SRWorks v0.9.0.3

1. Support VIVE Cosmos HMD.
2. SRWorks achitecture changes to runtime service(in pre-version SRWorks is library SDK).
3. SeeThrough data transmission is changed through GPU pipeline instead CPU previously.
4. Improve 3D reconstruction denoise feature.
5. Unreal Experience add new scene
   - Portal
   - AI Vision(chair segmentation)

SRWorks v0.8.5.1 (2019/8/16)

1. Support COSMOS HMD.
2. Fix crash with 3D reconstruction trying to scan a large area.
3. Fix an issue with 3D reconstruction where it can't create 3D data for two disconnected area.
4. Fine tune 3D reconstruction performance for COSMOS.
5. Unity Experience: only need to push joystick left/right for rotary menu selection.
6. Unity Experience: enable camera pose synchronization to stabilize the drift between real and virtual object during head movement.

SRWorks v0.8.5.0 (2019/6/28)

Changes:

1. Supports NVidia RTX-20XX series
2. Supports **SteamVR input** with SteamVR Unity plugins 2.0.1
3. Supports 3D mesh loading without saving model file after 3D reconstruction
4. Performance tuning for AI.Vision and removes CPU mode
5. Replaces deprecated **Registry** class in Unity plugin with **PlayerPrefs**
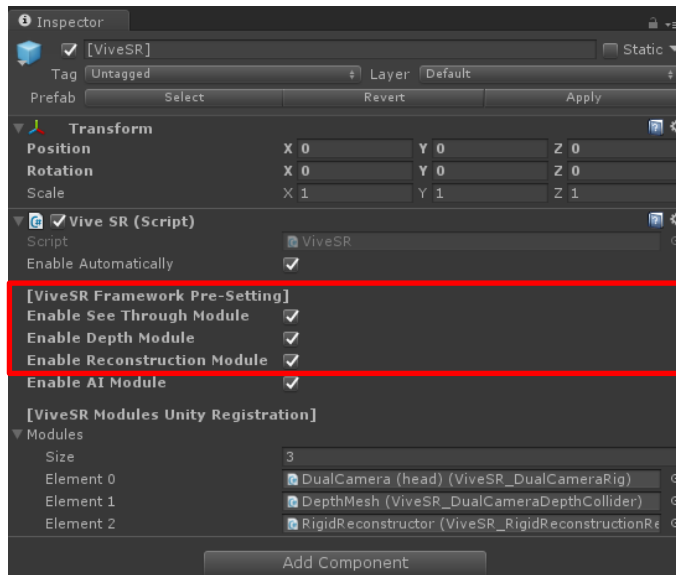6. Requires Unity 2017.4.17 or later

Known issues:

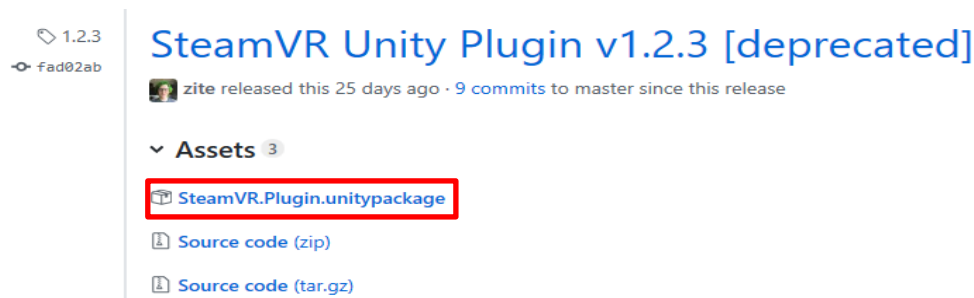[Experience Unity] Not support Unity 2018.3

SRWorks v0.8.0.2 (2018/11/08)

Changes:

1. Fix crash problem with OpenVR shutdown in Unity.
2. Fix crash problem with SRWorks framework restarting in Unity and Unreal.
3. Added the options to initialize individual modules in the Unity inspector.

4. This version doesn't support SteamVR unity plugins 2.0.1, please download **SteamVR unity plugins 1.2.3 package** (https://github.com/ValveSoftware/steamvr_unity_plugin/releases/tag/1.2.3).

