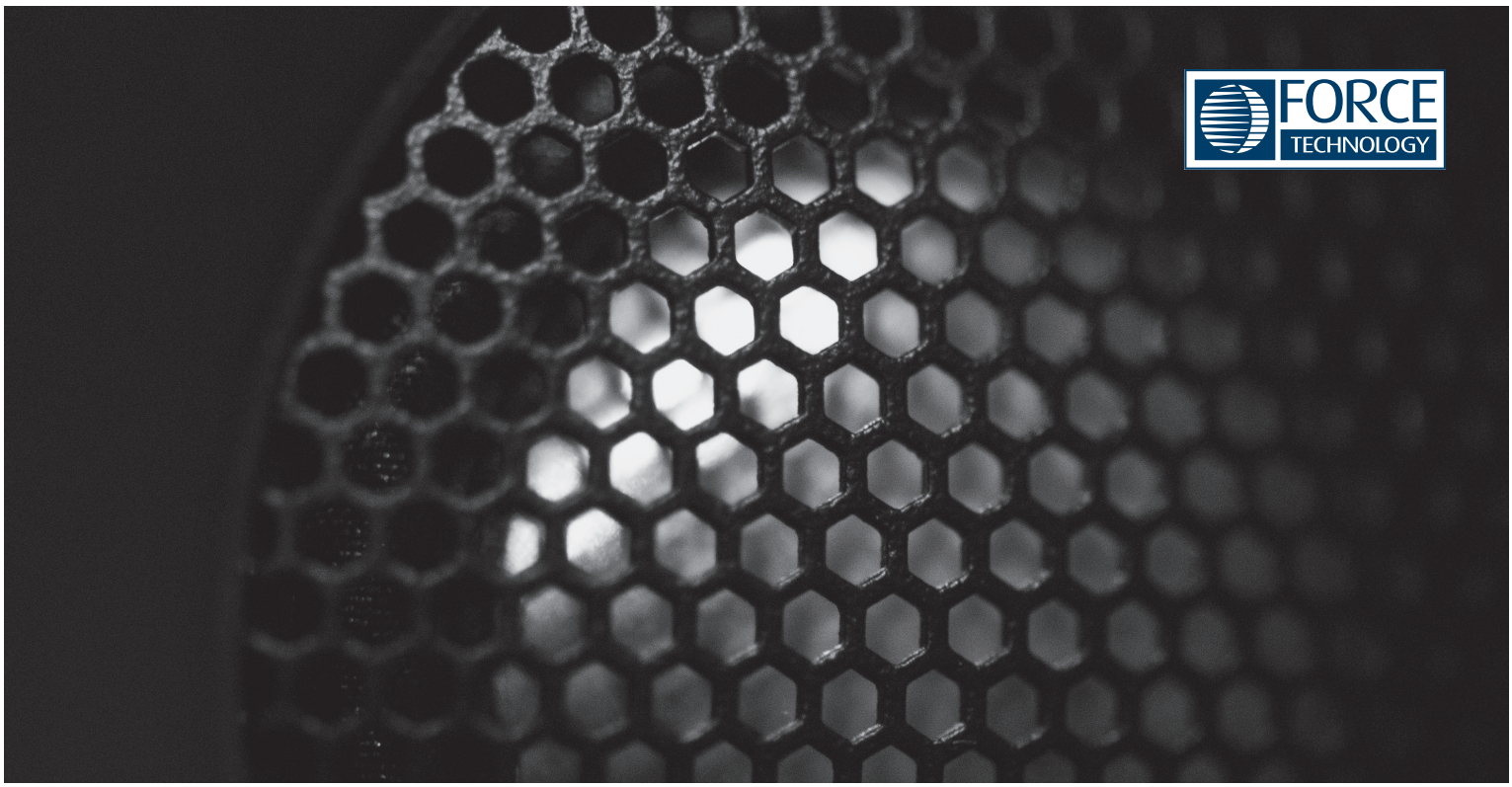


ITU-T P.800 methods

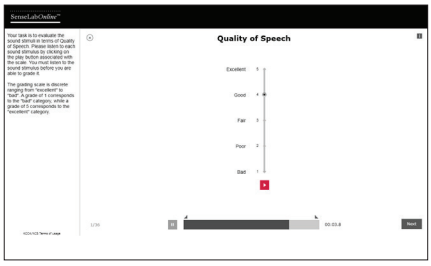
Methods for subjective determination of transmission quality

The ITU-T P.800 recommendation describes a selection of methods suitable for evaluating the perceived transmission quality. It is typically applied in the telecommunications industry for evaluating both analogue and digital systems.

The main methods presented in the ITU-T P.800 include the Absolute Category Rating (ACR), Comparison Category Rating (CCR), and Degradation Category Rating (DCR).

ITU-T P.800 ACR

The ITU-T P.800 Absolute Category Rating (ACR) methodology [1] can be applied in evaluating quality of analogue and digital telecommunication systems.



The SenseLabOnline implementation of the ITU-T P.800 ACR. A system (technology under test) is being rated on the quality of speech.

