

## I. IDENTIFICATION DATA

<b>Thesis title:</b>	<b>Application for Acoustic Signal Localization</b>
<b>Author's name:</b>	<b>Ma Yuchen</b>
<b>Type of thesis :</b>	bachelor
<b>Faculty/Institute:</b>	Faculty of Electrical Engineering (FEE)
<b>Department:</b>	Department of Measurement
<b>Thesis reviewer:</b>	Ing. Jiří Kuře, Ph.D.
<b>Reviewer's department:</b>	Department of Electrical Engineering and Automation, Faculty of Engineering, Czech University of Life Sciences Prague

## II. EVALUATION OF INDIVIDUAL CRITERIA

<b>Assignment</b> <i>How demanding was the assigned project?</i>	<b>challenging</b>
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<b>Fulfilment of assignment</b> <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>	<b>fulfilled</b>
The aims of the work were fulfilled according to the assignment.	

<b>Methodology</b> <i>Comment on the correctness of the approach and/or the solution methods.</i>	<b>correct</b>
The chosen methodology led to the successful implementation an application for sound (event) localization, including a GUI.	

<b>Technical level</b> <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>B - very good.</b>
The technical level of thesis is acceptable. The student used the knowledge described in the theoretical part of the thesis. I cannot assess the use of the student's knowledge acquired during study. The thesis doesn't describe the measured data (recorded sound) for testing the application and the actual data evaluation procedure (timestamp calculation).	

<b>Formal and language level, scope of thesis</b> <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>	<b>B - very good.</b>
The thesis is appropriately divided into chapters and sufficiently extensive. The thesis has minor flaws, such as different sizes/font types or missing letters. Some images are not referred in the text (no obvious context). I cannot assess the formality of the English language.	

<b>Selection of sources, citation correctness</b> <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>	<b>A - excellent.</b>
The thesis contains enough references. I appreciate the use of scientific articles. The references used are correctly listed in the text. Only reference number 2 does not correspond to the standard.	

<b>Additional commentary and evaluation (optional)</b> <i>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.</i>
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I appreciate the thesis's practical focus and the applicability of the results. The student clearly described the issue of sound source localization using the AoA method. Based on literature research, he proposed an algorithm for determining the location of the sound source. The student further dealt with methods of specifying the location of the source of the event and increasing the accuracy. As part of the work, a GUI was created to define input parameters and determine the sound source's location. The application, including the method of using several sensors, was successfully verified.

### 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.*

I appreciate the practical focus of the bachelor thesis and the potential for further use of the results.

The grade that I award for the thesis is **A - excellent**.

#### Questions:

- 1) What test data was used to validate the application? (In what format are the measured data, and what do they contain? - in general)
- 2) How did you determine from the input data when it was a sound event? (from sound wave shape, volume of sound...?)
- 3) In your thesis, you state that for the accuracy of detection, it is essential to know the speed of sound in given environment, which is affected by temperature, pressure, humidity, etc. You must define these parameters and based on these values, set the speed.  
Would it be possible (and how) to auto-calibrate the sound speed parameter automatically for real-time usage?
- 4) Your method (sound event localization) works well in open areas.  
Would it be possible to use this method in closed or rugged areas (For example, a building.)?  
(Yes/Not and why)

Date: **25.1.2024**

Signature: