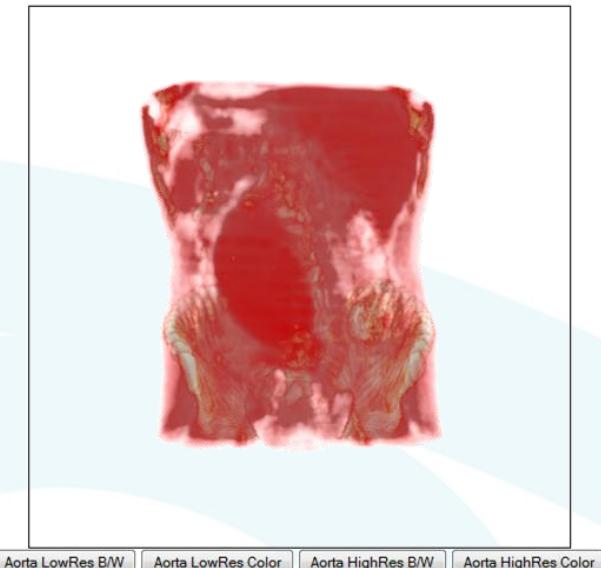


What we did last year... (Demo)

WebGL Volume Rendering

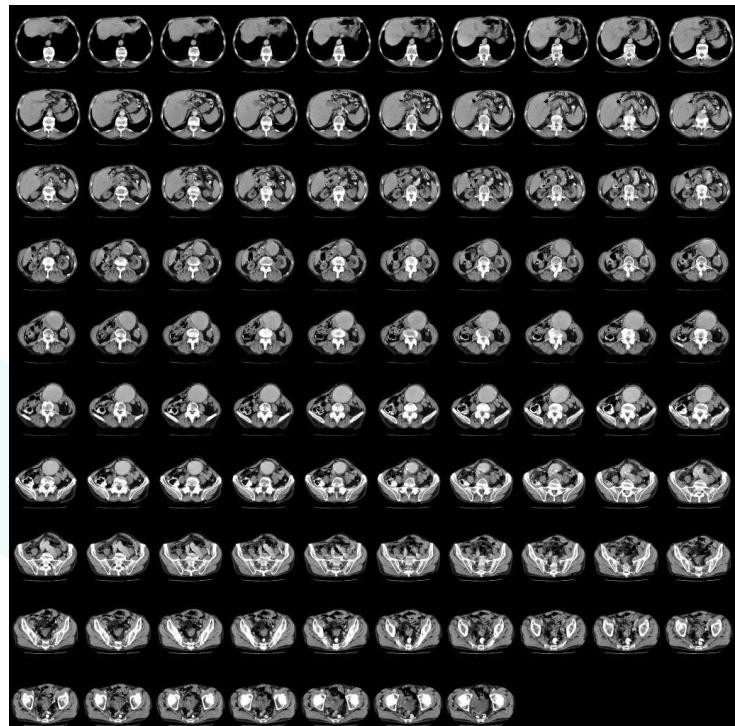
Real-Time Interactive Visualization of Volumetric Data with WebGL



