

I. IDENTIFICATION DATA

Thesis title:	Examining the Interrelation and Perceptual Influence of Head-Related Transfer Functions Distance Metrics
Author's name:	Natálie Brožová
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Circuit Theory
Thesis reviewer:	Václav Vencovský
Reviewer's department:	Department of Radioelectronics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment <i>How demanding was the assigned project?</i>	challenging
Please insert your comments here.	

Fulfilment of assignment <i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	fulfilled

Methodology <i>Comment on the correctness of the approach and/or the solution methods.</i>	correct
Wide range of known distance metrics was used. Those were accompanied with listening experiments. Given that only 6 directions (HRTFs for those directions) were employed for a listening test, why the author in addition to the distances averaged across all directions and frequencies do not calculate also distances for the specific directions.	

Technical level <i>Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?</i>	B - very good.
Topic of the thesis is very actual. The author had to employ broad range of expertise including signal processing, statistics, and auditory perception. Unfortunately some parts of the thesis are unclear. I attend these parts in my next comment.	

Formal and language level, scope of thesis <i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	C - good.
Theoretical part and methods could be in some cases better or more clearly explained, e.g., frequency limit for interaural time differences, latin square design. I was not able to understand what the word "fixate" means on page 30: "...it was decided to fixate right ear data...". Some important information is buried inside of the thesis and is not mentioned in the summary/abstract/introduction. Mainly that the listening experiment was conducted by using HRTF data for two subjects and that the listening experiment was not conducted for real HRTF. The thesis could have less typographical errors and formal mistakes like starting a new paragraph after every equation.	

Selection of sources, citation correctness <i>Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?</i>	A - excellent.

Additional commentary and evaluation (optional)

Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

The thesis is focused on analysis of broad range of distance metrics for head related transfer functions (HRTFs). The topic is very actual because HRTFs are essential for proper spatial perception of sound. Due to the complexity of HRTF measurements, individualization techniques are in need. The presented thesis is rich in number of distance metrics used, variety of analysis techniques (PCA, FA, etc.), and number of individual HRTFs. Unfortunately, some parts of the thesis are unclearly written. However, I appreciate that the thesis is written in English. I am also aware that the thesis contains a large amount of work including listening experiments.

Questions:

Your results (Figs 5.6-5.8) seem to hardly show any correlation between the distance metric values and listening test results. Would the result be the same if you calculated distance metrics for the HRTFs in the used directions (directions used for the listening test)?

As I mentioned in my comment above, I am confused with your sentence on page 30: "Thus, for the purpose of the experiment, it was decided to fixate right ear data for both stimuli in order to affect the participant's perception of the stimuli as little as possible." Could you please clearly explain that sentence? In the summary (page 49), you talk about "the right ear advantage presumption". Could not the observed differences be due to the "fixation of the right ear data"?

The grade that I award for the thesis is **B - very good**.

Date: **23.8.2021**

Signature: