

This is the Title of my Thesis

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PROJECT THESIS

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Norwegian University of Science and Technology

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Supervisor 2: The co-supervisors (internal and external)

Preface

Here, you give a brief introduction to your work. What it is (e.g., a Master's thesis in RAMS at NTNU as part of the study program xxx and. . .), when it was carried out (e.g., during the autumn semester of 2021). If the project has been carried out for a company, you should mention this and also describe the cooperation with the company. You may also describe how the idea to the project was brought up.

You should also specify the assumed background of the readers of this report (who are you writing for).

Trondheim, 2012-12-16

(Your signature)

Ola Nordmann

Acknowledgment

I would like to thank the following persons for their great help during ...

If the project has been carried out in cooperation with an external partner (e.g., a company), you should acknowledge the contribution and give thanks to the involved persons.

You should also acknowledge the contributions made by your supervisor(s).

O.N.

(Your initials)

Remark:

Given the opportunity here, the RAMS group would recognize Professor Emeritus Marvin Rausand for the work to prepare this template. Some minor modifications have been proposed by Professor Mary Ann Lundteigen, but these are minor compared to the contribution by Rausand.

Executive Summary

Here you give a summary of your work and your results. This is like a management summary and should be written in a clear and easy language, without many difficult terms and without abbreviations. Everything you present here must be treated in more detail in the main report. You should not give any references to the report in the summary – just explain what you have done and what you have found out. The Summary and Conclusions should be no more than two pages.

You may assume that you have got three minutes to present to the Rector of NTNU what you have done and what you have found out as part of your thesis. (He is an intelligent person, but does not know much about your field of expertise.)

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Chapter 1

Introduction

1.1 Background

Problem Formulation / Motivation / Purpose?

Related work

SphenoBlock

What Remains to be Done?

1.2 Objectives / Research Questions

What follow are the research questions which motivates this project:

Main RQ: How can AR support teaching of rat brain anatomy and dissection for medical students?

- **RQ1:** How should interaction in be implemented in AR to accommodate medical professionals?
- **RQ2:** How will a collaborative experience shared between an HMD and a smartphone compare to accommodate medical professionals?
- **RQ3:** Something about macro + microscopic visualization: How should microscopical data be visualized in a macroscopical model to best effect? (WIP)

1.3 Approach

Research method

The research questions were derived through discussing the needs of the intended users with neuroscientists at the Kavli Institute. It was then narrowed down by a literature review, finding a lack of satisfactory substitutions for real brain dissections and especially finding no attempt at a practical multiplatform application for a more scalable use for students. The project's research question falls under the strategy of Design and Creation as the main goal is to develop a useful application for medical education. The focus on a smartphone solution was further motivated by the COVID-pandemic making from-home learning quite essential and making the passing around of HMD devices an unwanted scenario. As part of an agile software development model the gathering of qualitative data from observations and interviews within the scope of user testing will be essential.

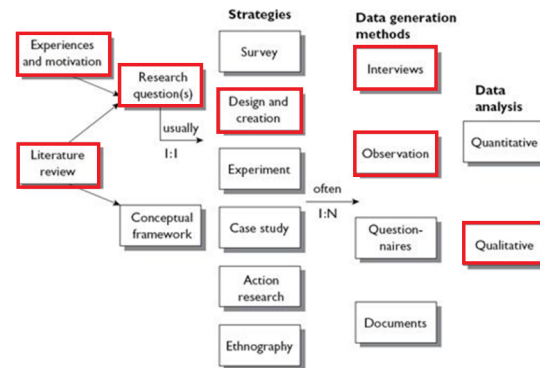


Figure 1.1: Model of the research process as illustrated in (Oates, 2006)

Development method

1.4 Contributions

The research product resulting from this project will be a new computer-based software application using augmented reality and running on multiple platforms like HoloLens 1 and 2, Android and more. The aim will be to develop an application that can bridge the gap between expensive head mounted displays and everyday smartphones which you will find in the pocket of any student, and to use this as a collaborative tool for learning neuroanatomy. Throughout the development period we will consult with medical professionals and gather feedback from students on the usability of the application.

1.5 Limitations

1.6 Outline

Chapter 2

Conclusions, Discussion, and Recommendations for Further Work

2.1 Summary and Conclusions

2.2 Discussion

2.3 Recommendations for Further Work

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Appendix A

Acronyms

NTNU Norwegian University of Science and Technology

AR Augmented Reality

MR Mixed Reality

XR Extended Reality

VR Virtual Reality

HMD Head-mounted display

GPU Graphics Processing Unit

SDK Software Development Kit

Appendix B

What to put in appendixes

This is an example of an Appendix. You can write an Appendix in the same way as a chapter, with sections, subsections, and so on. An appendix may include list of code (in case you are programming), more details about results that you have presented in the report (could be a more complete description of results, in case you decided to focus on the most important ones in the main report), supplementary information and descriptions you have found relating to the system you are analysing, such as drawings. You may discuss with your supervisor what are relevant information for appendixes.

B.1 Introduction

B.1.1 More Details

Bibliography

Oates, B. (2006). *Researching Information Systems and Computing*. SAGE Publications.