Media Field Navigation

Selective Shared Immersive Reality Substitution

FORUM8 | World16

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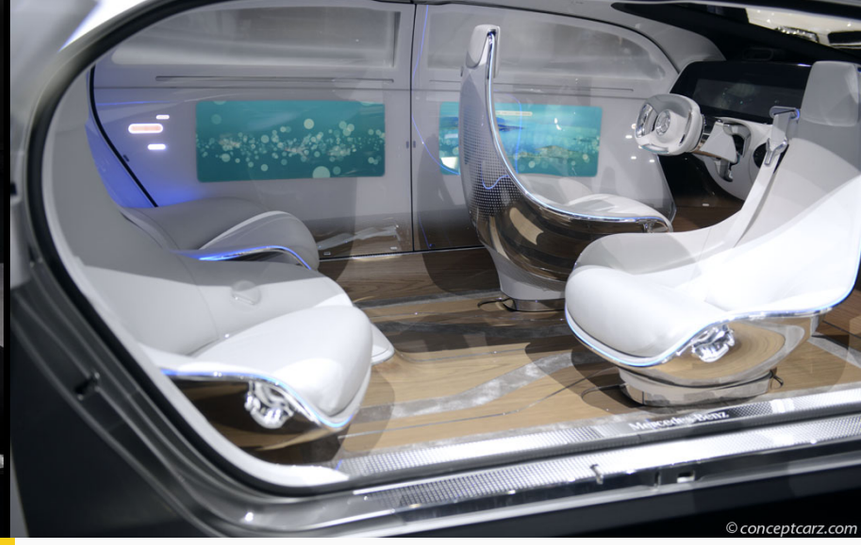
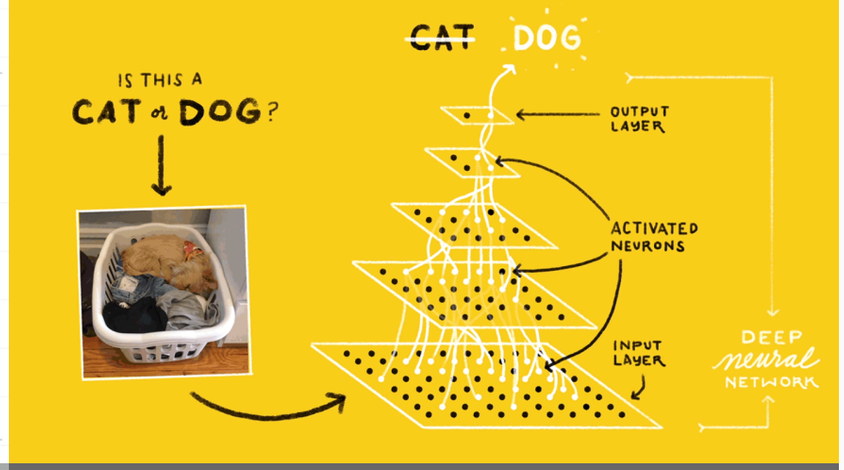
transLAB
MAT/UCSB

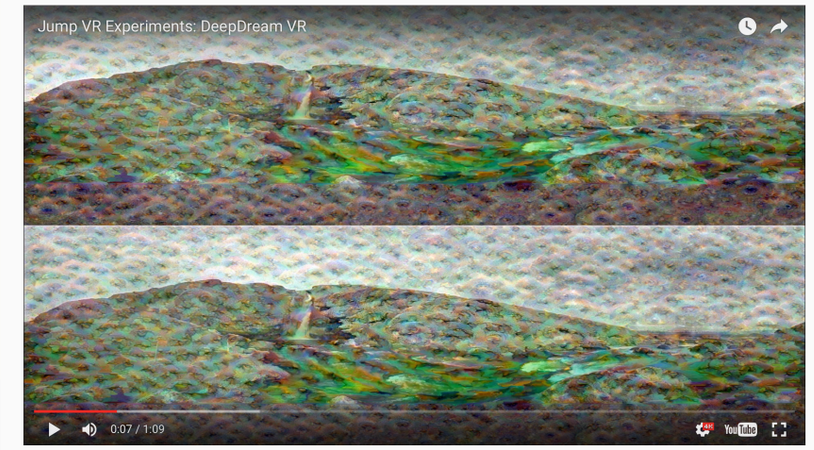
Tokyo
November 2016

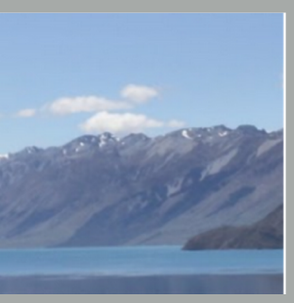
Overview

- MFN (Media Field Navigation): MFN refers to transportation as navigation through fields of information and media.
- SSIRS (Selective Shared Immersive Reality Substitution): SSIRS refers to the substitution of a selectively modified immersive reality in place of another, with the purpose of altering the original MFN.

