Vireio Perception v4 Alpha 3

User Manual

Vireio Perception: Open-Source Stereoscopic 3D Driver
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Vireio Perception Version History:
v1.0.0 2012 by Andres Hernandez
v1.0.x 2013 by John Hicks, Neil Schneider
v1.1.x 2013 by Primary Coding Author: Chris Drain
Team Support: John Hicks, Phil Larkson, Neil Schneider
v2.0.x 2013 by Denis Reischl, Neil Schneider, Joshua Brown
v2.0.4 to v3.0.x 2014-2015 by Grant Bagwell, Simon Brown and Neil Schneider
v4.0.x 2015 by Denis Reischl, Grant Bagwell, Simon Brown, Samuel Austin and Neil Schneider

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1 – About

2 – Version 4: A new Architecture

NOTE: Vireio v4 is a new architecture while v3 architecture is still present and working. Start "Perception_v3.exe" for Vireio v3, "Perception_Win32.exe" or "Perception_x64.exe" for Vireio v4. The configuration for v3 is found in "//perception//cfg" folder, for v4 it is located in "//perception/cfg_v4" !!

2.1)   What's new ?

– The Vireio Cinema : play any DX9 or DX11 game on big screen in a VR Cinema (DX9 not finished yet)
– Vireio Cinema Stereo game profiles : play 3rd Person or Point'n'Click games in Stereo in the Vireio Cinema as if you would watch a 3D Movie
– Full Immersive Game Profiles : switch from Game Cyberspace to the Vireio Cinema and back in gameplay for 1st Person games
– Virtual Cinema Hall build by Senior Game Artist Oliver Reischl
– Virtual Gaming Room including various great fx from shadertoy.com.. build and customize your game-specific Virtual playing space
– HTC Vive Controller support: full Mouse (laser pointer) and Keyboard emulation... customize any Controller button setting game-specific... Controllers rendered in your VR playing space

3 – Game Profiles

ALPHA 3 RESTRICTIONS: For Vireio v4 Alpha 3 DX9 support is not finished yet. And for Alpha 3 you can only create your own mono cinema profiles, eventually we will release "Aquilinus – 3D Modification Studio", the tool to let you also create stereo profiles. And the cinema hall is also not finished, only the gaming room is available. Steam thumbnail URLs not working now. This all will come with the eventual release of the driver !

Vireio Perception v4 supports Direct3D games, D3D version 9 and 11. Version 4 of the Driver now has unique game profiles, that means you have to choose the profile you want to inject to your favorite game.

Each game profile is listed in "//perception//cfg_v4//profiles.xml". You can add your own game processes to that list, we describe that at the end of this chapter.

Basically Vireio v4 has 3 stages of support for a game : Mono Cinema, Stereo Cinema and Full Immersive.

3.1 - The Vireio Cinema
For the new architecture of the Driver Senior Game Artist Oliver Reischl has built a huge Cinema Hall in 3D. This is the base for the new Vireio Cinema.
Beside that new Cinema Hall we also provide a simple VR Gaming Room that comes with enhanced pixel shader fx from shadertoy.com.
Choose to play your games either in the Cinema Hall or in the Gaming Room. Both places are fully customizable, set the sizes and choose the shader fx per-game in the VireioPerception.ini file.
In Mono Cinema stage you can play any DX9 and DX11 game in a VR Cinema. Simply add your desired game to the list in "//perception//cfg_v4//profiles.xml", if no unique game profile is added to the game in that list Vireio will automatically load the standard mono cinema profile for your chosen HMD.
3.2 - Stereo Cinema Profiles
In Stereo Cinema stage you can play certain DX9 and DX11 games in stereo in a VR Cinema. Choose the game profile in "//Perception//game_profiles//cinema".
Remember to use "Perception_Win32.exe" for 32bit profiles, "Perception_x64.exe" for 64bit profiles.
Stereo Cinema profiles are especially for Point'n'Click, 3rd Person or Top-Down camera games, they do not have options to take control over the in-game camera.
3.3 - Full Immersive Game Profiles
The third stage, Full Immersive, now also starts in the Vireio Cinema. That means as long as the gameplay does not start (intro, game menues,..etc) you are in the cinema. Once the gameplay start you can instantly "warp" into game cyberspace and play the game having full head and position tracking done by Vireio Percpetion (VRBoost). Switch back to the Cinema whenever you need to go through menues or sort your inventory or whatever can be done easier there.

