

# GRITTEC'S TIME STRETCHING

## Speech and audio signals

### Overview

GritTec's Time stretching technology is used for time scale modification (changing the speed or duration) of an audio signal without affecting its pitch. Principle of functioning GritTec's Time Stretching is based on time-domain modification using SOLA technology, such as Waveform Synchronized Overlap-Add (WSOLA).

### Applications

- With audio players for changing the duration of music or speech;
- With audio-video recorder devices or video post synchronization;
- For voice messaging services (voice mail);
- For reduce the rate of bit transmission (jitter control) in devices of IP telephony.

### Features

- High sound quality;
- High robustness;
- Guarantees fixed speaker position for stereo signals;
- Time-stretch (time-scale) factor: 50%, ..., 200% (normal speed: 100%);
- Dynamic mode changing of time stretch factor;
- Input packet length: 20 ms, 30 ms or inside specific;
- Dynamic mode changing of input packet length: 20 ms, 30 ms or inside specific length;
- Easy integration with target applications.

### Signal requirement

- Signal format: 16-bits linear;
- 8 kHz, ..., 48 kHz sampling rate;
- Channels: 2 (mono or stereo).

### Resource Requirements

RESOURCES	GOAL	NOTES
RAM	3862 Words	Pointer to the general structure for stereo channels.
ROM	~ 100 Words	Parameters of void and tempo procedures.
Resource/Source Ratio* (MIPS) for input packet length 20 ms	~ 5.00	For signal with sampling rate 44 kHz, 2 channels. Stretch factor is 60%.
Resource/Source Ratio* (MIPS) for input packet length 20 ms	~ 2.90	For signal with sampling rate 44 kHz, 2 channels. Stretch factor is 180%.
Resource/Source Ratio* (MIPS) for input packet length 30 ms	~ 7.00	For signal with sampling rate 44 kHz, 2 channels. Stretch factor is 60%.
Resource/Source Ratio* (MIPS) for input packet length 30 ms	~ 3.50	For signal with sampling rate 44 kHz, 2 channels. Stretch factor is 180%.

\* - for Intel PIII 1,5 MHz.

### Availability

- PC demo for MS Windows;
- SDK for win32 (C++ fixed point code) is available on request;
- Portability to any DSP, ARM or RISC platform.

GritTec Laboratory (GritTec Ltd.) specializes on research and development of algorithms and technologies in the field of speech and audio processing. GritTec's research is focused on speech enhancement, speech concealment, voice biometric, speech recognition, speech synthesis and other speech and audio technologies.

### Contacts

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