Rotation with the mouse, and Alt+Mouse to Zoom

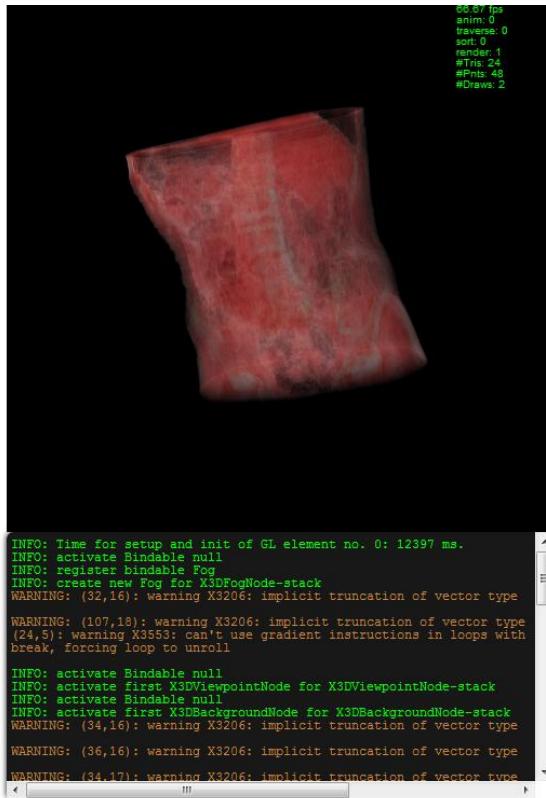
Abstract

The new WebGL standard may enable volume visualization on the Web. The Web is increasingly competing against desktop applications in many scenarios, but the graphical demands of some, such as interactive scientific visualization by volume rendering, have been a burden for their successful transition. Performance, scalability, accuracy, security are some of the many challenges that must be solved to see such visual Web applications emerge. In this publication, our intention is to demonstrate both performance and scalability of volume rendering by ray-casting based on the new WebGL standard in two different but challenging in different aspects fields: medical imaging and radar meteorology.



What we've been working on...

Integrating Volume Rendering in declarative X3DOM

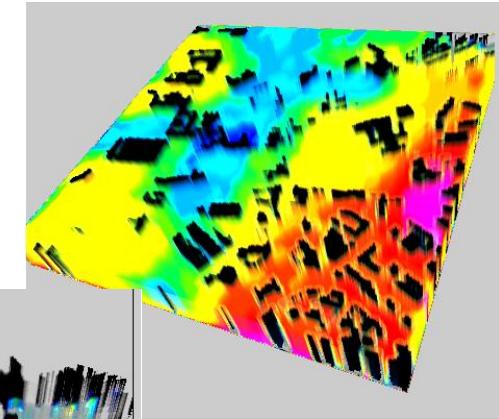
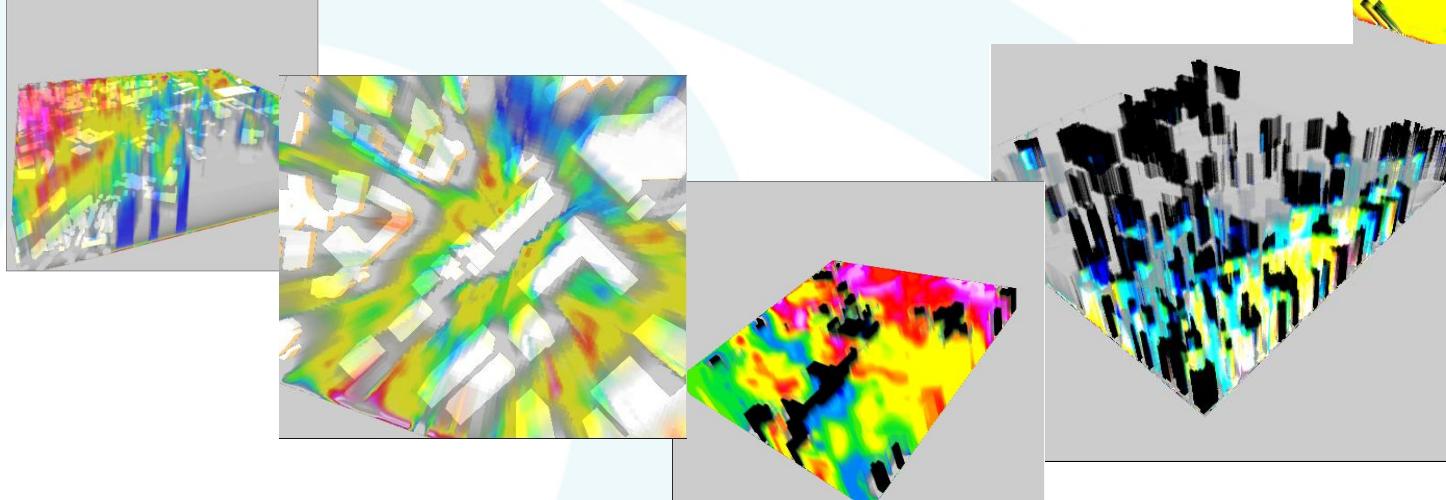


```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="X-UA-Compatible" content="chrome=1" />
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Hello World</title>
<link rel="stylesheet" type="text/css" href="x3dom.css" />
<script type="text/javascript" src="x3dom.js"></script>
</head>
<body>
<X3D xmlns='http://www.web3d.org/specifications/x3d-namespace' showStat='true' showLog='true' width='500px' height='500px'>
<Scene>
<Background skyColor='0.0 0.3 0.65'/>
<Viewpoint description='Default' zNear='0.0001' zFar='100'/>
<Transform>
<VolumeData id='volume' dimensions='4.0 4.0 4.0'>
<ImageTextureAtlas containerField='voxels' url='media/volume/aorta4096.png'numberOfSlices='96' slicesOverX='10' slicesOverY='10' />
<OpacityMapVolumeStyle lightFactor='0.01'>
<ImageTexture containerField='transferFunction' url='transfer.png' />
</OpacityMapVolumeStyle>
</VolumeData>
</Transform>
</Scene>
</X3D>
</body>
</html>
```

What we've been working on... (no demo yet)

And extending capabilities...

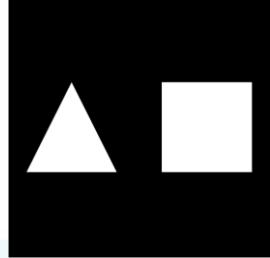
- 4D (timesteps volumes)
- Adding 3D models
- Realtime transfer function tuning with JQuery



What we've been working on...

WebGL Tutorials from C/C++ code

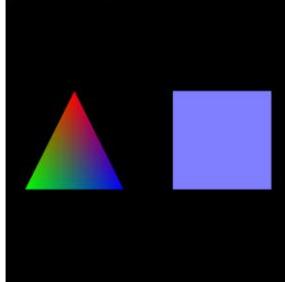
WtWebGL Lesson 1: A Triangle and a Square



This demo has been developed by Vicomtech-IK4 Research Center
Based on the learningwebgl.com lessons.

www.vicomtech.es

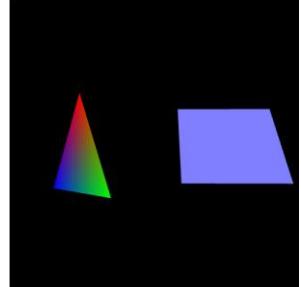
WtWebGL Lesson 2: Adding Colour



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Based on the learningwebgl.com lessons.

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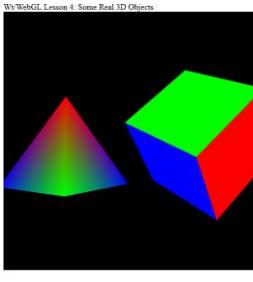
WtWebGL Lesson 3: A Bit of Movement



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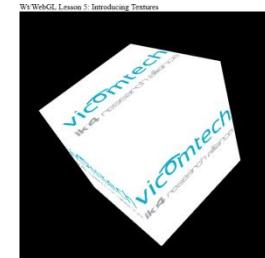
WtWebGL Lesson 4: Some Real 3D Objects



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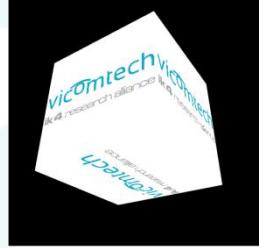
WtWebGL Lesson 5: Introducing Textures



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Based on the learningwebgl.com lessons.

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WtWebGL Lesson 6: Keyboard Input and Texture Filters



Rotate with up/down/left/right keys and zoom with page up/page down

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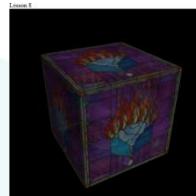
WtWebGL Lesson 7: Basic Directional and Ambient Lighting



Rotate with up/down/left/right keys and zoom with page up/page down
USE DIRECTIONAL
X: 0.05 Y: 0.20 Z: -10
LIGHT COLOR
R: 1.0 G: 0.5 B: 0.3
AMBIENT LIGHT COLOR
R: 0.2 G: 0.2 B: 0.2

This demo has been developed by Vicomtech-IK4 Research Center
Based on the learningwebgl.com lessons.