If you now want to add own games to the game profile list please fill in following xml attributes:

game_name   The name of the game to be shown in the Vireio selection box.

game_exe	The exact name of the game process executeable.
cpu_architecture	The architecture of the game process, either "32bit" or "64bit".
dx_version	The DX version ("11" for D3D11). If no DX version is provided Vireio assumes DX9.
image_url	The url of a steam thumbnail image (184x69 pixels)
time_delay	The delay, in miliseconds, before Vireio fully gets active in the game process.
repetition	The number of injection repetitions. Some games need a second injection.
profile_path	The path to the unique game profile. Note that the keyword "HMD" must be present, it will be replaced by the chosen HMD api name. If no unique profile is available for that game Vireio will load the standard mono cinema profile.

4 - How to load and inject a Game Profile

NOTE: "Perception_v3.exe" is Vireio Perception v3, this is not described here !!

Before you start to inject, please setup the choosen game for Vireio Perception : Disable any overlay or recording software. Tools like "FRAPS" work in a very similar way like Vireio v4 so both cannot work together. If you want to record your gameplay you can try to start these tools after the game has started using Vireio.

Full list of known incompatible software:
- Steam Overlay
- Steam Desktop Game Theatre
- FRAPS

IMPORTANT NOTE: Always (!) turn off V-Sync in your game settings. This can give huge performance boost for Vireio Perception.

For the mono cinema profiles please read the section about the Vireio Cinema (section 3.1).

Commonly the games launcher, if present, should be loaded before you load a unique game profile using Vireio. Start "Perception_Win32.exe" for 32bit games and "Perception_x64.exe" for 64bit games. Select your desired game and your HMD api. (OSVR for Razer HDK, OpenVR for HTC Vive, LibOVR for Oculus Rift) Press the big "profile" button, it's border should now switch to yellow. Start the game. The border around the profile button should get green once the profile is injected.

Please read section Troubleshooting (7) if this does not work. You can close the Vireio Perception app once the border turned to green.

NOTE: You can also try to play OpenVR profiles on OSVR and LibOVR devices, this is not tested now !

If your desired game has an inbuild benchmark tool please write down your benchmark result first without Vireio, then with Vireio Mono Cinema and eventually with the unique game profile, if present. Please post some of your results in the official Vireio Perception forums on MTBS3D to help us improve Vireio !!

5 - The VireioPerception.ini file

For every game you play using Vireio Perception the Driver will create an init file called "VireioPerception.ini" at first startup. Here you can customize the Vireio Cinema and change all options for Vireio and your choosen HMD.

Here is a full list of all basic parameters, for HMD specific parameters please read next chapter "Supported HMDs and Controllers" :

Pixel shader fx from shadertoy.com :

Cinema screen:

Top/Bottom floor:

Front/Back/Left/Right wall:

6 - Supported HMDs

    6.1)   HMDs

    6.1.1) Oculus Rift – LibOVR

For Oculus Rift you do not need to copy dlls. Start Oculus Home and inject your chosen game profile as described.

Do not forget to disable Steam Overlay. (Steam->Library->Game->Properties)

In some cases games crashed at startup when the Oculus tracker initialized. Add a time delay to your chosen game profile in that case (see "time_delay" in Chapter "Game Profiles" (3)).

In the "VireioPerception.ini" file you can set following [LibOVR] parameters :

afPositionOrigin[0..2]   -> X..Z Origin of your tracking device
bShowMirror   -> Hotkey VK code (string) to syncronize yaw angle.

