

Vision SDK TDA3xx

View To World Mesh Generation Tool

User Guide

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1 Introduction

View To World (V2W) Mesh Generation Tool is a PC based tool which is used in the following TWO modes:

1. **Surround View (SRV) Generation Mode:** In this mode the user can change the virtual camera position, target (vehicle) position and the view angle along the X,Y and Z axes. Once the desired view is arrived at the view parameters generated should be stored back.
2. **V2W Mesh Generation Mode:** For every intermediate view transition between the SRV views generated in the SRV Generation mode, the view parameters and the V2W mesh are generated and saved into the V2W.BIN and V2W_IDX.BIN files.

The following input files are used by the tool:

1. **srv_params.txt** : This file contains all the input parameters used by the tool.
2. **srv_views.txt** : This file contains the SRV views generated in the SRV Generation mode.

This document is applicable for Vision SDK versioned 2.11 and greater.

1.1 Sample Input files:

- **srv_params.txt:**

```
Surround View Parameters:
-----

/*
 * Flag to generate V2W file:
 * 1 - The V2W files are generated based on the generated views
 * 0 - This mode is used to generate the desired views
 */
Srv_genV2WFile 1

/*
 * Surround View Output Resolutions and start location within
 * 1920x1080 screen
 */
Srv_outputWidth 752
Srv_outputHeight 1008
Srv_outputStartX 584
Srv_outputStartY 36

/* Sub Sample Ratio */
```

```
Srv_subSample 16

/* Number of Surround Views */
Srv_numView 10

/* Number of View Pairs */
Srv_numPairs 6

/* Percentage of Car Model that inner box fills */
Srv_boxPercentage 25

/* Flag to show inner car box */
Srv_showInnerBox 0

/* Flag to show the set size */
Srv_setSize 30

/*
 * Car image selection:
 *      0:jeep
 *      1:suv
 *      2:sedan_generic
 */
Srv_carSelect 0

/* Scale of the car image */
Srv_carScale 25

/*
 * Car image dump format
 *      0 -> Y only
 *      1 -> Y + UV
 */
Srv_carDumpFormat 1

/*
 * Enable/Disable dumping of rendered data to the file
 */
Srv_dumpRenderData 0
```

```

/*
 * Dump the car image from the first view into carimage.c file in RGB
565 format
 */
Srv_dumpCarImage 0

```

- **srv_views.txt:**

```

0.000000, 0.000000, 200.000000, 0.000000, 0.000000, 0.000000, 0.000000, 0.000000,
0.000000
0.000000, 0.000000, 400.000000, 0.000000, 0.000000, 0.000000, 0.000000, 0.000000,
0.000000
0.000000, -260.000000, 240.000000, 0.000000, 0.000000, 0.000000, -0.000000, 0.000000,
0.000000
0.000000, -260.000000, 160.000000, -5.000000, 0.000000, 0.000000, 0.000000, 0.000000,
0.500000
0.000000, -260.000000, 160.000000, -5.000000, 0.000000, 0.000000, 0.000000, 0.000000,
1.500000
0.000000, -260.000000, 140.000000, -5.000000, 0.000000, 0.000000, 0.000000, 0.000000,
2.500000
0.000000, -280.000000, 160.000000, -10.000000, 0.000000, 0.000000, 0.000000, 0.000000,
3.140000
0.000000, -280.000000, 160.000000, -10.000000, 0.000000, 0.000000, 0.000000, 0.000000,
4.000000
0.000000, -280.000000, 160.000000, -10.000000, 0.000000, 0.000000, 0.000000, 0.000000,
5.000000
0.000000, -280.000000, 160.000000, -10.000000, 0.000000, 0.000000, 0.000000, 0.000000,
5.500000

0, 1, 30, -400, 400, -400, 400
1, 2, 30, -400, 400, -400, 400
2, 3, 15, -400, 400, -400, 400
3, 4, 15, -400, 400, -400, 400
4, 5, 15, -400, 400, -400, 400
5, 6, 15, -400, 400, -400, 400

```

1.2 Pre-requisites:

- Install the following DLLs:
 - glew32.dll
 - msvcpr140.dll
 - vcruntime140.dll
- The following files/directory should be present along with the executable:
 - Standalone directory
 - jeep_outside.bmp
 - jeep_outside2_raw.bmp
 - jeep2.bmp
 - SedanV4_white.bmp

