Digital Signal Processing using CUDA

1.0

Generated by Doxygen 1.8.6

Sun Jan 19 2014 14:51:27

Contents

1 Class Index **1**

1.1 Class List 1

2 File Index **3**

2.1 File List 3

3 Class Documentation **5**

3.1 DataReader Class Reference 5

3.2 fitData Struct Reference 5

3.3 Node Class Reference 5

3.3.1 Detailed Description 6

3.3.2 Constructor & Destructor Documentation 6

3.3.2.1 Node 6

3.3.3 Member Function Documentation 6

3.3.3.1 stop 6

3.4 OutputStream Class Reference 6

3.4.1 Detailed Description 7

3.4.2 Constructor & Destructor Documentation 7

3.4.2.1 OutputStream 7

3.4.3 Member Function Documentation 7

3.4.3.1 finish 7

3.5 Ringbuffer< Type > Class Template Reference 7

4 File Documentation **9**

4.1 /home/fabian/DSP/src/Constants.h File Reference 9

4.1.1 Detailed Description 9

Index **10**

Chapter 1

Class Index

1.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

DataReader 5
fitData 5
Node 5
OutputStream 6
Ringbuffer< Type > 7

Chapter 2

File Index

2.1 File List

Here is a list of all documented files with brief descriptions:

/home/fabian/DSP/src/Constants.h
This File holds all configurations and constants 9
/home/fabian/DSP/src/**DataReader.h** . . . . . **??**
/home/fabian/DSP/src/**Node.h** . . . . . **??**
/home/fabian/DSP/src/**OutputStream.h** . . . . . **??**
/home/fabian/DSP/src/**Ringbuffer.h** . . . . . **??**
/home/fabian/DSP/src/**test_DataReader.h** . . . . . **??**
/home/fabian/DSP/src/**test_Ringbuffer.h** . . . . . **??**
/home/fabian/DSP/src/**Textures.h** . . . . . **??**
/home/fabian/DSP/src/**Types.h** . . . . . **??**

Chapter 3

Class Documentation

3.1 DataReader Class Reference

Public Member Functions

- **DataReader** (std::string filename, InputBufferWf ∗buffer)
- int **_checkFileHeader** ()
- void **readToBufferAsync** ()
- int **isReading** ()
- void **stopReading** ()
- int **get_nSamp** ()
- int **get_nSeg** ()
- int **get_nWf** ()

The documentation for this class was generated from the following file:

- /home/fabian/DSP/src/DataReader.h

3.2 fitData Struct Reference

Public Attributes

- float **param** [COUNTPARAM]
- float **startValue**
- float **endValue**
- float **extremumPos**
- float **extremumValue**
- int **status**

The documentation for this struct was generated from the following file:

- /home/fabian/DSP/src/Types.h

3.3 Node Class Reference

`#include <Node.h>`

Public Member Functions

- Node (int deviceIdentifier, InputBuffer *input, OutputBuffer *output)

  Basic constructor.
- int stop ()

  Signals, that no new data will be written into the buffer.

3.3.1 Detailed Description

Each installed device should be handled by its own thread. This class provides all functions to create a thread, copy data to and from the device and start the kernel on the device.

3.3.2 Constructor & Destructor Documentation

3.3.2.1 Node::Node (int *deviceIdentifier,* InputBuffer * *input,* OutputBuffer * *output*)

Basic constructor.

Stats a new Thread. The new Thread reads data from the input buffer, copies them to the gpu and copy the result back to the output buffer.

Parameters

deviceIdentifier	Number of the Device
input	Buffer which provides the raw input data.
output	Buffer which will be filled with the result data.

3.3.3 Member Function Documentation

3.3.3.1 int Node::stop ( )

Signals, that no new data will be written into the buffer.

This function will make the Node Thread stop, after all remaining elements in the buffer are written into the output file

The documentation for this class was generated from the following file:

- /home/fabian/DSP/src/Node.h

3.4 OutputStream Class Reference

`#include <OutputStream.h>`

Public Member Functions

- OutputStream (const std::string &file)

  Basic constructor.
- Ringbuffer< Output > * getBuffer ()

  Returns a reference of the buffer.
- void finish ()

  Signals, that no new data will be written into the buffer.

3.4.1 Detailed Description

Class that provides all functions to write the results of the computation into a file.

3.4.2 Constructor & Destructor Documentation

3.4.2.1 OutputStream::OutputStream (const std::string & *file*)

Basic constructor.

Constructor opens a filestream, initialise the output buffer and start the thread, which takes elements from the buffers and writes them into the file.

Parameters

file	Filename of the output file.

3.4.3 Member Function Documentation

3.4.3.1 void OutputStream::finish ( )

Signals, that no new data will be written into the buffer.

This function will make the Writeback Thread stop, after all remaining elements in the buffer are written into the output file

The documentation for this class was generated from the following file:

- /home/fabian/DSP/src/OutputStream.h

3.5 Ringbuffer< Type > Class Template Reference

Public Member Functions

- **Ringbuffer** (unsigned int bSize)
- int **writeFromHost** (Type *inputOnHost)
- int **copyToHost** (Type *outputOnHost)
- Type * **reserveHead** ()
- int **freeHead** ()
- Type * **reserveTail** ()
- int **freeTail** ()
- bool **isEmpty** ()

The documentation for this class was generated from the following file:

- /home/fabian/DSP/src/Ringbuffer.h

Chapter 4

File Documentation

4.1 /home/fabian/DSP/src/Constants.h File Reference

This File holds all configurations and constants.

```
#include <string>
```

Macros

- #define **CUDA**
- #define **MAXCOUNTDATA** 800
- #define **DATATYPE** float
- #define **MAXCALL** 100
- #define **COUNTPARAM** 3
- #define **PARAMSTARTVALUE** { 1, 1, 1 }
- #define **FITVALUETHRESHOLD** 0.0
- #define **STARTENDPROPORTION** 0.01

Variables

- const unsigned int SAMPLE_COUNT = 1000

  Number of samples per event.
- const unsigned int CHUNK_COUNT = 100

  Number of events copied to the GPU in one step.
- const unsigned int CHUNK_BUFFER_COUNT = 1024

  Number of chunks in the input buffer.
- const cudaTextureFilterMode FILTER_MODE = cudaFilterModeLinear

  Interpolation mode.
- const std::string **FILENAME_TESTFILE** = "../data/Al_25keV-259.cdb"
- const unsigned int **SAMPLE_COUNT_TESTFILE** = 1000
- const unsigned int **SEGMENT_COUNT_TESTFILE** = 1
- const unsigned int **WAVEFORM_COUNT_TESTFILE** = 100000

4.1.1 Detailed Description

This File holds all configurations and constants.

Index

/home/fabian/DSP/src/Constants.h, 9

DataReader, 5

finish
    OutputStream, 7
fitData, 5

Node, 5
    Node, 6
    stop, 6

OutputStream, 6
    finish, 7
    OutputStream, 7
    OutputStream, 7

Ringbuffer< Type >, 7

stop
    Node, 6