

Visualizing Energy Flowage in 3D with Kinect and Head-Up Display in
Unity

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1. Visualizing Energy Flow in 3D with Kinect

Tai Chi - Chinese martial art

Focus on state of mind, control energy in body with slow movement

Optimize internal energy with meditation

Calligraphy performance

Black ink and brush stroke are the reflection of body movement.

Controlling huge brush is a result of demanding training.



http://www.clien.net/cs2/bbs/board.php?bo_table=park&wr_id=27226769

2.1 Kinect V2

Mirror Image



<https://whatshisaid.com/2014/03/27/the-mirror-image-illusion/>

2. Head Up Display (Oculus - DK2)



Environment

Windows 10, i7 - AMD M275
2G, 12G Ram.

Oculus 0.4.3 SDK

Plugin for Unity 5.0 v1.3.0

<https://www.oculus.com/en-us/blog/announcing-the-oculus-rift-development-kit-2-dk2/>

3. Process

Using Kinect V2 - tracking hands movement in Unity

Skeleton Tracking System

[Kinect for Windows V2](#)

<https://developer.microsoft.com/en-us/windows/kinect/tools>

<http://www.imaginativeuniversal.com/blog/post/2015/03/27/unity-5-and-kinect-2-integration.aspx>

4. Process

Generate lines of both hands' path

[Unity Trail Renderer](#)

<http://docs.unity3d.com/Manual/class-TrailRenderer.html>

Get transform position of both hands and attach the trail renderer to them

5. Process

Converting that path to 3D forms that represent speed of the movement

1. Projectile

1.1 Get vectors directions of both hands in every second

1.2 Get distance between both hands to belly button

1.3 If the distance is more than designated number the hands shoot

Fireballs based on the vector directions

1.4 Speed is also calculated in each second, it multiplies to the projectile

6. Process

Mounting HUD to the skeleton.

1. All the kinect library supposes that the user watch the mirrored image.

Thus, all the orientation through HUD was reversed.

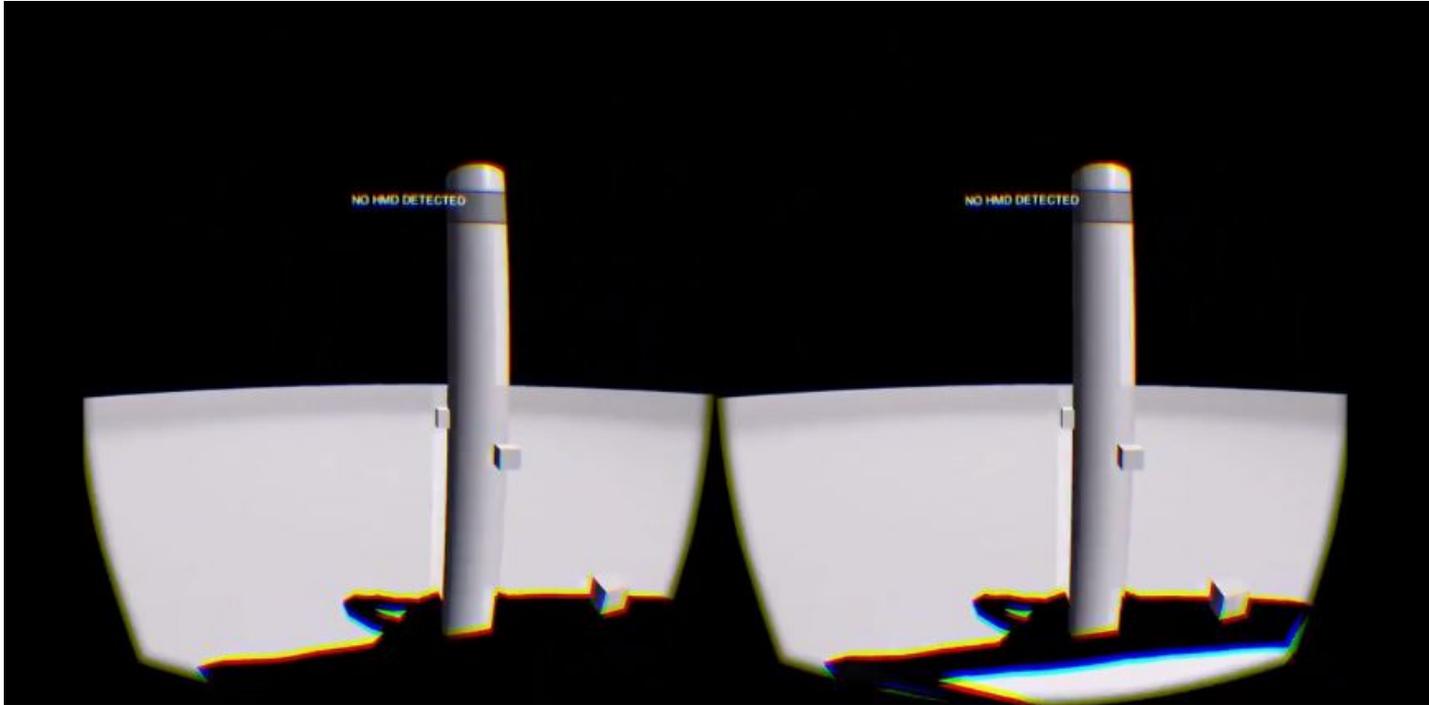
2. Change orientation and scale down the skeleton to enhance visualization effect. (HUD is actually attached to pelvis)