5. Add a new **AI Vision** module, recognizing *ceiling*, *floor*, *wall*, *chair*, *table* and *bed*, to have application understand your surroundings so as to seamlessly mix **real** and **digital** in a natural life style of interaction. With regard to Unity plugin usage, please refer to "*SRWorks Unity API Reference.docx*" and "*Getting Started with SRWorks in Unity.docx*".
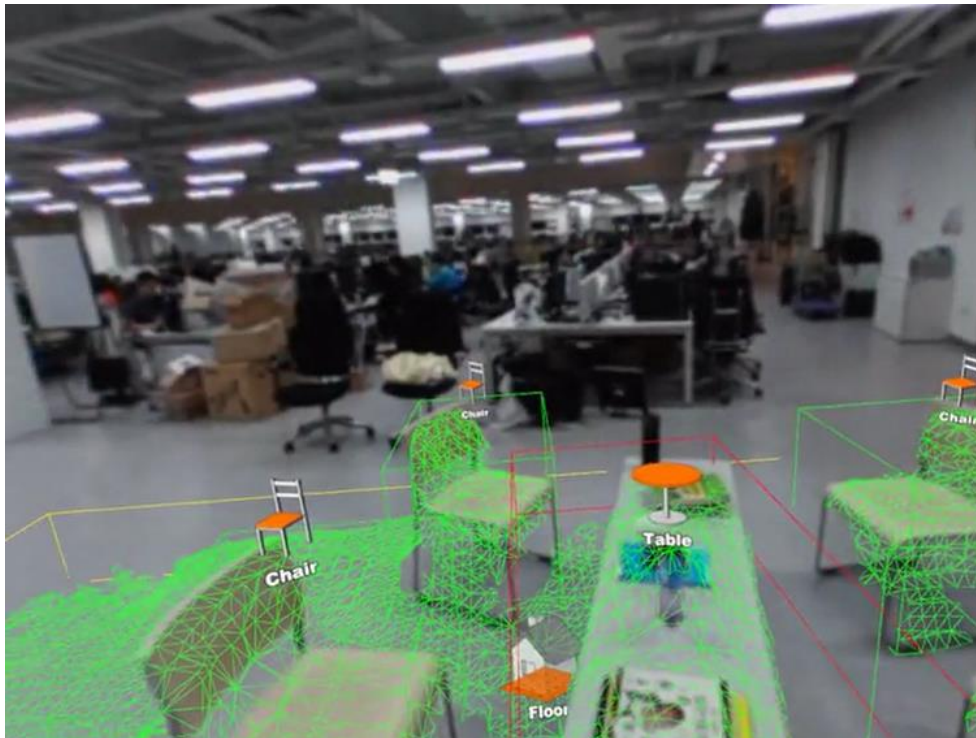
   With regard to Unity sample, please refer to "*Getting Started with SRWorks Experience in Unity.docx*" .

   • **Sample5 – Chair Segmentation**: 3D chair recognition with anchor point
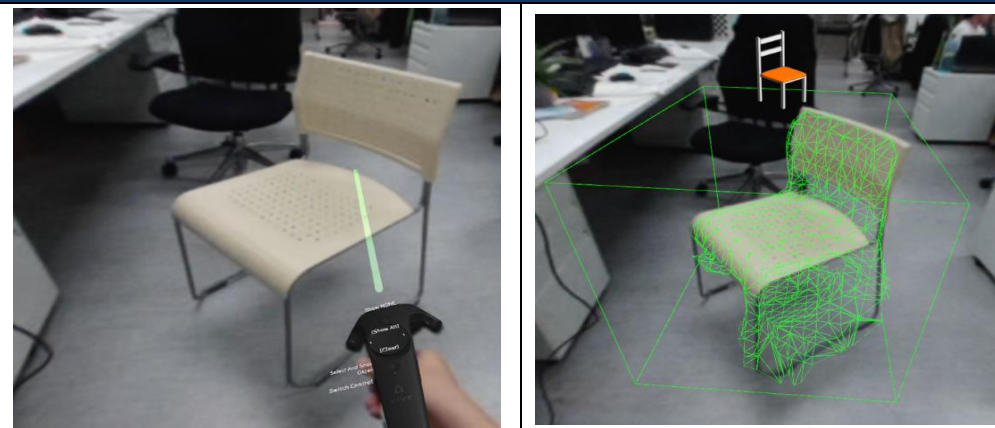
finding, https://youtu.be/eMB_nApqb6w

- **Sample9 – Semantic Segmentation**: 3D segmentation with bounding box and annotation, https://youtu.be/94uKZCV5fH4
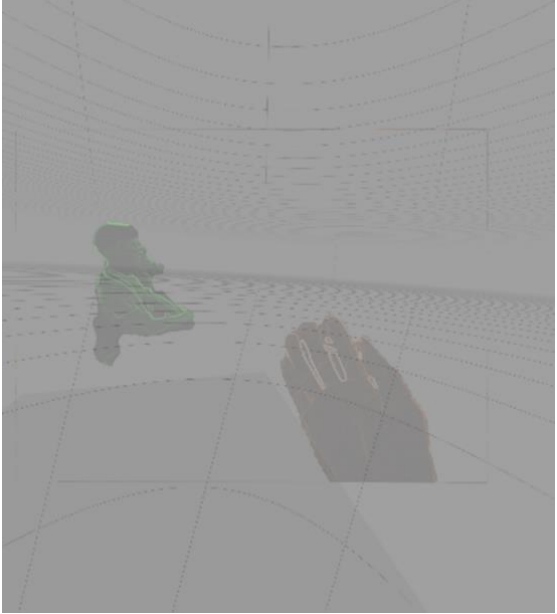

Pointing a real chair to show segmented mesh and bounding box

- **Specific Sample – Chaperone**: human detection chaperone running

background.

Chaperone UI	Mirror of HMD: Human shown on Overlay
Detection disabled	
Detection enabled	