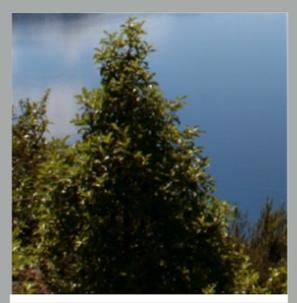






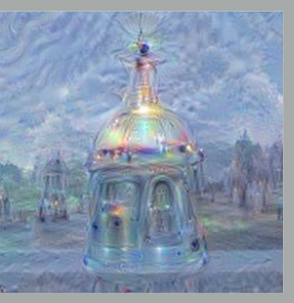


Horizon

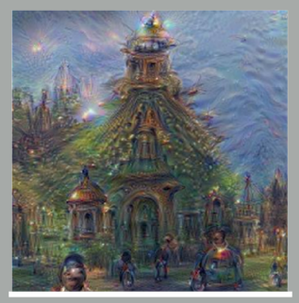


Trees

Leaves

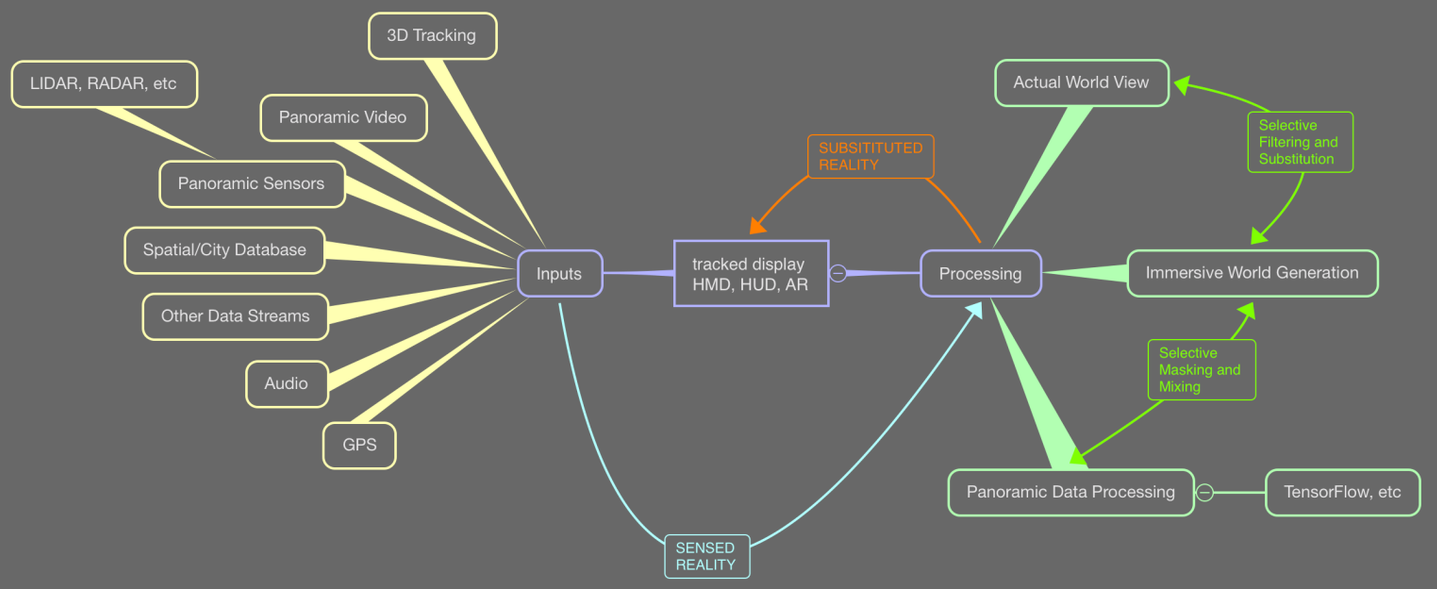


Towers & Pagodas



Buildings

Birds & Insects



Media Field Navigation

Selective Shared Immersive Reality Substitution

Pipeline: sources, processes, filters, shaders, outputs

- Sources -> sensors, video, simulation, databases
- Processes -> object and facial recognition, machine vision
- Filters -> 2D and 3D filters, neural nets, video, point clouds
- Shaders -> GPU shaders for real-time processing
- Outputs -> Screens, HUDs, HMDs, AR, MR, VR

