



# Supervisor's statement of a final thesis

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**Student:** Ernesto Iván Ochoa Hidalgo  
**Thesis title:** Real-Time Assistance for Visually Impaired Individuals  
**Branch / specialization:** Software Engineering 2021  
**Created on:** 17 May 2023

## Evaluation criteria

### 1. Fulfillment of the assignment

- ▶ [1] assignment fulfilled
- [2] assignment fulfilled with minor objections
- [3] assignment fulfilled with major objections
- [4] assignment not fulfilled

The objectives of the thesis, as specified in the assignment, have been fulfilled correctly and completely. The development of this work has been driven by the demand of visually impaired members of the SONS organization, who were missing an online assistance application for navigation in unstructured environments. There were no solutions available that would meet the requirements of the users, which implies that this thesis deals with a challenge that has not been solved yet. Addressing the drawbacks of the existing solutions brings a clear benefit to the community. The results go beyond the design and implementation of a prototype, providing an application that is ready to be used in real life by visually impaired users.

### 2. Main written part

99/100 (A)

The thesis is well-structured and easy to read. The content is logically divided into chapters and sections describing the existing applications, listing their drawbacks, and exploring the potential solutions. The central part of the thesis is formed by the description of the final solution. The text covers important technical details, including diagrams, code snippets, and application screenshots. A valuable component of the thesis is also the summary of the feedback from several meetings with the SONS members. While the thesis is relatively concise, it contains all the essential and relevant information in sufficient detail. It is written in correct English, with minimum grammar or typographical errors. The bibliography comprises mostly online resources, which is expectable for a software project like this one. All resources are relevant and adequately cited in the text.

### **3. Non-written part, attachments**

98 /100 (A)

The application, which has been developed as a result of this work, provides support to visually impaired users by connecting them with fully-sighted users, offering assistance with navigation and other tasks. Through the application's smart design, the candidate was able to integrate all the functionality for both parties, the visually impaired user and the fully-sighted assistant, into a single application. The application offers bidirectional audio and unidirectional video connection at its core. Furthermore, it allows for high-definition still image sharing, and it features additional functionalities such as a video resolution setting to control the tradeoff between bandwidth use and picture quality, which can be configured by both parties in real time. The multi-platform design allows for cross-platform connection and supports various devices, operating systems, and can be used within a web browser or as a standalone Android or iOS application. The application flow and layout are well-designed, and the user interface is fully accessible, as confirmed by the SONS users during several testing rounds.

### **4. Evaluation of results, publication outputs and awards**

97 /100 (A)

This Master's project resulted in an application that has been tested in several rounds by visually impaired users. The application development consisted of continual prototype testing, which led to the gradual refinement of the frameworks and technologies used to achieve the desired functionality. The testing has been performed in close collaboration with the SONS organization, which guarantees that the application is tailored to the target group's needs. The application is ready to be used in real-world scenarios and fulfill the needs of visually impaired users. One of its main strengths and, at the same time, one of the largest challenges is its multi-platform support, which allows the application to run on various devices, platforms, and operating systems. While the application is functional, fully usable, and ready to be deployed for real-world use in its present state, another round of testing would probably help further improve the reliability of the service even in less common scenarios. The candidate plans to continue the application development and support in agreement with SONS.

### **5. Activity of the student**

- ▶ [1] excellent activity
- [2] very good activity
- [3] average activity
- [4] weaker, but still sufficient activity
- [5] insufficient activity

I would evaluate my overall experience with the candidate's activity as smooth and rewarding. He was very active, committed, well-prepared for our weekly meetings, and met all the internal deadlines we set to track the progress. Moreover, he took the initiative to meet regularly with the SONS members, who provided valuable feedback on the application design and tested the prototype throughout its development cycle.

### **6. Self-reliance of the student**

- ▶ [1] excellent self-reliance

- [2] very good self-reliance
- [3] average self-reliance
- [4] weaker, but still sufficient self-reliance
- [5] insufficient self-reliance

The candidate proved an excellent ability to work independently, creatively address the challenges throughout the development, and set up the work plan by himself.

## **The overall evaluation**

**98** /100 (A)

The objectives of the thesis have been fulfilled. The thesis is well-structured, easy to follow, and describes the proposed solution in sufficient detail. The developed application provides navigation support to visually impaired users and offers functionality tailored to their needs. It has been tested and refined in close collaboration with the SONS organization and it is ready to be deployed for real-world use. The candidate has been active, motivated, committed, and able to work independently and creatively address the challenges throughout the development. Overall, the candidate's work meets the high standard I would expect from an excellent Master's project.

## **Instructions**

### **Fulfillment of the assignment**

Assess whether the submitted FT defines the objectives sufficiently and in line with the assignment; whether the objectives are formulated correctly and fulfilled sufficiently. In the comment, specify the points of the assignment that have not been met, assess the severity, impact, and, if appropriate, also the cause of the deficiencies. If the assignment differs substantially from the standards for the FT or if the student has developed the FT beyond the assignment, describe the way it got reflected on the quality of the assignment's fulfilment and the way it affected your final evaluation.

### **Main written part**

Evaluate whether the extent of the FT is adequate to its content and scope: are all the parts of the FT contentful and necessary? Next, consider whether the submitted FT is actually correct – are there factual errors or inaccuracies?

Evaluate the logical structure of the FT, the thematic flow between chapters and whether the text is comprehensible to the reader. Assess whether the formal notations in the FT are used correctly. Assess the typographic and language aspects of the FT, follow the Dean's Directive No. 52/2021, Art. 3.

Evaluate whether the relevant sources are properly used, quoted and cited. Verify that all quotes are properly distinguished from the results achieved in the FT, thus, that the citation ethics has not been violated and that the citations are complete and in accordance with citation practices and standards. Finally, evaluate whether the software and other copyrighted works have been used in accordance with their license terms.

### **Non-written part, attachments**

Depending on the nature of the FT, comment on the non-written part of the thesis. For example: SW work – the overall quality of the program. Is the technology used (from the development to deployment) suitable and adequate? HW – functional sample. Evaluate the technology and tools used. Research and experimental work – repeatability of the experiment.

### **Evaluation of results, publication outputs and awards**

Depending on the nature of the thesis, estimate whether the thesis results could be deployed in practice; alternatively, evaluate whether the results of the FT extend the already published/known results or whether they bring in completely new findings.

### **Activity of the student**

From your experience with the course of the work on the thesis and its outcome, review the student's activity while working on the thesis, his/her punctuality when meeting the deadlines and whether he/she consulted you as he/she went along and also, whether he/she was well prepared for these consultations.

### **Self-reliance of the student**

From your experience with the course of the work on the thesis and its outcome, assess the student's ability to develop independent creative work.

### **The overall evaluation**

Summarize which of the aspects of the FT affected your grading process the most. The overall grade does not need to be an arithmetic mean (or other value) calculated from the evaluation in the previous criteria. Generally, a well-fulfilled assignment is assessed by grade A.