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Rotate with up/down/left/right keys and zoom with page up/page down
USE BLENDING
X: 0.05 Y: 0.20 Z: -10
LIGHT COLOR
R: 0.45 G: 0.85 B: 0.85
AMBIENT LIGHT COLOR
R: 0.52 G: 0.52 B: 0.52



Rotate with up/down/left/right keys and zoom with page up/page down
USE TWINKLE
X: 0.05 Y: 0.20 Z: -10
LIGHT COLOR
R: 0.00 G: 0.00 B: 0.00

This demo has been developed by Vicomtech-IK4 Research Center
Based on the learningwebgl.com lessons.

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WtWebGL Lesson 11: Spheres, Rotation Matrices and Mouse Events



Rotate with mouse and zoom with scroll

LIGHT DIRECTION
X: -10 Y: -10 Z: -10
LIGHT COLOR
R: 0.45 G: 0.55 B: 0.05
AMBIENT LIGHT COLOR
R: 0.52 G: 0.52 B: 0.52

This demo has been developed by Vicomtech-IK4 Research Center
Based on the learningwebgl.com lessons.

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WtWebGL Lesson 12: point lighting

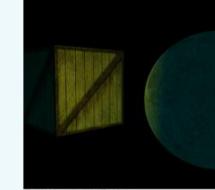


Rotate with mouse and zoom with scroll
USE LIGHTING
X: 0.05 Y: 0.05 Z: -0.05
LIGHT COLOR
R: 0.45 G: 0.55 B: 0.05
AMBIENT LIGHT COLOR
R: 0.52 G: 0.52 B: 0.52

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WtWebGL Lesson 13: per fragment lighting and multiple programs



USE FRAGMENT LIGHTING
X: 0.05 Y: 0.05 Z: -0.05
LIGHT SOURCE LOCATION
X: 0.05 Y: 0.05 Z: 0.05
LIGHT COLOR
R: 0.45 G: 0.55 B: 0.05
AMBIENT LIGHT COLOR
R: 0.52 G: 0.52 B: 0.52

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WtWebGL Lesson 14: specular highlights and looking a model



ROTATE WITH MOUSE AND ZOOM WITH SCROLL
USE SPECULAR MAP
X: 0.05 Y: 0.05 Z: -0.05
LIGHT SOURCE LOCATION
X: 0.05 Y: 0.05 Z: 0.05
LIGHT COLOR
R: 0.45 G: 0.55 B: 0.05
SPECULAR LIGHT COLOR
R: 0.45 G: 0.55 B: 0.05
AMBIENT LIGHT COLOR
R: 0.52 G: 0.52 B: 0.52

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WtWebGL Lesson 15: Specular Highlights

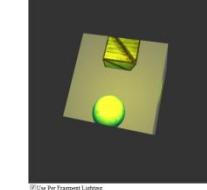


ROTATE WITH MOUSE AND ZOOM WITH SCROLL
USE SPECULAR MAP
X: 0.05 Y: 0.05 Z: -0.05
LIGHT SOURCE LOCATION
X: 0.05 Y: 0.05 Z: 0.05
LIGHT COLOR
R: 0.45 G: 0.55 B: 0.05
SPECULAR LIGHT COLOR
R: 0.45 G: 0.55 B: 0.05
AMBIENT LIGHT COLOR
R: 0.52 G: 0.52 B: 0.52

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WtWebGL Lesson 16: Rendering to textures