Software: Mathematica, Deep Dreamer, Max, GPU Shaders

- Mathematica
- Deep Dreamer
- Max
- GPU Shaders

Mathematica

- Wolfram Language
- Computer Vision
- Image Identify
- FindFaces

Deep Dreamer

- Deep Dream Generator
- Computer Vision
- Image Identify
- FindFaces

Max

Real time video audio and video processing of input streams using matrix operators.

- jit.op

jit.op.maxhelp (unlocked)

100%

basic | operators | using multiple operators | ?

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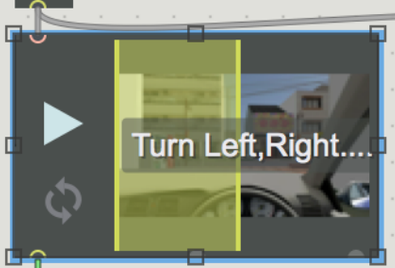

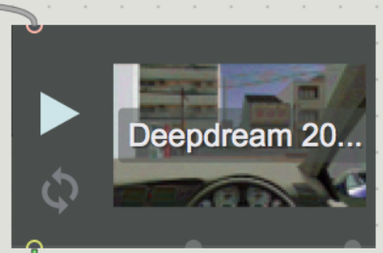

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jit.op @op * @val 0.5

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9.86103

fps

jit.pla...

Play video files

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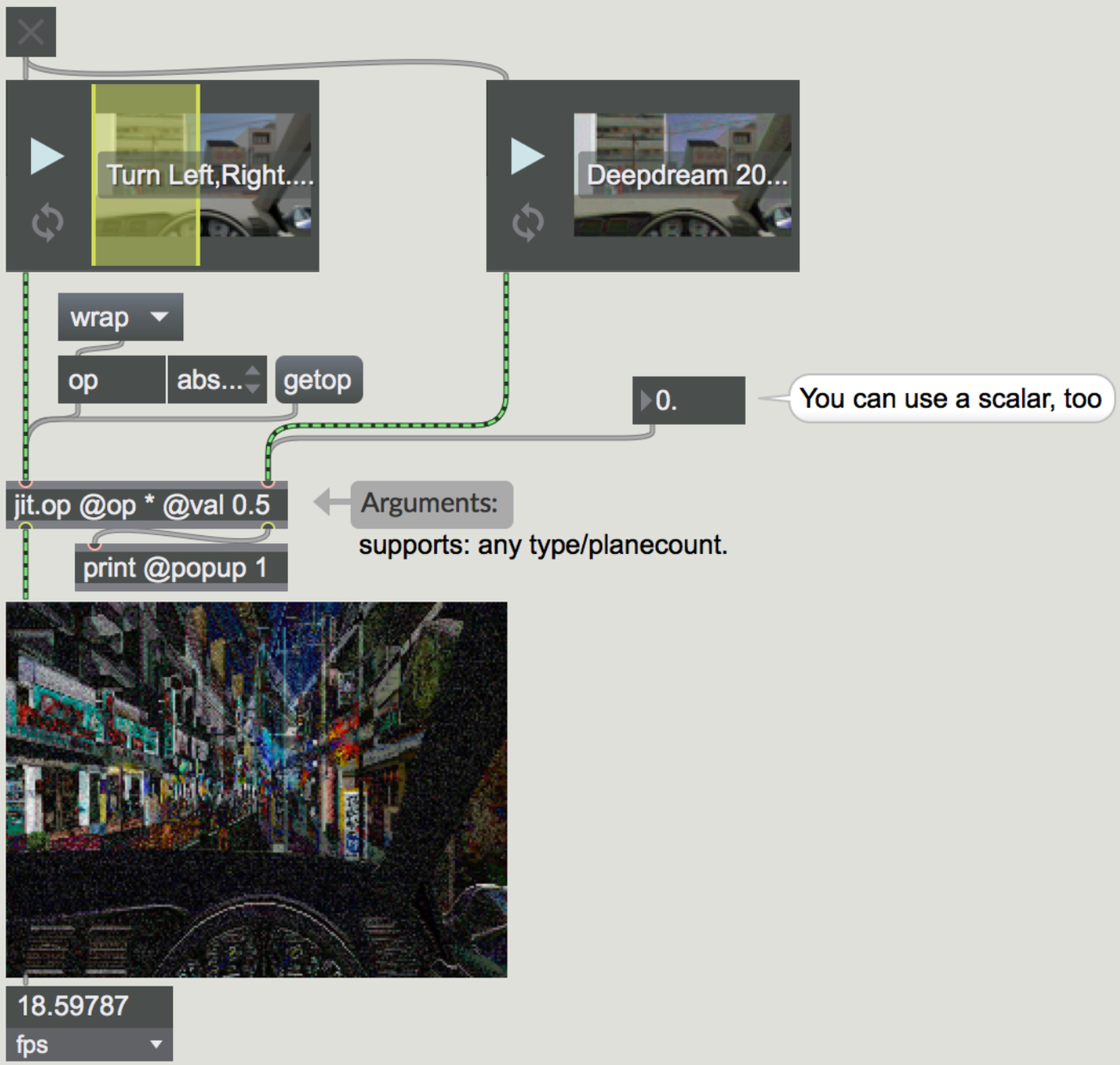