    6.1.2) HTC Vive – OpenVR

For HTC Vive (or SteamVR) you need to copy "openvr_api.dll" from "//Steam//SteamApps//common//bin" to your games executeable folder.

NOTE : Choose the 32bit subfolder for 32bit games, the 64bit folder for 64bit games !!

Locate the game executeable (f.I. "//Program Files (x86)//Steam//SteamApps//common//Batman Arkham City GOTY//Binaries//Win32//" for "BatmanAC.exe") and copy the file.

Before you start Vireio Perception and the chosen game SteamVR must be started and running. Do not forget to disable Steam Desktop Game Theatre and the Steam Overlay. (Steam->Library->Game->Properties) Confirm "Ok" on the small warning

screen : "{Game} does not support VR. It will appear on your desktop and may affect VR performance."

In the "VireioPerception.ini" file you can set following [OpenVR] parameters :

6.1.3) Razer HDK – OSVR

NOTE : Unfortunately we faced some troubles regarding OSVR and Vireio. We hope for the help of the community here, it works on developers PCs (NVidia + AMD).

For OSVR devices you need to copy a handfull of dlls from your OSVR server folder to your games executeable folder.

NOTE : Use 32bit runtime dll files for 32bit games, 64bit files for 64bit games !!

Locate the game executeable (f.I. "//Program Files (x86)//Steam//SteamApps//common//Batman Arkham City GOTY//Binaries//Win32//" for "BatmanAC.exe") and copy following files:

– glew32.dll
– osvr*.dll
– SDL2.dll

If that does not work please also try to copy "d3dcompiler_47.dll".

Do not forget to disable Steam Overlay. (Steam->Library->Game->Properties)

In the "VireioPerception.ini" file you can set following [OSVR] parameters :

afPositionOrigin[0..2]	-> X..Z Origin of your HMD
nHotkeySync	-> Hotkey VK code (string) to syncronize yaw angle.
Emethod	-> 1...use DX11 game device
	-> 2..create own DX11 device
bUseHotkeyF11	-> 0...instantly start direct mode
	-> 1...start direct mode by pressing F11

6.2)   Controllers

6.2.1) HTC Vive Controller – OpenVR

NOTE: We also plan to add Xbox Gamepad emulation for the HTC Vive Controllers but cannot promise to have that finished soon.

Starting any Vireio Perception game profile on OpenVR you will see that the driver renders both HTC Vive Controllers and Tracking Base Stations.

Use your HTC Vive controller N° 0 as a mouse laser pointer on the cinema screen. And you can fully setup your HTC Vive controller buttons and axis to emulate keyboard and mouse button input for any game profile.

Customizing the HTC Vive Controller to your own needs can be as extensive as customizing the Steam Controller.

For the trackpad you can customize both axis directions pressed and unpressed and you can assign a hotkey for just pressed.

In the "VireioPerception.ini" file following [OpenVR] parameters are relevant for the HTC Vive Controllers:

aaunKeys[0..1]	-> Controller index 0/1
[Index_EButton_System]	-> Button >System<
[Index_EButton_ApplicationMenu]	-> Button >Menu<
[Index_EButton_Grip]	-> Button >Grip<
[Index_EButton_Axis0]	-> Button >Trackpad<
[Index_EButton_Axis1]	-> Button >Trigger<
[Index_EButton_Axis0_Below_X]	-> Button >Trackpad X Axis- Touched< Set this to WM_MOUSEMOVE to get the whole trackpad to emulate the mouse
[Index_EButton_Axis0_Above_X]	-> Button >Trackpad X Axis+ Touched<
[Index_EButton_Axis0_Below_Y]	-> Button >Trackpad Y Axis- Touched<
[Index_EButton_Axis0_Above_Y]	-> Button >Trackpad Y Axis+ Touched<
[Index_EButton_Axis0_Below_Pressed_X]	-> Button >Trackpad X Axis- Pressed<
[Index_EButton_Axis0_Above_Pressed_X]	-> Button >Trackpad X Axis+ Pressed<
[Index_EButton_Axis0_Below_Pressed_Y]	-> Button >Trackpad Y Axis- Pressed<
[Index_EButton_Axis0_Above_Pressed_Y]	-> Button >Trackpad Y Axis+ Pressed<
aafAxisScopeOrFactor[0..1][0]	-> Controller index 0/1 Axis index 0 = Trackpad For Button mapping this is the inner scope whithout events. (default = 0.8) For Mouse emulation (WM_MOUSEMOVE set) this is the factor the trackpad finger movement will be multiplied to mouse movement. Set this negative to invert an axis. (default = 10.0)