With regard to C example, please refer to "*Getting Started with C API for SRWorks.docx*".
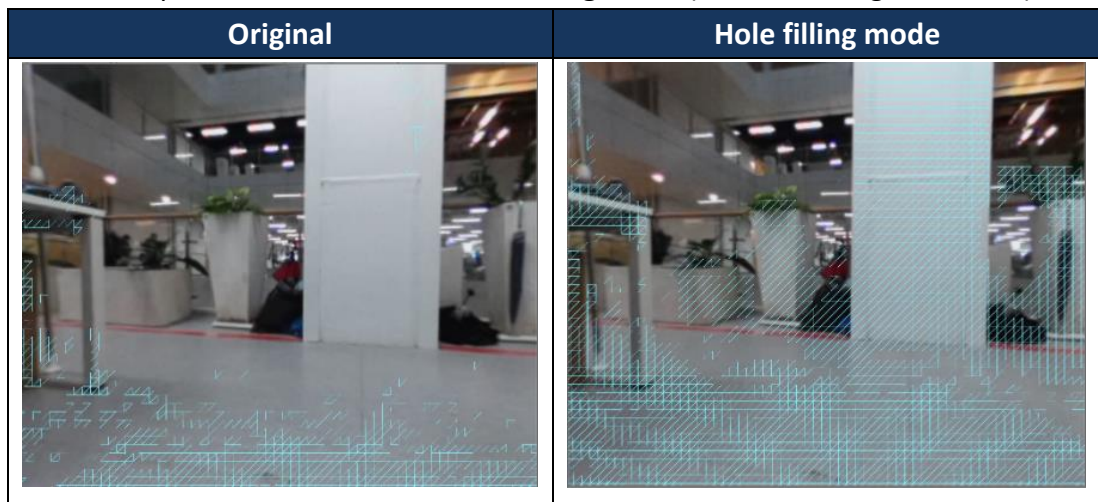
- sample-ModuleAI_Vision_2D vc project: 2D segmentation.
- sample-ModuleAI_Vision_3D vc project: 3D scene understanding.
- ViveSR_VS2015_SampleCode vc project: SRWorks sample viewer.

6. Add the following new samples in Unity *Experience* as well, referring to "*Getting Started with SRWorks Experience in Unity.docx*"

- **Sample8 – Tile Drawer**: place tiles on a specified plane and the effect of Depth Occlusion application.

Disable depth occlusion	Enable depth occlusion

- **Demo Sample**: Integrate "**Camera Control**", "**Depth Image Control**" and

"**Chair Segmentation**" together.

7. To address opencv conflicting with SRWorks in certain cases, replace previous opencv_world310.dll with a custom built sr_opencv_world342.dll.

8. For easier debugging and development, offer an interface viewer in C Sample code (**sample-vs2015**), referring to "*Getting Started with C API for SRWorks.docx*".

9. Enhance Depth collider mesh with **hole filling** mode (default setting is enabled).

Original	Hole filling mode

Known issues:

1. OpenVR could fail to launch when repeatedly restarting SRWorks when AI Vision module is enabled.
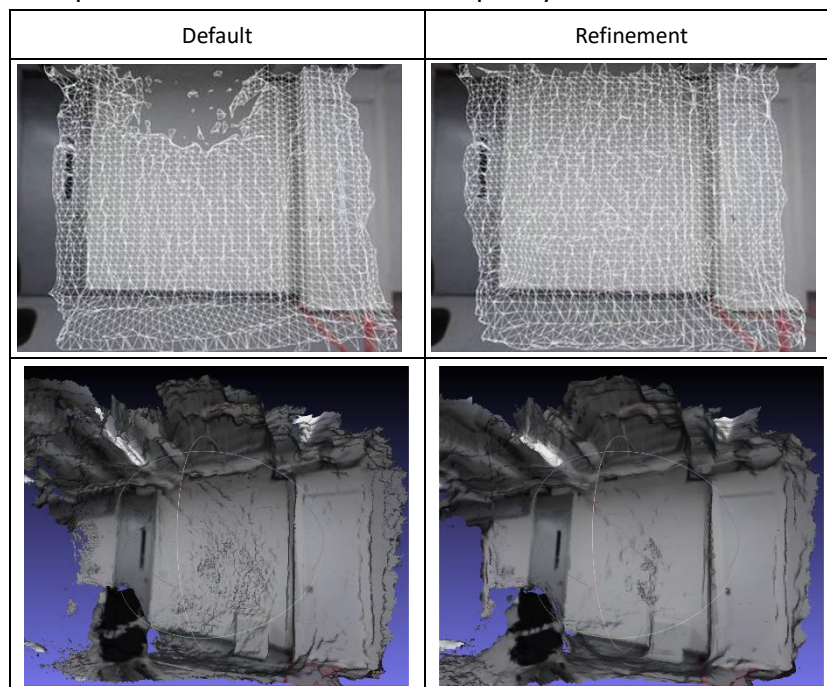
SRWorks v0.7.5.3 (2018/07/3)

Changes:

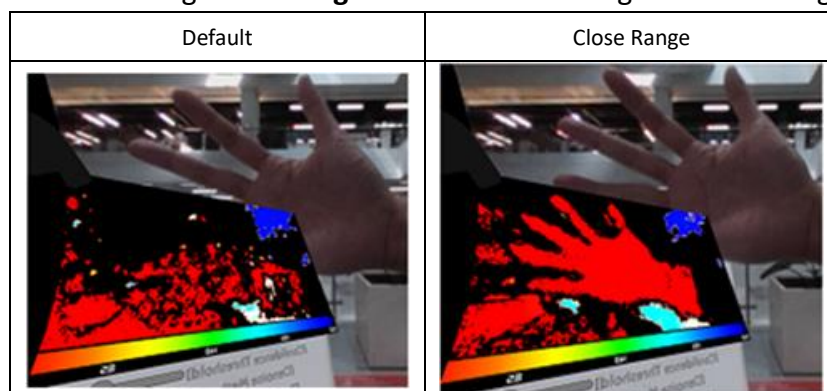Replace DualCameraInterface.dll and ViveSR_SystemMonitor.dll with new ones.

1. Be compatible with additional OpenGL contexts.

2. Support all types of TrackingSpace openvr defined.

SRWorks v0.7.5.0 (2018/05/31)

Changes:

1. Fix random crash issue in 3D reconstruction engine during long-running session of spatial scan.
2. Reduced the latency of the camera to the HMD display to ~100 ms.
3. Optimize the performance of depth engine and 3D reconstruction engine.
4. Improve mesh quality during spatial scan of 3D reconstruction engine.
5. Provide depth engine control APIs. For various use scenarios, refer to Sample2_DepthImage.unity or sample-vs2015_ModuleDepthControl.

   - Ex1: Configure the de-noise filter and enable **Refinement** mode to enhance the plain colored wall reconstruct quality.

Default	Refinement

   - Ex2: Enabling **Close Range** mode for close-range hand tracking.

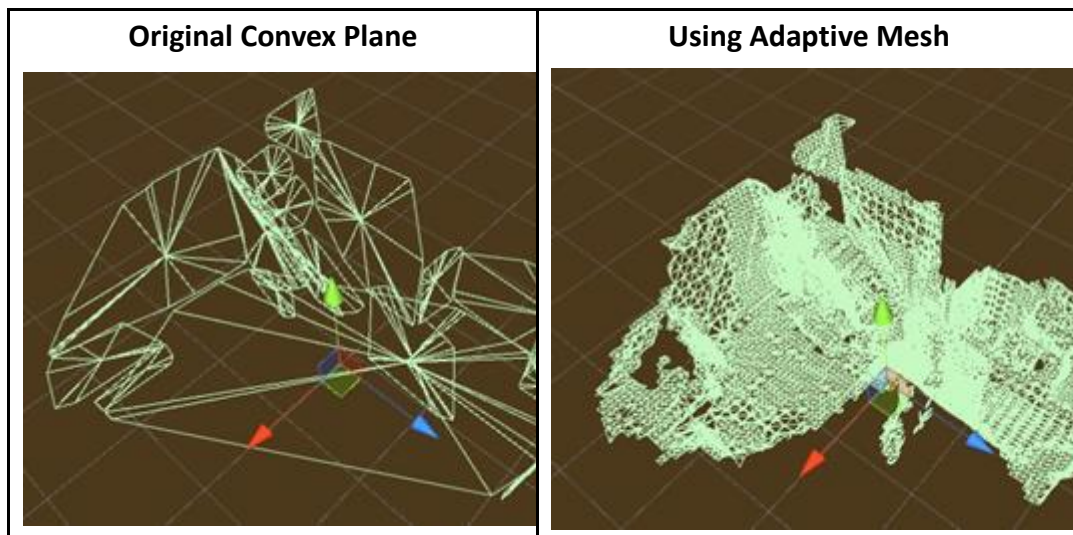| Default	Close Range

6. Provide camera control APIs such as brightness, contrast, saturation and white balance etc. For various use scenarios, refer to Sample6_CameraControl.unity or sample-vs2015_CameraControl.
7. Removed Portal Unity project included in v0.7.0.0 and replaced with Sample7_Portal.unity. New sample project is also integrated into Unity Experience demo.
8. Compatible with Unity 5.5.3, 2017 and 2018.0.1
9. Compatible with Unreal Engine 4.19
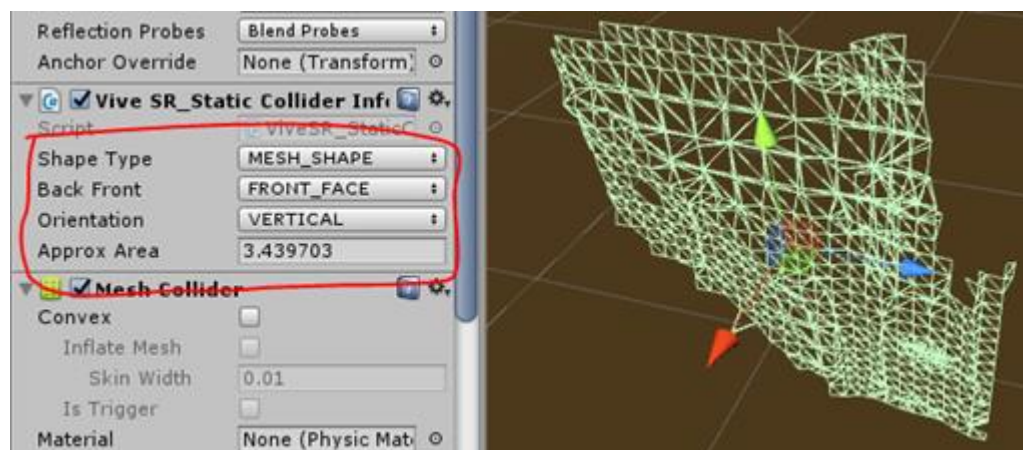10. Suggest to update NVIDIA graphics driver to the latest.
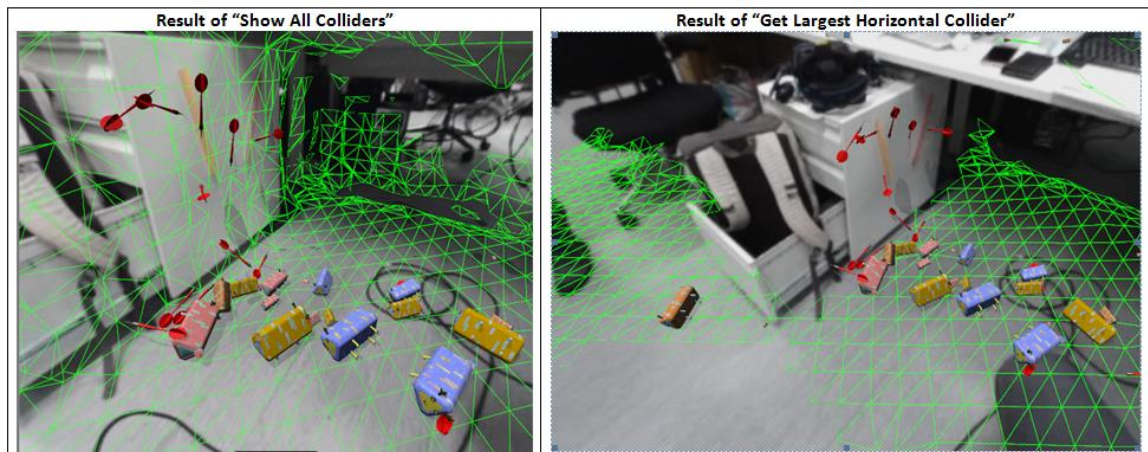
SRWorks v0.7.0.0 (2018/03/02)

Changes:

1. Generate colliders by adaptive mesh and patch the fragile colliders together to prevent from holes without physical collision in the previous version, referring to its demo video $(Vive-SRWorks-0.7.0.0)\Unity\Demo Video\ 2-Spatial Scan.mp4.

Original Convex Plane	Using Adaptive Mesh

2. Export more collider properties: **Orientation**(Horizontal, Vertical, Oblique), **Shape**(Convex, Bounding Rect, Mesh), **Area** (Approximate)

3. Export Unity API: GetAllHorizontal(Vertical) / GetLargestHorizontal(Vertical) / GetColliderWithProperties(property array);

Result of "Show All Colliders"   Result of "Get Largest Horizontal Collider"

4. Provide a Portal prefab in Unity to facilitate the developer to create a portal for the player passing through between real and virtual worlds, referring to its demo video $(Vive-SRWorks-0.7.0.0)\Unity\Demo Video\ 4-Portal.mp4 and user guide $(Vive-SRWorks-0.7.0.0)\Unity\Plugin\SRWork_Portal_Unity_Guideline.docx for details.

5. Fixed Unreal occasionally crash occurred in v0.6.0.0.
6. Fixed Sample3_DynamicMesh of SR Experience would not work issue in v0.6.0.0.
7. Please update NVIDIA graphics driver to 390.77 or later to fix SteamVR occasionally frozen on some platform with NVIDIA Pascal series.
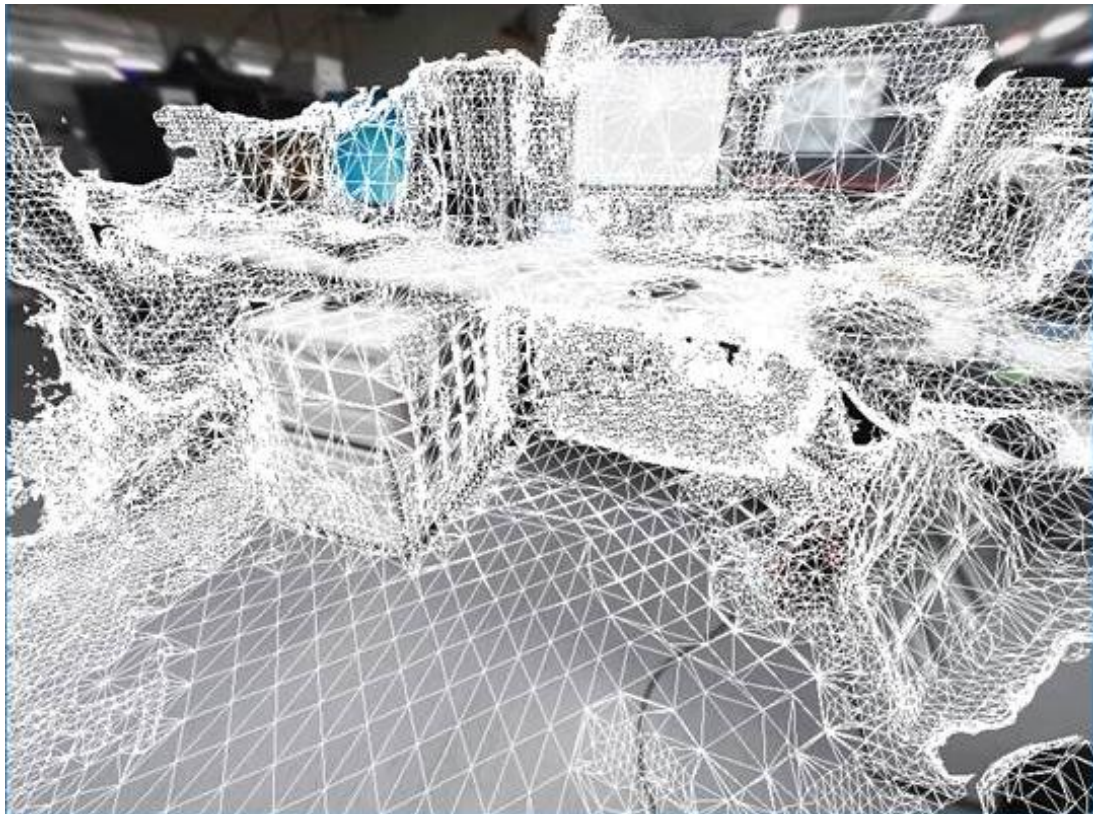
SRWorks v0.6.0.0 (2017/12/29)

