3.12 Very Low Bit-Rate Speech Coding

**Keywords**

Speech processing; speech coding; very low bit rate real-time speech communication

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**Corporate Sponsorship Program**

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**File reference & version number:**

N/A

**Functional description**

Idiap’s very low bit-rate (VLBR) speech coding system is a conventional speech coder with an acceptable communication delay, designed for real-time speech communication. Cascaded phone-based speech recognition and synthesis systems transmit phonetic and syllabic information, encoded independently, i.e., asynchronously. It operates at an uncompressed bit rate of 213 bits/sec and achieves an average communication delay of 243 ms. A more recent version also uses phonological speech representation instead of phonetic, and is purely based on artificial neural networks, and no hidden Markov models are then used.

**Innovative aspects**

- Speech coding inspired by the human speech signal processing, viz., has explicit simultaneous phonetic and syllabic components, which are asynchronously related.
- The recent version transmits binary phonological speech representation, and thus is more ready for a multi-lingual use.

**Commercial application examples**

End-to-end speech transmission suitable for military and tactical communication systems, and for environments with highly restricted bandwidth, such as under-see communication systems.

**More information**


**Software & IPR status**

Most of the underlying software is open source. Some databases associated with certain languages may require separate agreements.

- [https://gitlab.idiap.ch/milos.cernak/sct-ext](https://gitlab.idiap.ch/milos.cernak/sct-ext)
- [https://gitlab.idiap.ch/milos.cernak/phonovoc](https://gitlab.idiap.ch/milos.cernak/phonovoc)