LINK: https://msdn.microsoft.com/enus/library/windows/desktop/dd375731(v=vs.85).aspx for a list of virtual keyboard codes, for mouse emulation set WM_MOUSEMOVE

7 – Troubleshooting

It may seem to some of you that v4 of the driver is not as stable as v3 but that is not true. Once we know all possible causes of profiles not injecting we're sure that the new, unique profiles for v4 are the better solution at all.
We know that dll injection can be hard the first time but hope to improve and ease up that in future.

Q: Game profile not working, game crashes.

First try to restart your HMDs api server or service.

Try to set a time delay in "//cfg_v4//profiles.xml" : Set "time_delay" to "10000" for 10 seconds delay.

Please post in the official forums if the problem persists. We know that there are still troubles on OSVR for unknown reason and hope for the help of the community to solve this.

Q: Game profile not working, game works as usual.

Q: Game profile not working, game does not start.

You may have forgot to copy the dlls to the games executeable folder. Dll copy is needed for OpenVR and OSVR. Please read "Supported HMDs and Controllers" (6).

Q: Game crashed, driver won't work again.

In this case the game process is still running, start the task manager and end the game process.

Q: Performance is bad / worst.

Important : disable Vsync !!

Start benchmark tests in games with and without Vireio. For the mono cinema you should only face max. 10% performance loss, for unique game profiles there should only be max. 35% performance loss.

Please try several game profiles in the mono cinema and compare performance for different games. We know that the intel threading classes some games use (tbb.dll) can impact performance for HMD libraries.

Q: Fallout 4 works but left image is screwed up.

Turn off "Depth of Field" using the Fallout 4 tweaker. This setting sometimes changes back to default "on", so you need to turn it off again.

8 – Supported Games: Instructions

Batman: Arkham City (Stereo Cinema Profile)

1) Ensure the game runs in DX11, not in DX9 : go to BatmanLauncher->Settings and enable all DX11 settings. (there are two DX11 settings, enable both) Game window name now should be "Batman: Arkham City (32-bit, DX11)".

2) Disable V-Sync !!

3) This is a very early game profile for Alpha 3, so shadows are broken now for stereo, disable

them. Other graphical flaws also still left due to stereo separation (mirrors, wall paintings, some geometry)

4) Load the stereo cinema profile for this game and your HMD, click "play" on your Steam library page.

5) This game is 32bit, please use "perception_win32.exe". Don't forget to copy dlls for OSVR and OpenVR.

TotalWar: Rome2 (Stereo Cinema Profile)

1) Load the TotalWar-Launcher, start "perception_win32.exe" and load the cinema profile accordingly to your HMD. Start the game.

2) To use the mouse laser pointer on the right location the game must run in fullscreen.

3) Start the "Rome2" benchmark. For best VR experience you should get 90 fps. If you do not get this even on low settings consult the Vireio forums on MTBS3D.

4) NOTE: (OSVR) For OSVR we unfortunately got bad performance here. Rome2 had always a bad framerate, with and without Vireio, whenever the OSVR server was running. We guess this comes since Rome2 use the "tbb" threading classes (file tbb.dll) and this threading classes do not incorporate with OSVR. Please post on the Vireio or OSVR forums if you find a solution to this.

Known not working games

Civilization V
Metal Gear Solid V