

I. IDENTIFICATION DATA

Thesis name:	Design of Multimodal Aid for Learning Braille Alphabet
Author's name:	Bc. Martina Klimešová
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Computer Graphics and Interaction
Thesis supervisor:	Ing. Dominika Palivcová
Supervisor's department:	Department of Computer Graphics and Interaction

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	extraordinarily challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
<p>The assignment of the thesis was to explore ways to support the process of learning the braille alphabet by employing olfaction as one of the interaction methods and propose a design of a novel multimodal user interface. To grasp the topic, the author needed to gain excellent initial knowledge in several domains that are not well-mapped and not extensively researched, such as the practices currently used when teaching braille alphabet or employing olfaction in user-interface design. Considering that the interface is also made for a specific and generally hard-to-get visually impaired user audience, I rate this topic as extraordinarily challenging.</p>	

Satisfaction of assignment	fulfilled
<i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	
The assignment was fulfilled, and the extent of the work exceeded initial expectations on the thesis.	

Activity and independence when creating final thesis	A - excellent.
<i>Assess that student had positive approach, time limits were met, conception was regularly consulted and was well prepared for consultations. Assess student's ability to work independently.</i>	
<p>The author actively worked on the topic for almost two years and regularly consulted the progress, which is positively reflected in the high quality of the outcome. The author demonstrated a deep interest in the topic and has proven to be able to work independently.</p>	

Technical level	A - excellent.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
<p>The author gives an excellent example of a well-used User-centered design methodology. The thesis contains a thorough analysis of literature and exploration of the needs of the target user audience. All the methods used in the analysis were correctly chosen, and takeaways were clearly described and mapped. The author cooperated tightly with the visually impaired or experts on the matter during the whole process.</p> <p>In the design phase, the author demonstrated the ability to project the learnings into actual designs. Multiple design iterations were evaluated with the target audience or blindfolded users as it was reasonable for the use-case of the aid. Especially with the high-fidelity prototype, the author showed the ability to implement a multimodal user interface by employing techniques like 3D print and developing an accessible mobile app.</p>	

Formal and language level, scope of thesis	A - excellent.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
<p>The thesis is written in very good English, and it is well-structured into seven main chapters. The topic is nicely described on 63 pages and illustrated adequately by figures, which helps better understand the process and the author's decisions.</p>	

Selection of sources, citation correctness**A - excellent.**

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

The author uses various sources and states citations correctly. Especially in the analysis part, the author provides a great overview of relevant scientific papers and uses them properly to shape her work.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation.

I evaluate this thesis as exceptional from several perspectives. The text itself surpasses comparable works in extent and scientific quality. The author provides a great example of the usage of formative evaluation to develop an efficient design for a specific user group. The clarity of the used methods for evaluation makes the outcomes generalizable and potentially interesting for the HCI community, mainly because of atypical and novel usage of olfaction for the interaction with the aid. Furthermore, the aid has a great potential to be put into practical use. I would like to ask the committee to nominate this thesis for an award.

Questions for defense:

- One of the aspects that were considered when designing the interface was affordability. How does the new aid compare to existing aids for learning the braille alphabet when it comes to its estimated price?

I evaluate handed thesis with classification grade **A - excellent**.

Date: **14.1.2022**

Signature: