

Vision SDK TDA3xx

View To World Mesh Generation Tool

User Guide

Copyright © 2017 Texas Instruments Incorporated. All rights reserved.

Information in this document is subject to change without notice. Texas Instruments may have pending patent applications, trademarks, copyrights, or other intellectual property rights covering matter in this document. The furnishing of this documents is given for usage with Texas Instruments products only and does not give you any license to the intellectual property that might be contained within this document. Texas Instruments makes no implied or expressed warranties in this document and is not responsible for the products based from this document.

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Customers are responsible for their applications using TI components.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards ought to be provided by the customer so as to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, license, warranty or endorsement thereof.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations and notices. Representation or reproduction of this information with alteration voids all warranties provided for an associated TI product or service, is an unfair and deceptive business practice, and TI is neither responsible nor liable for any such use.

Resale of TI's products or services with *statements different from or beyond the parameters* stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service, is an unfair and deceptive business practice, and TI is not responsible nor liable for any such use.

Also see: [Standard Terms and Conditions of Sale for Semiconductor Products.](http://www.ti.com/sc/docs/stdterms.htm)
www.ti.com/sc/docs/stdterms.htm

Mailing Address:

Texas Instruments
Post Office Box 655303
Dallas, Texas 75265

Copyright © 2017, Texas Instruments Incorporated

TABLE OF CONTENTS

1	Introduction	4
1.1	Sample Input files:	4
1.2	Pre-requisites:	7
2	Surround View (SRV) Generation Mode.....	7
3	V2W Mesh Generation Mode.....	9
4	Revision History	11

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 0

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

```
Srv_bowlWidth 752
Srv_bowlHeight 1008

Srv_bowlSlope 1.0f

/* Sub Sample Ratio */
Srv_subSample 16

/* Number of Surround Views */
Srv_numView 10

/* Number of View Pairs */
Srv_numPairs 4

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

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

/* Options for mat under car */
Srv_showCarMat 1

/* Scale factor in %, 100% being boundary of car */
Srv_carMatScaleX 115
Srv_carMatScaleY 115

/* Texture in bmp to be placed under car, will be picked
 * from `resources/mat/` location.
 */
Srv_carMatTexture checkered_2.bmp

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

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

```

*/
Srv_carSelect 2

/* Scale of the car image */
Srv_carScale 20

/*
* 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
 - msvcp140.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
 - checkered_2.bmp in `resources/mat` directory

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_showCarMat
- Srv_carMatScaleX
- Srv_carMatScaleY
- Srv_carMatTexture
- 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

« « « § » » »