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GPU Shaders

Real-time manipulation via custom shaders applied during scene rendering and post-processing.

- OpenGL
- GLSL
- HLSL
- Metal
- others

MeshLab_64bit v1.3.3

Project_1

FOV: 60
FPS: 270.3

Mesh: Laurana50k.ply
Vertices: 27861
Faces: 49954
VC

MeshLab File Edit Filters Render View Windows Help

100% Thu 9:06 AM marcos

Project_1

Form

Uniform Variables | Textures | OpenGL Status | Vertex Program | Fragment Program

```
//Create uniform variables for lighting to allow user interaction
uniform float SpecularContribution;
uniform vec3 LightPosition;

varying vec3 MCPosition;
varying float LightIntensity;

void main(void)
{
   float diffusecontribution  = 1.0 - SpecularContribution;

   // compute the vertex position in eye coordinates
   vec3  ecPosition          = vec3(gl_ModelViewMatrix * gl_Vertex);

   // compute the transformed normal
   vec3  tnorm               = normalize(gl_NormalMatrix * gl_Normal);

   // compute a vector from the model to the light position
   vec3  lightVec            = normalize(LightPosition - ecPosition);

   // compute the reflection vector
   vec3  reflectVec          = reflect(-lightVec, tnorm);

   // compute a unit vector in direction of viewing position
   vec3  viewVec             = normalize(-ecPosition);

   // calculate amount of diffuse light based on normal and light angle
   float diffuse             = max(dot(lightVec, tnorm), 0.0);
   float spec                = 0.0;

   // if there is diffuse lighting, calculate specular
   if(diffuse > 0.0)
```

Close Shader

FOV: 60
FPS: 72.5

Mesh: Laurana50k.ply
Vertices: 27861
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VC

QUESTIONS

- what is “signal” and what is “noise”?
- how can we increase “signal” and reduce “noise”?
- what elements of the environment cannot be ignored?
- what elements of the environment can be modified?
- how can transitions between actual and modified be handled?

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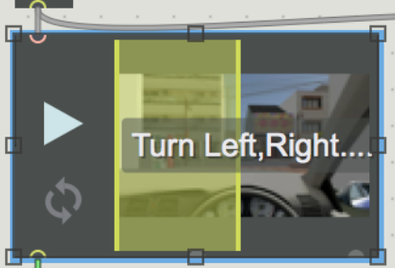

