

Methodology for subjective tests

- Select a number of representative segments for each network scenario
 - Since subjects listening to long recording tend to forget prominent characteristics at the beginning of the recording and focus only on the last seconds of the recording, a 15-second segment duration is chosen to eliminate this effect
 - Representative segments are chosen by computing the Euclidean distance of the entire call and every possible characteristic vector so as to choose the segments that are more close to the network conditions of the call (delay, packet loss, BurstR)
 - Speech material should consist of simple, short and meaningful sentences. Only segments that contain short phrases, intact words and phrases that do not end abruptly are accepted
- Normalize the volume of every segment and upsample them to have the same sampling frequency
 - Volume normalization: speech voltmeter software by ITU
 - Change of sampling frequency: SoX
- Reference samples
 - The original recording (0% packet loss)
 - Recordings with various packet loss uniformly distributed
 - MNRU
 - MPLRU
- Consistency tests
 - 20% of the segments are repeated as a consistency test (control segments)
 - Subjects that grade a control segment with 2 or more points different than the original are excluded
 - Subjects that grade 4 or more control segments differently than the original segments are excluded
- Auditory tests
 - Place the segments in random order
 - Subjects grade the recordings from the various network scenarios and some MPLRU
 - 2-second silence is inserted at the beginning to ensure that the subjects will wait until they listen the next segment (i.e. eliminate recency effects)
 - The length of the auditory test (session) should last ideally no more than 20 minutes and in no case should a session exceed 45 minutes. If the experiment is too large, it should be sub-divided into two or more sessions
 - Grading scale: Listening-quality scale proposed by ITY (MOS scale)
 - Auditory test should be conducted in a room free of echo, reverberations and noise. Use a set of headphones and replay the segments at a fixed volume in order to avoid these effects.

- Questionnaire
 - Must contain instructions
 - Instructions must also be given verbally to the subjects before the tests
 - Questions about procedure or about the meaning of the instructions should be answered
 - Technical questions must not be answered until the experiment is finished
 - An example of instructions to subjects is given in Table B.2/P.800

References

[1] ITU. ITU-T recommendation P.800: Methods for subjective determination of transmission quality, 1996.

[2] A comparative analysis of the perceived quality of VoIP under various wireless network conditions, Hlias Tsompanidis, M. Sc. Thesis, 2010

[3] SoX. SoX - Sound eXchange, 2010. URL <http://sox.sourceforge.net/>.

[4] ITU. ITU-T recommendation G.191: Software tools for speech and audio coding standardization, 2007.