Vision SDK
TI Deep Learning (TIDL)

User Guide

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1 Introduction

This user guide provides details on how to build and run TI Deep Learning (TIDL) algorithm file I/O based use cases.

Pl. refer to the following CDDS link for the videos on TIDL algorithm and Vision SDK TIDL use case:

https://cdds.ext.ti.com/ematrix/common/emxNavigator.jsp?objectId=28670.42872.30602.25095

The outlines of the TIDL file I/O use cases are as follows:

- This is file input and output based use case where in input frames are read from the input file and output frames are written to output file.
- The TIDL algorithm can be run either on EVEs or DSPs cores.
- An entire input frame is processed on a single core (EVE/DSP) and there are 2 processing pipelines which process alternate frames.

2 Build and Run TIDL use case

The TIDL use case is enabled and runs on TDA2XX SoC only.

Build the Vision SDK for TDA2XX BIOS configuration choosing the '*MAKECONFIG?=tda2xx_evm_bios_all*' in the Rules.make.

Pl. refer to the '*VisionSDK_UserGuide_TDA2xx.pdf*' for steps on building and running the Vision SDK.

Before running the Vision SDK binary,

- Make sure the following files are present in the MMC/SD card:
  - TIDLCFG.TXT (TIDL use case configuration file)
  - Input file
  - TIDL Network file
  - TIDL Parameter file
- The format of the 'TIDLCFG.TXT' is as shown below:

```
TIDL Configuration parameters
-----------------------------


###################################################################
###############
IMP:       Make  sure  the  size  of  the  file  names  (excluding
extension) is not more
        than 8 characters.
###################################################################
###############


inputWidth=1024
inputHeight=512
inputFile=IN.RGB
```

```
outputFile=OUT.BIN
netFileName=NET.BIN
paramFileName=PRM.BIN
```

Now run the Vision SDK binary and select option 'd (TIDL File I/O Usecase)' from the 'Vision SDK Usecases' main menus.

Select the core to run the TIDL algorithm:

```
[IPU1-0]  ====================
[IPU1-0]  Core Menu
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  1: DSP
[IPU1-0]  2: EVE
```

Select the Use case Mode:

```
[IPU1-0]  ====================
[IPU1-0]  Use case Mode
[IPU1-0]  ====================
[IPU1-0]
[IPU1-0]  1: Dump Output Frames to file
[IPU1-0]  2: Free Run (Output Frames are not dumped)
```

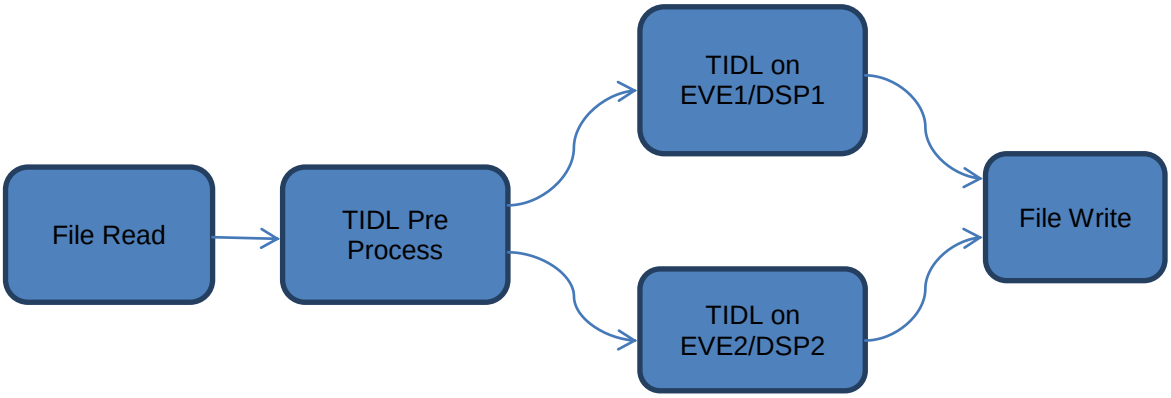
When option '1:Dump Output Frames to file' is selected, the output frames are dumped to the '`outputFile`' file and the use case exits once all the frames in the '`inputFile`' are processed.

The option '2: Free Run' doesn't dump the output frames to file and runs until stopped. This is used mainly to get the statistics data of the use case like DDR bandwidth , processor loading, TIDL algorithm performance.

3 TIDL file I/O use case

The TIDL use case can run either on EVE or DSP cores.

Entire input frame is processed on a single core and there are 2 processing pipelines which process the input frames alternatively:



The TIDL generates an 8 bit class ID (0-4) for every input pixel. This class ID represents the segment into which the input pixel belongs to.

The FIVE segments supported are:

Class ID	Segment
0	None
1	Road
2	Pedestrian
3	Traffic Sign
4	Vehicle

4 Build and Run Semantic Segmentation use case

The Semantic Segmentation use case is enabled and runs on TDA2XX SoC only.

Build the Vision SDK for TDA2XX BIOS configuration choosing the '*MAKECONFIG?=tda2xx_evm_bios_all*' in the Rules.make.

Pl. refer to the '*VisionSDK_UserGuide_TDA2xx.pdf*' for steps on building and running the Vision SDK.

Before running the Vision SDK binary,

- Make sure the following files are present in the MMC/SD card:
  - TIDLCFG.TXT (TIDL use case configuration file)
  - Input file
  - TIDL Semseg Network file (NET_Semseg.bin)
  - TIDL Semseg Parameter file(PRM_Semseg.bin)
  - TIDL Semseg Usecase input data file (inData_semSeg)
  - TIDL Semseg Usecase input header file (inHeader_semSeg)

5 Build and Run TIDL Object detect use case

The TIDL Object detect use case is enabled and runs on TDA2XX SoC only.

Build the Vision SDK for TDA2XX BIOS configuration choosing the '*MAKECONFIG?=tda2xx_evm_bios_all*' in the Rules.make.

Please refer to the '*VisionSDK_UserGuide_TDA2xx.pdf*' for steps on building and running the Vision SDK.

Before running the Vision SDK binary,

- Make sure the following files are present in the MMC/SD card:
  - TIDL OD Network file (NET_OD.bin)
  - TIDL OD Parameter file (PRM_OD.bin)
  - TIDL OD Usecase input data file (inData_OD)
  - TIDL OD Usecase input header file (inHeader_OD)

6 Revision History

Version	Date	Revision History
0.1	03rd March 2017	Draft
0.2	29th June 2017	Updated for Vision SDK rel 3.0
0.3	11th Jan 2018	Added section for Build and Run Semantic Segmentation use case
0.4	26th March, 2018	Added section for Build and Run TIDL Object detect use case

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