

# “DIGITIZE IT!”: ON THE DISCRIMINABILITY OF ANALOG VS. HIGH- SAMPLE-RATE DIGITIZED MUSIC RECORDINGS

*Fridolin Stolz<sup>1</sup>*

*Oliver Vitouch<sup>2</sup>*

*Emil Lubej<sup>1</sup>*

<sup>1</sup> Dept. of Musicology, University of Vienna, Austria

<sup>2</sup> Dept. of Psychology, University of Klagenfurt, Austria

## Background

Audio archives all over the world are starting to digitize their audio material. Critics of digital audio technology maintain that digitization will always result in a loss of quality even if “state of the art” A/D and D/A converters are used.

## Aims

This study aimed to test if expert listeners (audio engineers) are able to detect potential impairments in high-quality digitized audio material. This was accomplished in a setting with direct pair-wise comparisons of analog music sequences and their digital transformations.

## Method

An analog source (vinyl) was digitized in real-time (24 bit / 192 kHz with dCS converters) and converted back to analog. Three music samples from different genres (rock/pop, jazz, and classical music; maximum length 25 s) were presented via headphones, five times each, in an A/B pair comparison task (blindfold test with trial-by-trial reference). A was always the analog version; B was either A-repeated or A-transformed. Subjects with professional expertise in the field of audio recording had to judge which version they heard (“twin” or transformation).

## Results

Omnibus performance was at chance level across all 15 comparisons (mean hit rate 7.2). Performance was slightly better, however, and significantly differed from mere guessing in the classical condition (25 s excerpt from Antonin Dvořák’s “Slavonic Dances”; mean hit rate 2.9 out of 5).

## Conclusions

Results demonstrate that even expert listeners cannot reliably discriminate between analog and high-quality coded digital audio material. Still, distinctiveness and task difficulty seem to depend on the type of music, or more precisely on the specific characteristics of the respective audio sequence.