

VOCAL

iLBC (Internet Low Bitrate Codec)

VOCAL's embedded software libraries include a complete range of ETSI / ITU / IEEE compliant algorithms, in addition to many other standard and proprietary algorithms. Our software is optimized for execution on ANSI C and leading DSP architectures (TI, ADI, AMD, ARM, CEVA, LSI Logic ZSP, and MIPS). These libraries are modular and can be executed as a single task under a variety of operating systems or standalone with its own microkernel.

iLBC (internet Low Bitrate Codec) is designed for narrow band speech and has two supported bit rates. The payload bit rate of 13.33 kbit/s has an encoding frame length of 30 ms while the payload bit rate of 15.20 kbit/s has an encoding frame length of 20 ms. iLBC uses a block-independent linear-predictive coding (LPC) algorithm. When the codec operates at block lengths of 20 ms, it produces 304 bits per block. Similarly, for block lengths of 30 ms it produces 400 bits per block. The two modes for the different frame sizes operate in a very similar way.

The iLBC speech codec is eminently suitable for robust voice communication over IP. The codec smoothly handles the case of lost frames through graceful speech quality degradation; lost frames may often occur in connection with lost or delayed IP packets. Standard low bit rate codecs exploit dependencies between speech frames, which unfortunately result in error propagation when packets are lost or delayed. In contrast, iLBC encoded speech frames are independent and so this problem will not occur. This unique technology gives iLBC robustness against packet loss and delay.

The iLBC algorithm results in a speech coding system with a controlled response to packet loss similar to what is known from pulse code modulation (PCM) with packet loss concealment (PLC). At the same time, the algorithm enables fixed bit rate coding with a quality-versus-bit rate tradeoff close to state-of-the-art. For example, in comparison to G.729A, iLBC yields slightly better voice quality for about the same complexity of algorithms yet also has a higher robustness in dealing with packet loss. Some of the applications for which this coder is suitable are: real time communications such as telephony and videoconferencing, streaming audio, archival, and messaging.

Features

- Bitrate 13.33 kbps for frame size of 30 ms, 15.2 kbps for frame size of 20 ms
- Better packet loss robustness compared to other low-bit rate codecs
- Computational complexity in range of G.729A
- Basic quality higher than G.729A and G.723.1, high robustness to packet loss
- iLBC gives same basic quality as G.729E and exceeds G.729E under packet loss conditions
- Multiple frame sizes give increased flexibility to meet the different needs.
- Gain-shape waveform matching forward in time
- Gain-shape waveform matching backward in time
- Start state encoding
- Pitch enhancement
- Optimized for high performance on leading edge DSP architectures
- Multichannel implementation
- Common compressed speech frame stream interface to support systems with multiple speech coders (G.729, G.728, G.726 et al)
- Can be integrated with G.168 and G.165 echo cancellers, and tone detection/regeneration

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