ACR provides a simple test paradigm for the assessment of stimulus on a single quality scale - or Mean Opinion Score (MOS).

The ITU-T P.800 ACR methodology is mainly applicable in cases where an overall quality rating is sought, and applies one of three test questions:

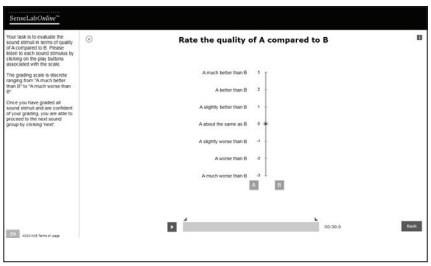
- Quality of speech - assesses the overall listening quality
- Listening effort - effort required to understand the meanings of sentences
- Loudness preference - assesses preferred loudness

Assessors are asked to judge the performance of one sound file on one scale at a time. One test question is used for one test.

ITU-T P.800 CCR

The Comparison Category Rating (CCR) methodology [1] can be applied in evaluation of systems that may improve or degrade speech quality compared to a reference.

The comparison of systems against the reference case allows for highly sensitive assessments between the systems (technology) under test. This means that the methodology allows for testing of systems that perform better than the selected reference case.



The SenseLabOnline implementation of the ITU-T P.800 CCR. A system (technology under test) is being rated on degradation against reference case.

The ITU-T P.800 CCR methodology is mainly applicable in cases where an overall quality rating against a reference case is sought. It is especially useful when the degradation introduced by the systems under test is small.

The ITU-T P.800 CCR applies one question:

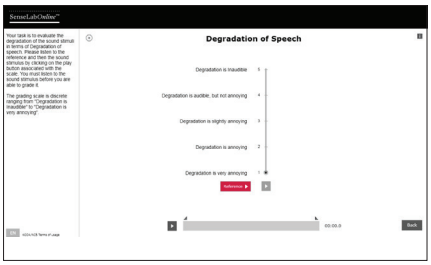
QUALITY OF A AGAINST B - improvement or degradation of quality compared to reference case.

Assessors are presented with a pair of systems (one of which is a hidden reference) for each sample, and asked to rate the test

items against each other on a seven-point categorical comparison category rating scale.

ITU-T P.800 DCR

Degradation Category Rating (DCR) methodology [1] can be applied in evaluation of systems against a reference case. The comparison of systems against the reference case allows for highly sensitive assessmen ts between the systems (technologies) under test. This means that the method can be applied in assessing good quality systems.



The SenseLabOnline implementation of the ITU-T P.800 DCR. A system (technology under test) is being rated on degradation against reference case.

The ITU-T P.800 DCR methodology is mainly applicable in evaluating good quality circuits where a clear reference is available. In the test one test question is applied:

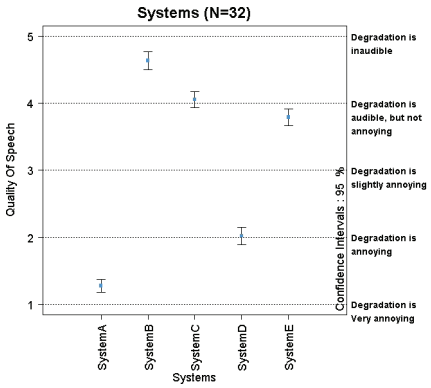
DEGRADATION OF QUALITY - assesses the degradation of quality against a reference.

Assessors are presented with a pair of samples for each item. The reference is clearly identified and assessors are asked to rate the test item against the reference on a 5-point categorical degradation/annoyance category rating scale.

RESULTS AND ANALYSIS

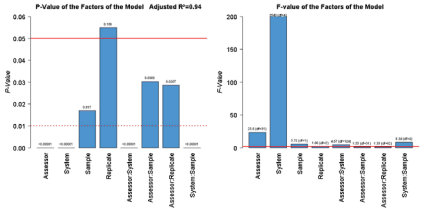
Results from the ITU-T P.800 series tests can be applied in both internal and external validations and benchmarking.

SenseLabOnline's statistical analysis includes all procedures necessary to ensure reliability of the obtained results, using graphs for easy overview of the results.



Mean scores with confidence intervals from an ITU-T P.800 DCR test including 6 systems.

Our standard analysis includes; checking basic assumptions and data quality, plotting of means (incl. confidence intervals) for overall results, 2-way Analysis of Variance (ANOVA) and plots showing interaction between independent variables [2].



Included in our analysis of the ITU-T P.800 CCR is a thorough check e.g. different variables contribution to the results.

ITU-T P.800 SERIES TESTS

- Recommended for use in subjective evaluation of transmission quality.
- Can be applied in both internal and external validation or benchmarking of R&D efforts.
- Performed by naïve assessors (n=32)
- Results can be delivered within 2-3 working days.

[1] ITU-T Recommendation P.800. Methods for subjective determination of transmission quality, 1996. Telecommunication standardization sector of ITU (ITU-T)

[2] Le Ray, G. (2009). Development of a statistical routine with R in the field of audio engineering. (MSc Thesis). AGRO CAMPUS OUEST, France.

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