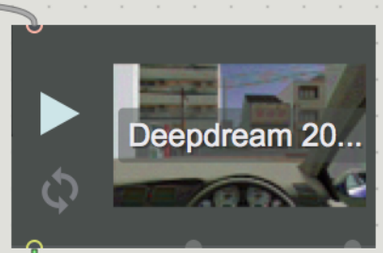

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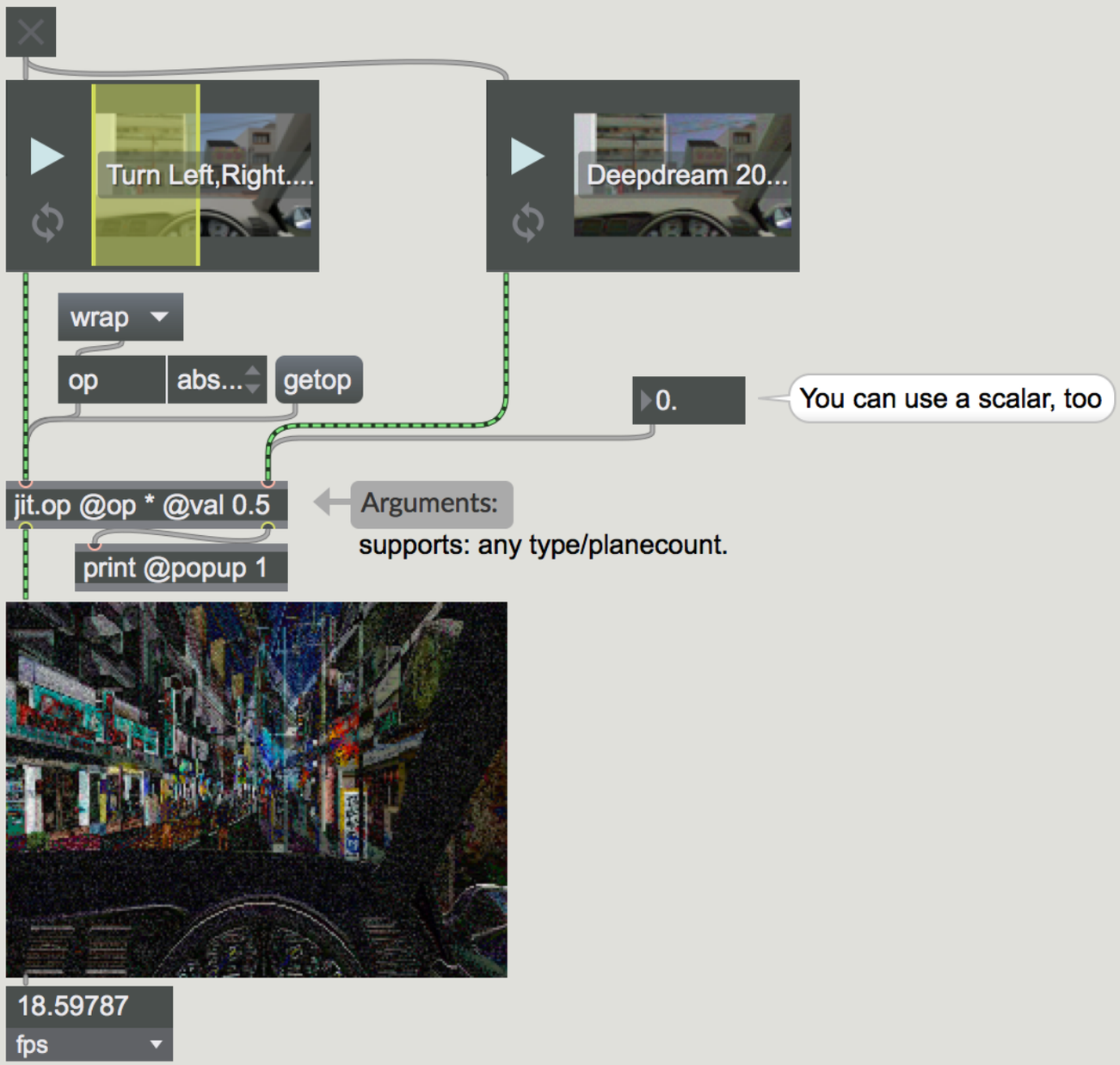

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QUESTIONS

- what is the range of possible expressions?
- how can expressions be triggered interactively?
- how would the environment react to several passengers?
- how would other media and information be overlayed?
- how could this approach operate on 3D point clouds in VR?

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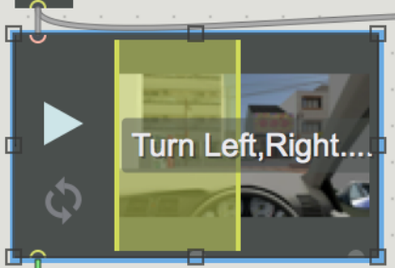

