	value settings	description
outerPadding	30,0,200	padding around the video within its cell
x_offset	0,-500,1920	X offset of the video within its cell
y_offset	0,-500,500	Y offset of the video within its cell
squareZoom	1,0	not used
framePadding	5,0,100	

Main

Variable	value settings	description
fps	0,0,120	current runtime speed in fps
appFrameRate	30,1,120	
showGui	FALSE	use g key to show / hide the gui
fullscreen	FALSE	use f to make application fullscreen
showDebug	FALSE	shows debug information for each video in the grid
debugVideoX	DISPLAY_WIDTH-	X offset of debug info

debugVideoY	DISPLAY_HEIGHT	Y offset of debug info
debugVideoScaler	0	scale of debug video
showLive	FALSE	displays live video feed from overhead camera
liveVideoX	DISPLAY_WIDTH-	X offset of live feed
liveVideoY	DISPLAY_HEIGHT	Y offset of live feed
liveVideoScaler	0	scale of live feed
gridX	DISPLAY_WIDTH-	X offset of video grid
gridY	DISPLAY_HEIGHT	Y offset of video grid
gridScaler	0	scale of video grid
showRecent	FALSE	adds most recent video capture to screen
recentX	0,0,2000	X offset of recent video capture
recentY	0,0,2000	Y offset of recent video capture
recentScaler	0	scale of recent video capture
showTracking	FALSE	
scaler	1	scaler for grid of videos
originX	0,-1920,1920	X origin point of video grid
originY	0,-1500,1500	Y origin point of video grid
systemShutdownTim e	FALSE	
autoRecord	FALSE	
autoDuration	60,10,600	

Play

The table below shows the values for each GUI variable at the time of acquisition

Variable	value settings	description
videoSpeed	1,0,1	controls the speed of the video playback
minSpeed	0	minimum video playback speed
keyFrame	30,0,120	sets a keyframe in the video to play from?
keyFrameBuf	20,0,120	?
bLoopPalindrome	TRUE	loops the video forward and backward from keyframe, otherwise restarts

Rec

Variable	value settings	description
recSettingIndex	0,0,3	loads recording settings
recDuration	3,0	duration of recorded video
recFPS	30,1,90	fps of recorded video
minRecFrames	39,0,MAX_BUFFER_ SIZE	minimum number of frames to record
maxRecFrames	93,1,MAX_BUFFER_ SIZE	maximum number of frames to record
minRecPause	0,0,10	?
endTrim	22,0,120	trim the end of the recording back to the middle