7. Process

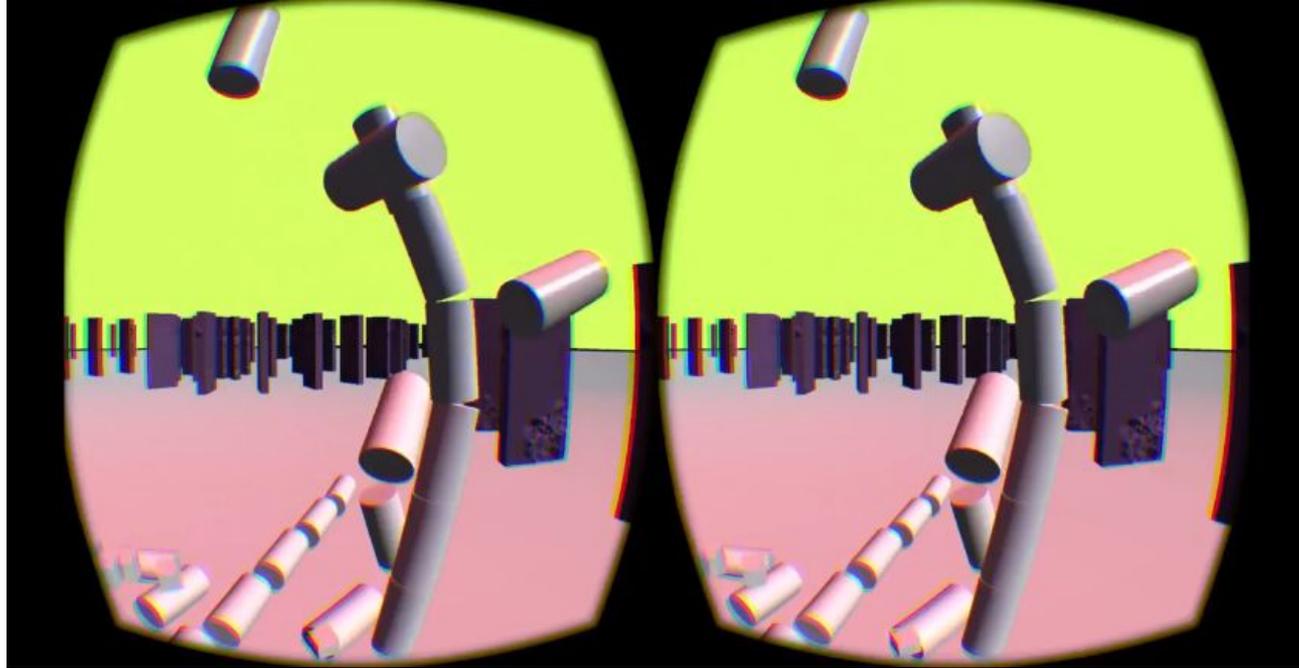
Using Oculus, the program allows a player to see their energy as 3D forms.

Also, create background effect.

Scene 1. Virtual Calligraphy



Scene 2. Virtual Physics



Scene 3. Virtual Energy



8. Result and Future work

Kinect real time rigging - mapping a model into the skeleton.