EasyAGC

Technical Document
Version 2.0－ Revision 2006-1-11

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Introduction

EasyAGC is an implementation of AGC（Automatic Gain Control）. EasyAGC support multiple channels concurrent. There is no limit on concurrent channels and it can up to thousands channels.

The binary library of EasyAGC only support 8kHz samples. If you want to support samples other than 8kHz, you need buy the source code of EasyAGC.

EasyAGC specifications	
Speech sampling rate(Hz)	8000
Samples in one Frame	any

EasyAGC has a binary release version on Windows and Linux. The source code of EasyAGC is written by C/C++, so you can easily port it to UNIX, PPC,DSP, Vxworks or other operation system that support C/C++.

PACKAGE CONTENTS

EasyAGC.pdf	This document
EasyAGC.lib	Win32 statically linkable library of AGC for Pentium and compatible processors.
libAGC.a	Linux statically linkable library of AGC for Pentium and compatible processors.
EasyAGC.h	API prototypes and constants declarations required by the sample programs.
test_agc directory	Microsoft VC6.0 sample application and Linux GCC sample application. Demonstrating how to use AGC API calls.

The input requires raw 16-bit mono PCM speech data sampled at 8000 Hz as input, i.e., without any header information. For every speech frame, consisting of any number samples

ALGORITHM COMPLEXITY

The complexity of AGC is represented as percentage of CPU usage, and is as follows when tested on an Intel 800 MHz Celeron-MMX:
AGC less than 1% CPU time

ABOUT THE SAMPLE PROGRAMS

The sample programs under test_agc directory are used to simulate the AGC and demonstrate how to initialize and call the AGC process. The program is run as follows (where **infile** and **outfile** are raw 16 bit PCM files sampled at 8 kHz):

```
test_agc infile outfile
```

To build the AGC sample programs on Windows, you can open test_agc.dsw with VC6.0 or later version. After compiler and link, it will create the execute program of test_agc.exe, you can test it with following command.

```
test_agc test.pcm test1.pcm
```

To build the AGC sample programs on Linux, you only need rum **make** command. After you successfully finished make command, you can run **make run** to test AGC.

EasyAGC API FUNCTIONS

EasyAGC_init

Description	Initializes the memory needed by the AGC process. This function must be called prior to opening or re-opening a channel.
Syntax	#include "EasyAGC.h" AGC_HANDLE EasyAGC_init();
Arguments	none
Returned value	Return a handle that represent an AGC channel, this value will used at EasyAGC_convert and EasyAGC_release

EasyAGC_convert

Description	Add automatic gain control to a speech frame, the samples in speech frame can be defined.
Syntax	#include "EasyAGC.h" bool EasyAGC_Convert(AGC_HANDLE hAGC, short *input, short *output, int numSamples);
Arguments	hAGC The handle returned by EasyAGC_init input Input speech buffer containing 16-bit PCM speech data. output Output speech buffer containing 16-bit PCM speech data which after automatic gain control. numSamples The samples number in input speech.
Returned value	Return true if successful, return false if failed.

EasyAGC_release

Description	release the memory allocated by the AGC process. This function must be called before you quit your program. If not, it will cause the memory leak.
Syntax	#include "EasyAGC.h"

bool   EasyAGC_release(AGC_HANDLE hAGC);

Arguments   hAGC   The AGC handle returned by EasyAGC_init

Returned value   Return true if successful, return false if failed.

FAQs

Here are some frequently asked questions about the EasyAGC.

Q — What type of speech input format is required?
A — Raw 16-bit mono PCM sampled at 8000Hz. Do not use .WAV files. They contain a header that will produce distortion at the start of a decoded audio sample because the encoder interprets the header as speech data.

Q — How can I convert my .WAV files to raw 16 bit mono PCM sampled at 8000 Hz?
A — Use an audio editing tool such as SoX - Sound eXchange. See
home.sprynet.com/~cbagwell/sox.html for more information

Q — Can I get link on platforms other than Pentium or compatible?
A — The object code provided in this package is Microsoft Win32 and Linux x86 compatible. It is compiled for the Pentium family of processors. If you want to use EasyAGC on other platforms, you should buy the source code of EasyAGC. Then you can compile and link.

Q — Is the EasyAGC able to handle multiple channels?
A — Yes, It can handle multiple channels. There is no limited.

Q — Is the EasyAGC codec free to use?
A — No, The version you get freely is a version only for test. If you want to use it in commercial, you must buy it from www.imtelephone.com. This version has the same function with the formal release version, but It can only run less than 6 hours continuously.

Q — How much does the EasyAGC codec cost?
A — The object code of Windows or Linux is $2000/year. The source code is $20000/year. You can buy it from www.imtelephone.com.