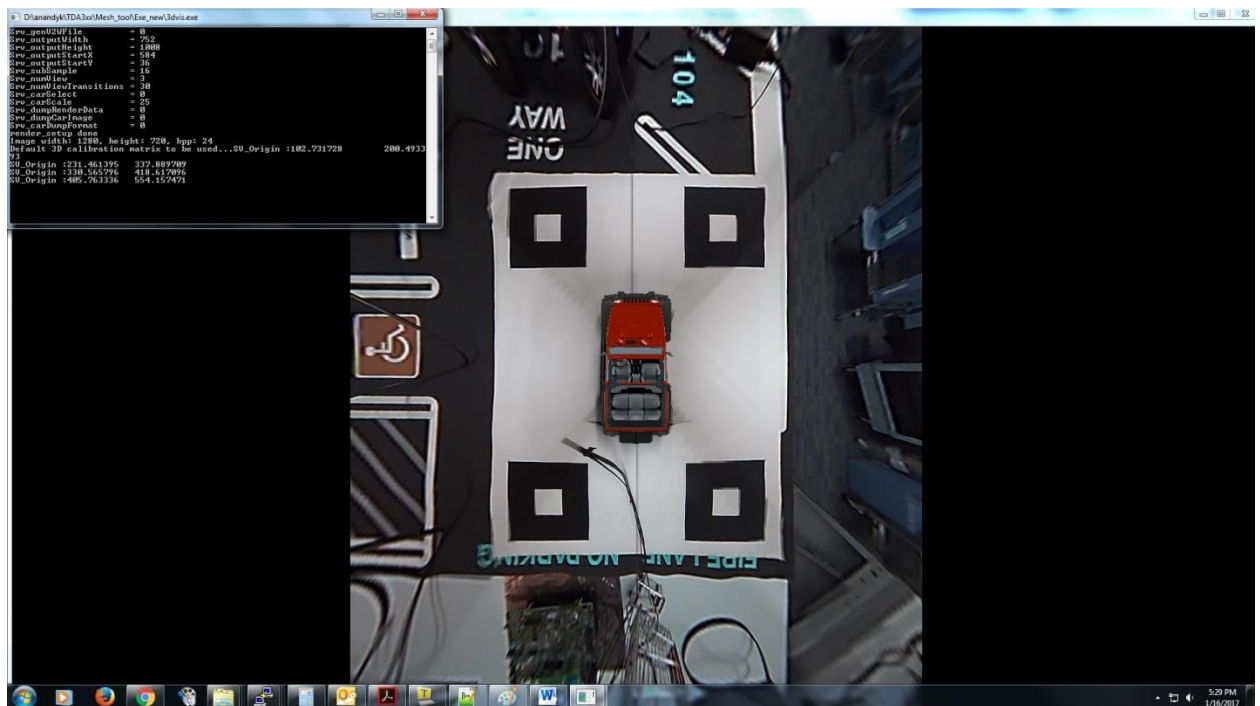
- suv.bmp
- jeep.pod
- sedan_generic.pod
- suv.pod
- srv_params.txt
- srv_views.txt

2 Surround View (SRV) Generation Mode

Set 'Srv_genV2WFile 0' in the srv_params.txt file to run the tool in SRV Generation mode.

In order to see the inner car box coordinates where the seam lines will originate from, set the `Srv_showInnerBox` to 1. A blue box will appear and the corners of this box will be the starting point of the surroundview seam lines. This box can be sized by changing the `Srv_boxPercentage` value in `srv_params.txt`.

Run the '3dvis.exe' executable and you should see the following console window:



On the console window use the following options to generate the SRV views:

- Press 'c' to change the virtual camera position along X,Y and Z direction:
Now press 'i' to increase the value or 'd' to decrease the value.
Now keep pressing the required axis (either 'x' or 'y' or 'z') till the desired position is reached at.
- Press 't' to change the target (vehicle) position along X, Y and Z direction:

Now press 'i' to increase the value or 'd' to decrease the value.

Now keep pressing the required axis (either 'x' or 'y' or 'z') till the desired position is reached at.

- Press 'a' to change the view angle along X, Y and Z direction:

Now press 'i' to increase the value or 'd' to decrease the value.

Now keep pressing the required axis (either 'x' or 'y' or 'z') till the desired angle is reached at.

When the desired SRV view is obtained using the above 3 options which generates 9 parameters, copy these 9 parameters in to the 'srv_views.txt' file. In addition to copying the 9 parameters, define a view pair below your set of viewpoints. The parameters of a view pair are defined below:

<start view> <end view> <number of transitions between views> <left bowl inflection> <right bowl inflection> <front bowl inflection> <back bowl inflection>

Note 1: The view numbers correspond to the number of the view defined in the above set, starting with 0.

Note 2: The bowl inflection points use the center of the surround view image as the origin. The default bowl inflection values are -400, 400, -400, 400.

3 V2W Mesh Generation Mode

Set 'Srv_genV2Wfile 1' in the 'srv_params.txt' to run the tool in this mode.

Set 'Srv_showInnerBox 0' in the 'srv_params.txt' to run the tool in this mode.

The other following parameters in the 'srv_params.txt' can be changed as per the requirement:

- Srv_outputWidth
- Srv_outputHeight
- Srv_outputStartX
- Srv_outputStartY
- Srv_subSample
- Srv_numView
- Srv_numPairs
- Srv_boxPercentage
- Srv_showInnerBox
- Srv_setSize
- Srv_carSelect
- Srv_carScale
- Srv_carDumpFormat
- Srv_dumpRenderData
- Srv_dumpCarImage

The `Srv_outputWidth` and `Srv_outputHeight` values are parameterizable as long as the `Srv_outputStartX` and `Srv_outputStartY` are set such that the surroundview image is centered on the display. Due to requirements by the LDC, the output width and height values must be multiples of 16. Additionally, the maximum output resolution is 1280x1080.

Note: For height values of 1008 and greater, the tool must be run on a screen with a height greater than 1080. This is due to the fact that the rendering for sizes greater than 1008 will be cropped by the status bar.

Make sure the value of `'Srv_numView'` in the `'srv_params.txt'` is less than or equal to the number of views in the `'srv_views.txt'`. Also, make sure the value of `Srv_numPairs` is less than or equal to the number of pairs of views listed in the `srv_params.txt`.

Run the `'3dvis.exe'` executable.

Now the tool will start generating the view parameters and the V2W mesh for all the intermediate transition views.

The following files get generated at the end of the execution of the tool:

- `out/V2W.LZ4`
- `out/V2W_IDX.BIN`
- `out/CARIMG_SETx.LZ4`
- `out/CARIMG_IDX.BIN`

4 Revision History

Version	Date	Revision History
0.1	26 th October 2016	Draft
0.2	16 th January 2017	Updated for Vision SDK release 2.12
0.3	29 th June 2017	Updated for Vision SDK 3.0
0.4	30 th November 2017	Updated for Vision SDK 3.02

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