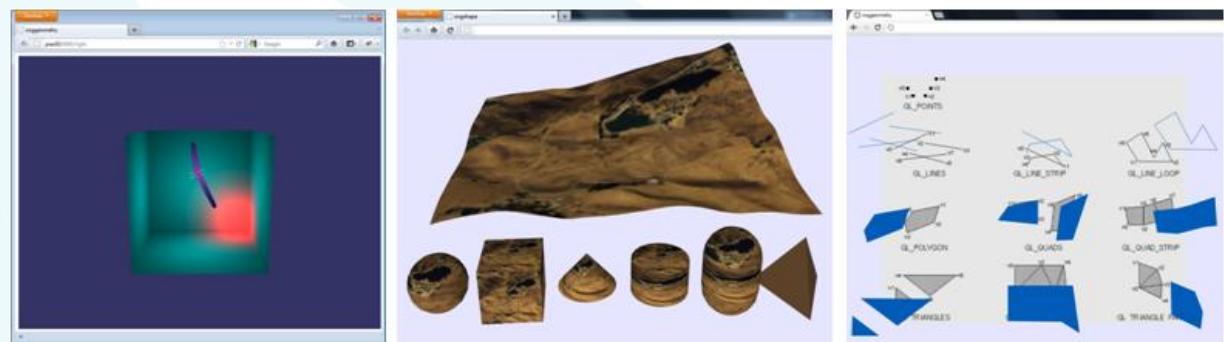
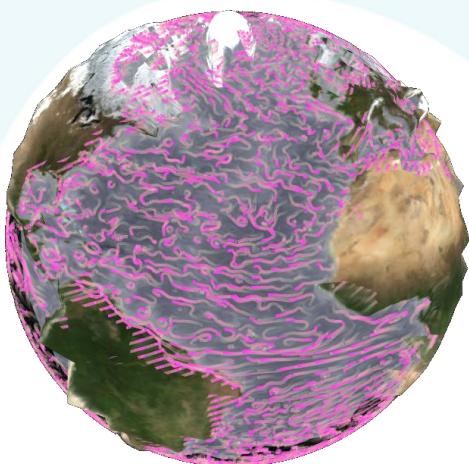
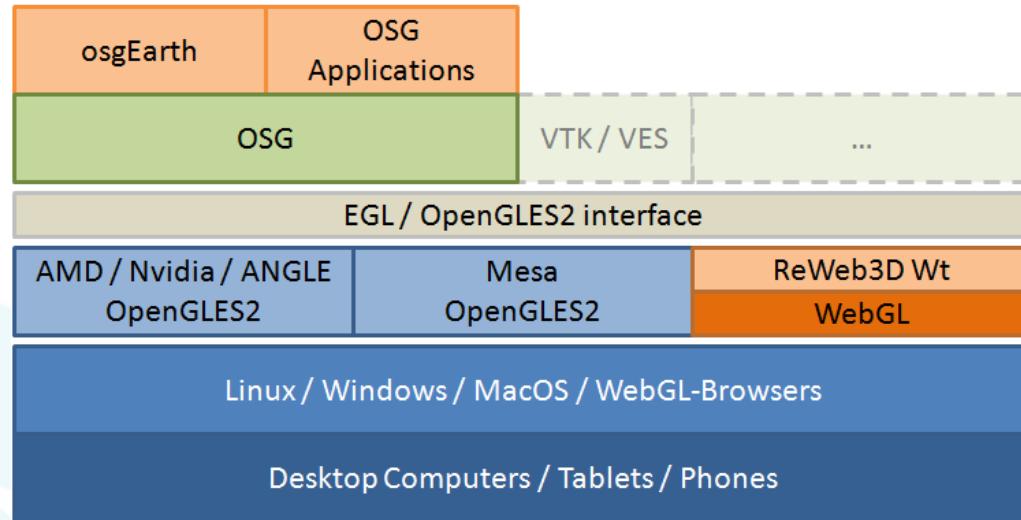
USE PER FRAGMENT LIGHTING
X: 0.05 Y: 0.05 Z: -0.05
LIGHT SOURCE LOCATION
X: 0.05 Y: 0.05 Z: 0.05
LIGHT COLOR
R: 0.45 G: 0.55 B: 0.05
AMBIENT LIGHT COLOR
R: 0.52 G: 0.52 B: 0.52

This demo has been developed by Vicomtech-IK4 Research Center
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How it works? + Demo

OpenGL ES 2.0 to WebGL/OSG (ReWeb3D)



Keep updated!

<http://demos.vicomtech.org>

<http://www.volumerc.org>

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Glander, Esther Novo,...

Myself: Luis Kabongo