SDK Folder Structure
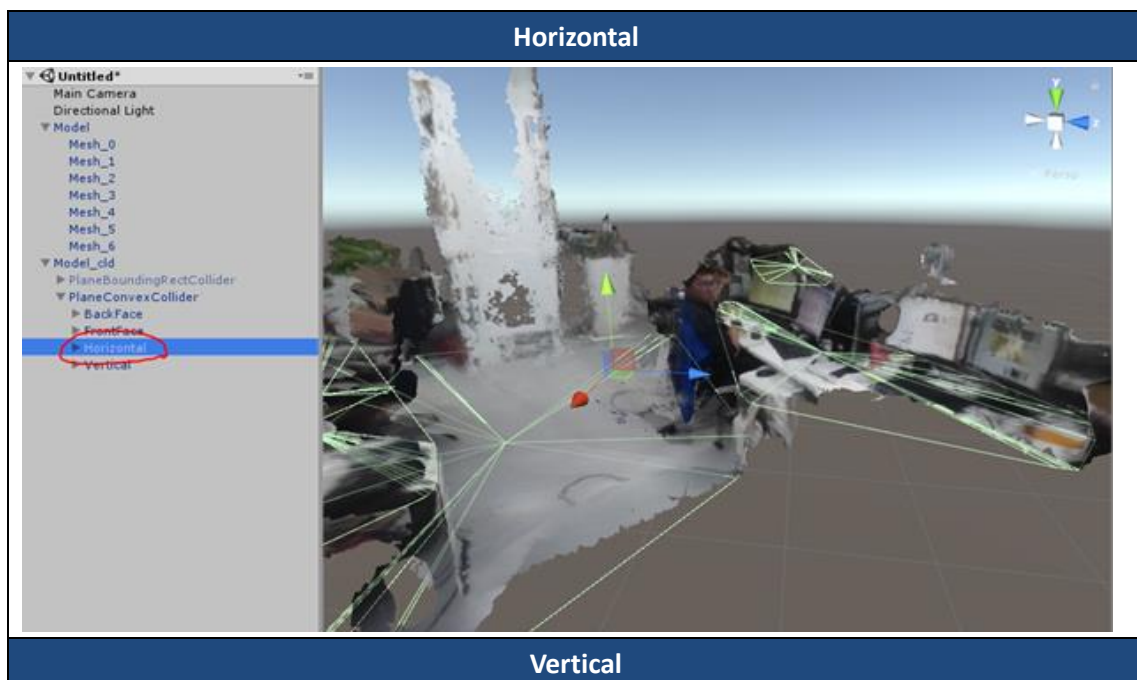
Vive-SRWorks-0.6.0.0\

- C\
  - **Getting Started with C API for SRWorks.docx**
  - sample-vs2015\
    - **ViveSR.sln**: sample code project file
    - x64\
      - Release\
        - **sample-vs2015.exe**: pre-built of C sample code
- Unity\
  - Experience\
    - Build\
      - **Vive SRWorks Demo.exe**: pre-built of SR Experience
    - **Vive-SRWorks-0.6.0.0-Unity-Experience.unitypackage**: Source code of SR Experience demo application including all features of SDK.
  - Plugin\
    - Build\
      - **Vive SRWorks.exe**: pre-built of plugin's sample scene
    - **Vive-SRWorks-0.6.0.0-Unity-Plugin.unitypackage**: SRWorks Unity plugin
- Unreal\
  - Experience\
    - **Getting Started with Unreal for SR Experience.docx**
    - **Vive-SRWorks-0.6.0.0-Unreal-Experience.zip**: Sample code of SR Experience
  - Plugin\
    - Build\
      - WindowsNoEditor\
        - **ViveSR_Unreal.exe**: pre-built of plugin's sample scene
    - **Getting Started with Unreal for SRWorks.docx**
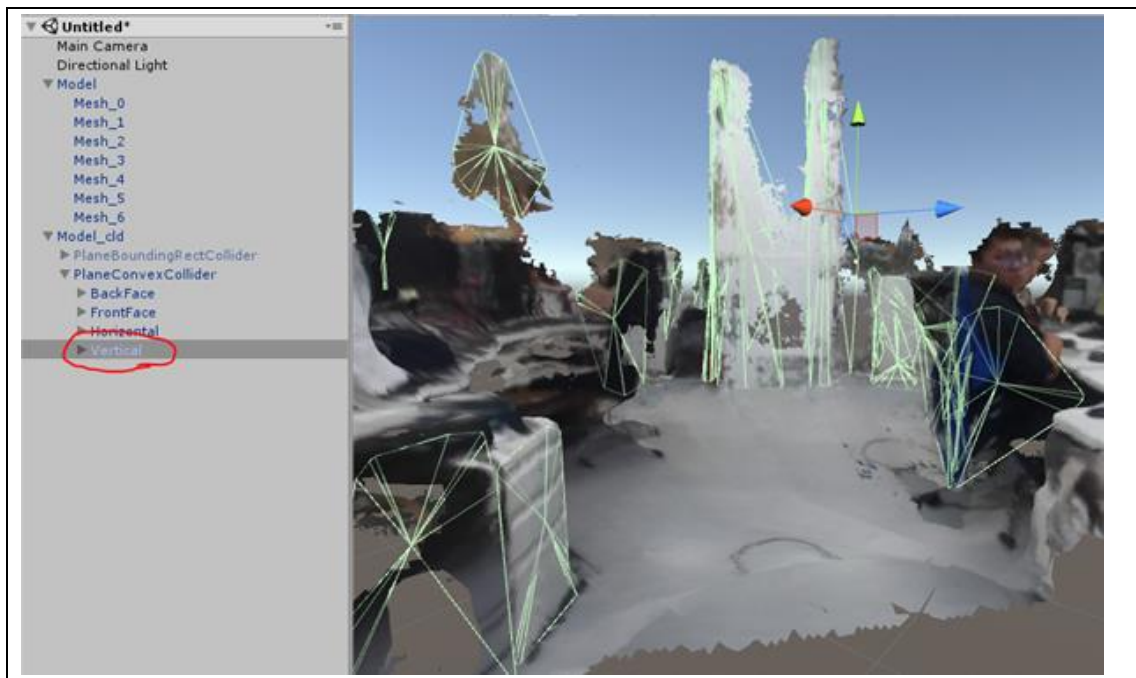   - **Vive-SRWorks-0.6.0.0-Unreal-Plugin.zip**: SRWorks Unreal plugin

Changes:

1. Unreal plugin supported

2. Support live and adaptive mesh creation during static scan illustrated as below.
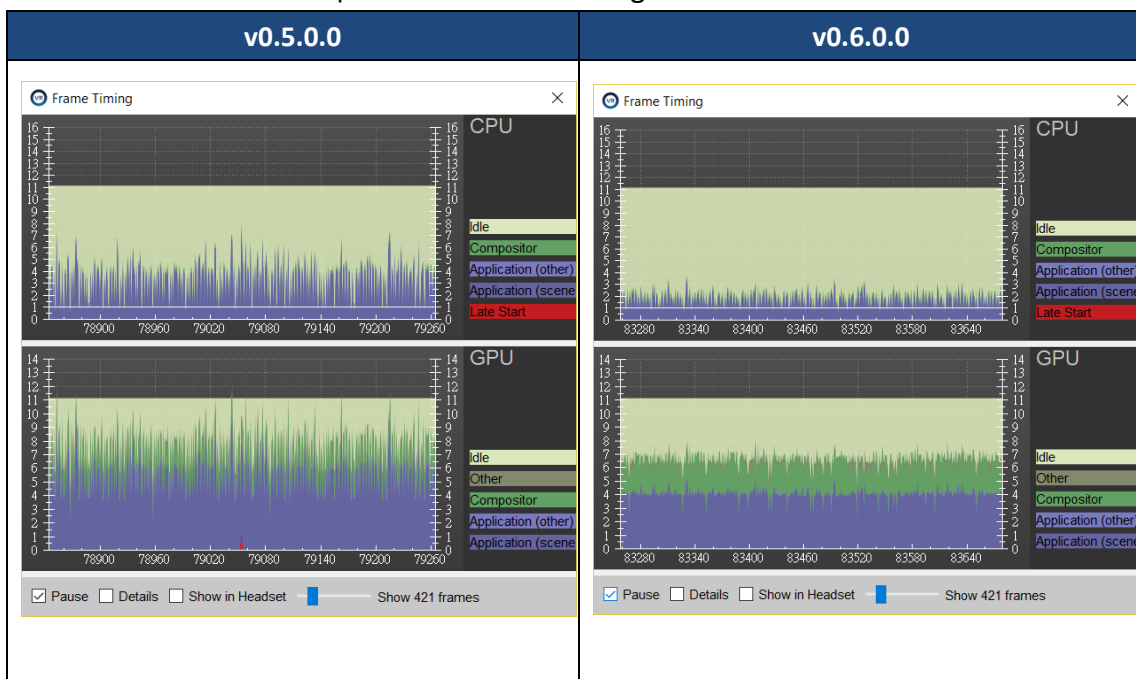

3. Mesh simplification and categorize plane's colliders to Horizontal and Vertical in OBJ file if matched criteria illustrated as below.

Horizontal

Vertical

4. Optimization for see-through judder removal even depth function enabled. The figures below illustrate the improvement of see-through.

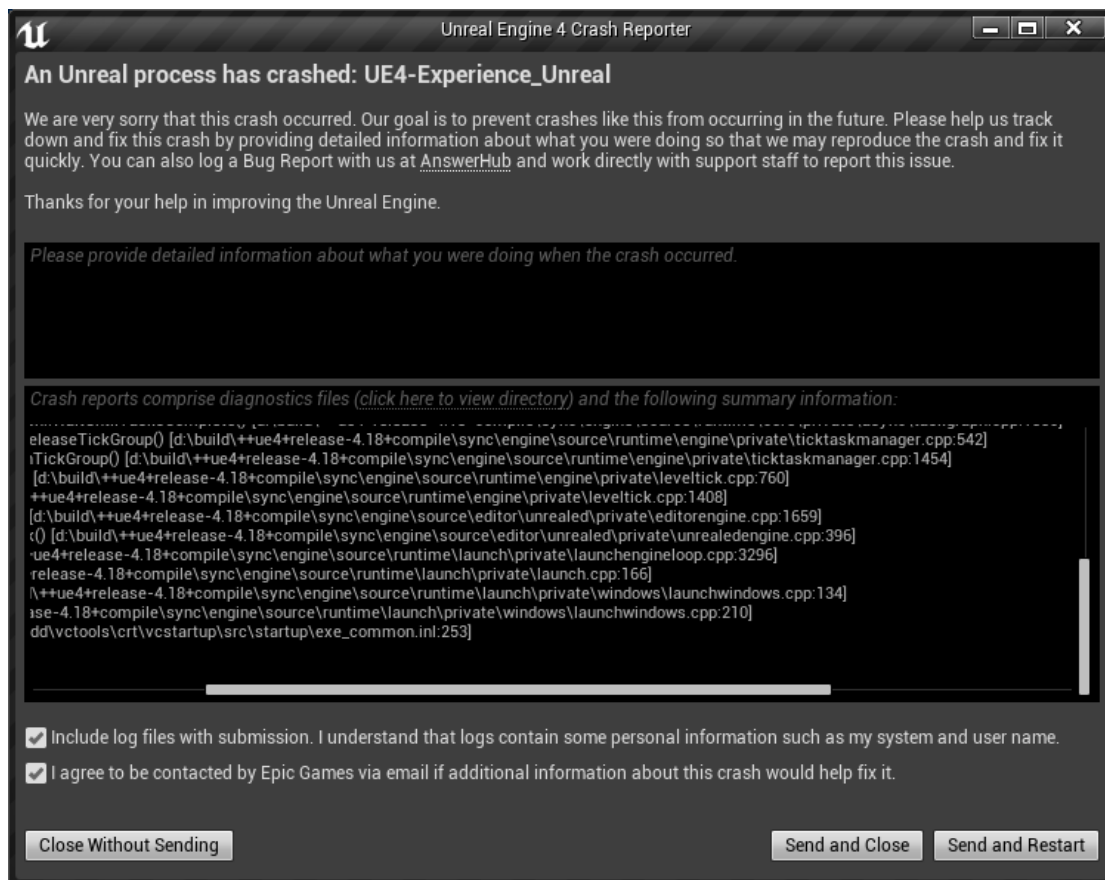| v0.5.0.0	v0.6.0.0

5. Improve dynamic mesh quality and increase its distance range from 2m to 10m.
6. Adjustable frame rate of depth stream adapted to various applications. (default 30 fps)
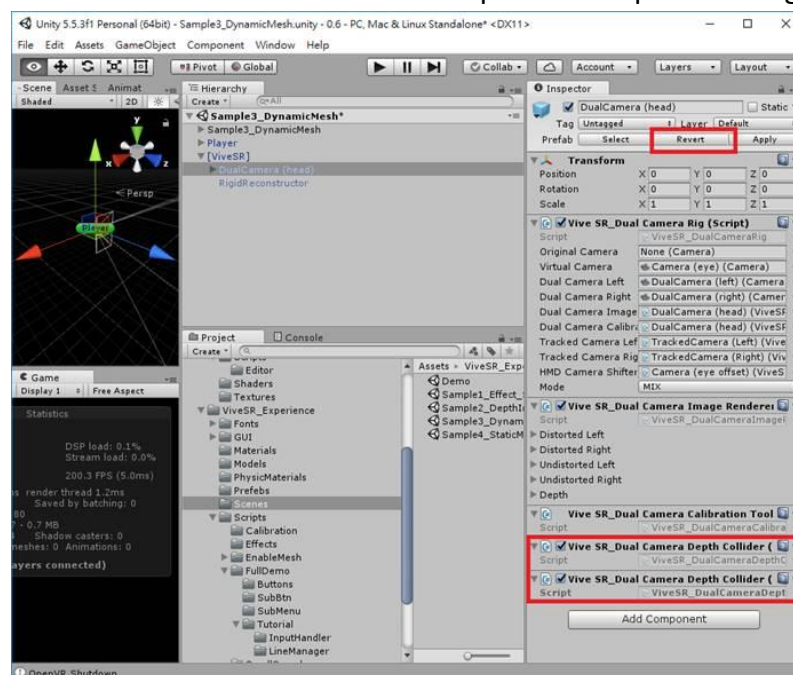
Known issues:

1. SteamVR will occasionally freeze on some platform combination with NVIDIA Pascal series GPU after enable Depth function even though SRWorks is still working.

2. Unreal will occasionally crash as below figure shown.

3. The flag "Show Dynamic Collision" used to show/hide the collider in Sample3_DynamicMesh of SR Experience would not work. The workaround is to click on **Revert** button to remove duplicated scripts as the figure below.

4.

SRWorks v0.5.0.0 (2017/11/30)

Changes:

1. Improve coordinate alignment between real and virtual world.
2. Reduce CPU utilization and improve GPU scheduling more efficient.
3. Enhance 3D reconstruction tracking accuracy.
4. Add a new function for dynamic mesh creation generated from each single depth frame. Go to the menu *Enable Mesh/Dynamic* of Experience.

Known issues:

1. SteamVR will occasionally freeze on some platform combination with NVIDIA Pascal series GPU after enable Depth function even though SRWorks is still working.
2. See-through judder after enable depth function.
3. To start 3D scanning in Unity Editor, you have to leave Scene window to let controllers invisible from all cameras including Scene itself.