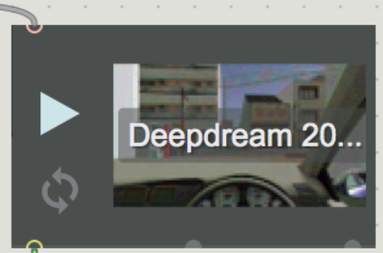

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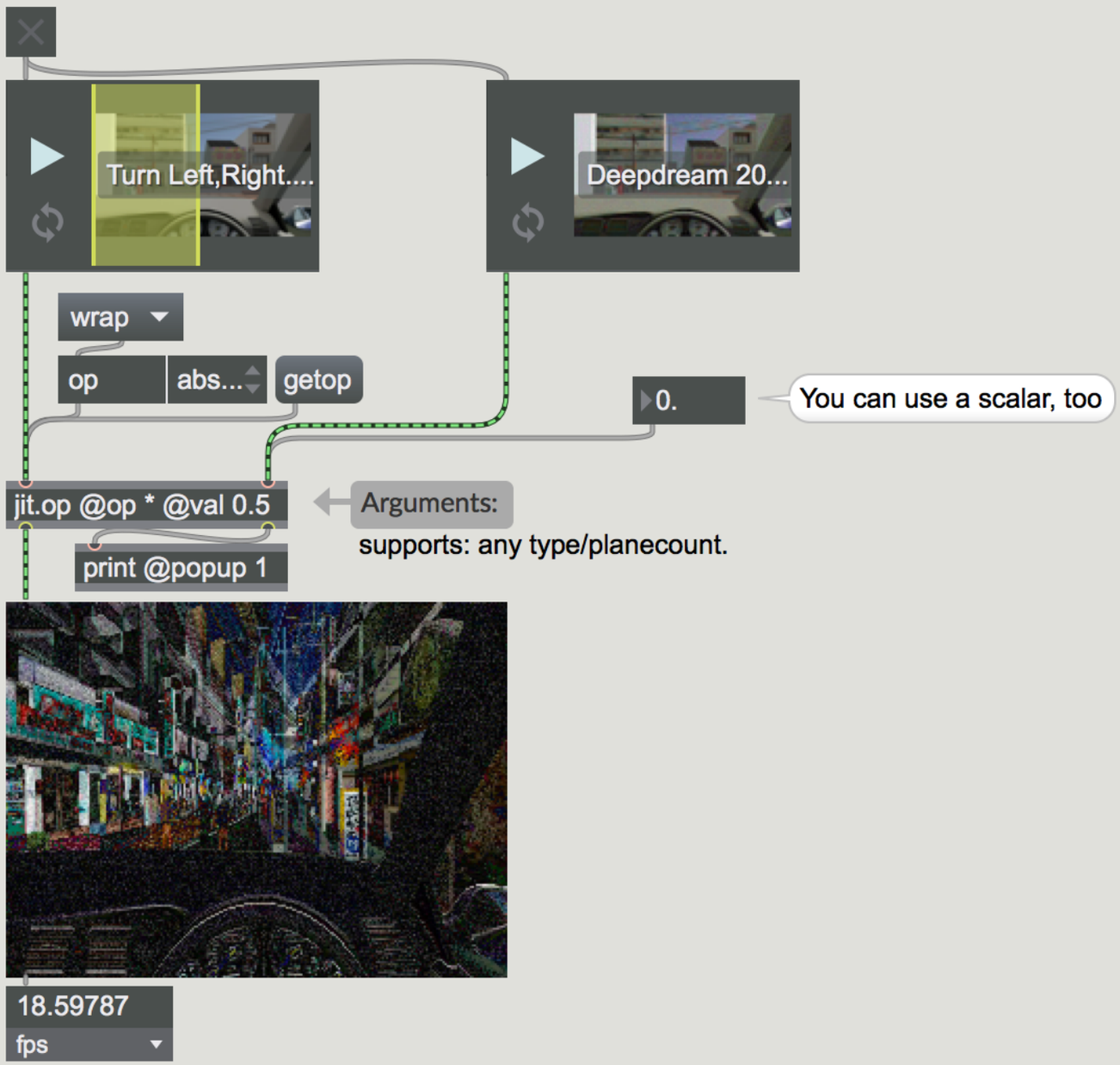

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▼ See Also

- playlist~ - Play sound files
- sfplay~ - Play audio file from disk
- waveform~ - buffer~ viewer and ...

Use jit.playlist to organize sets of video files and play them back. Each video is given a visual representation in a clip where a selection from the entire video file may be choosen. Clips may be dragged within a jit.playlist to re-order them, or they maybe

Media Field Navigation

Selective Shared Immersive Reality Substitution

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November 2016