UP Tap

A Special Problem Proposal
Presented to
the Faculty of the Division of Physical Sciences and Mathematics
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In Partial Fulfillment
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Bachelor of Science in Computer Science by

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Abstract

The UP System started deployment of RFID/NFC-enabled UP ID in 2019. 5 years later, we have yet to see a system that fully utilizes the technology embedded in the UP ID. In particular, we see a great potential in using it as an access key for tracking the attendance of students in their classes. Professors currently either use the traditional pen and paper or a spreadsheet in their laptops to check for attendance. The mentioned practices are prone to forgery and takes precious time away from the class period.

Our paper proposes a fully digital attendance tracking system that can be used by professors to record the attendance of their students in real time. The system uses UP ID and facial recognition for a two-layer validation process ensuring accuracy of the records. Facial recognition uses a pretrained Facenet model that surpasses human beings in multiple facial recognition tests. The attendance process includes students aligning their face in the camera, and tapping their ID to the RFID/NFC reader. The current prototype takes only about 2-3 seconds to complete the whole validation and recording process, with more room for optimizations down the line.

Suggested keywords based on ACM Computing Classification system can be found at `https://dl.acm.org/ccs/ccs_flat.cfm`

Keywords: Keyword 1, keyword 2, keyword 3, keyword 4, etc.

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Chapter 1

Introduction

1.1 Overview

This section gives the reader an overview of the real world problem that needs to be solved. It describes the exigency of the proposed solution. The consequences to the affected stakeholders that the problem may bring if it not addressed. Discussion must not be too technical or too detailed.

This section ends with a discussion on the problem/s faced by or that still exist in the specific technology or field (e.g., limitations of existing software or algorithms). The problem statement would lead to the research objectives.

It is easy to include a figure in JPG or PNG format as shown in the following example. Make sure that you explain what the figure is all about, and that you refer to your figure. For example, Figure 1.1 shows a graph of the performance of Disney stock from the 1980s to 2012.

Some notes on citing references. When using APA format, the author-date method of citation is followed. This means that the author's last name and the year of publication for the source should appear in the text, and a complete reference should appear in the reference list.

Here are some examples on how to do the referencing (note author's name and years are different from commented examples). For APA citation details, refer to `http://www.ctan.org/tex-archive/biblio/bibtex/contrib/apacite/`.

- Kartch (2000) compared reaction times...

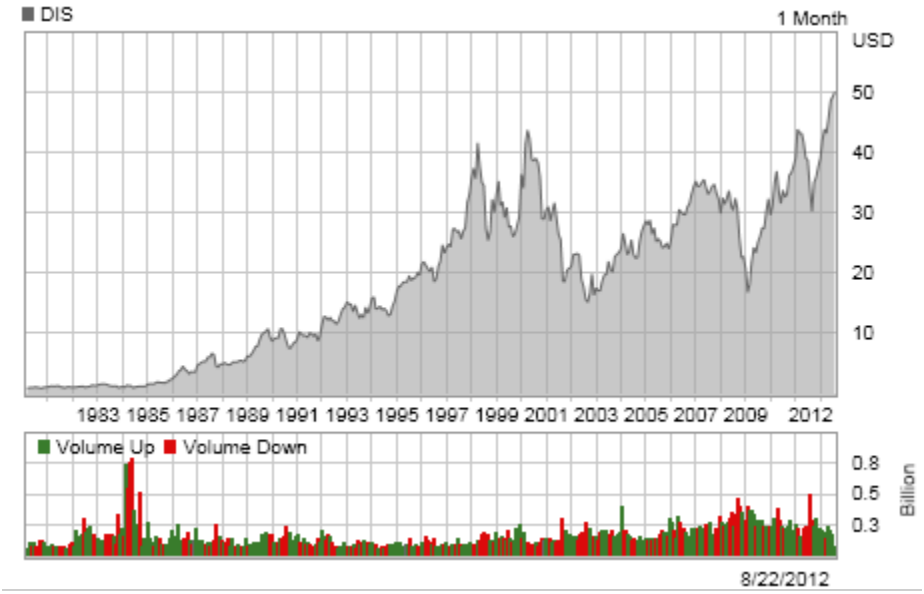

Figure 1.1: This is the figure's caption – Disney stock chart. Captions should fully describe the figure in a concise manner such that there is not need to refer to the text when figuring out the graphic.

- In a recent study of reaction times (Kartch, 2000)...
- In 2000, Kartch compared reaction times...
- Fedkiw et al. (2001) compared reaction times...
- In a recent study of reaction times (Fedkiw et al., 2001)...
- In 2001, Fedkiw et al., compared reaction times...

The following are references from journal articles (Park, Linsen, Kreylos, Owens, & Hamann, 2006; Pellacini et al., 2005; Sako & Fujimura, 2000). Here's an MS thesis document (Yee, 2000), and this is from PhD dissertation (Kartch, 2000). For a book, reference is given as (Parke & Waters, 1996). Proceedings from a conference samples are (Jobson, Rahman, & Woodell, 1995; Fedkiw et al., 2001; Levoy et al., 2000). The sample bibliography file named **myreferences.bib** is from the SIGGRAPH LaTeX template. You can use a text editor to view the contents of the bib file. It is your task to create your own bibliography file. For those who downloaded papers from ACM or IEEE sites, there is a BibTeX link that you can click; thereafter, you just simply need to copy and paste the BibTeX entry into your own bibliography file.

The following shows how to include a program source code (or algorithm). The verbatim environment, as the name suggests, outputs text (including white spaces) as is...

```
#include <stdio.h>
main()
{
     printf("Hello world!\n");
}
```

Alternatively, you can also use the *lstlisting* environment from the **listings** package.

1.2 Problem Statement

DO NOT FORGET to write the statement of the research problem here, i.e., before the Research Objectives.

A problem statement is your research problem written explicitly. The problem statement should do four things:

1. Specify and describe the problem (with appropriate citations)
2. Provide evidence of the problem's existence
3. Explain the consequences of NOT solving the problem
4. Identify what is not known about the problem that should be known.
5. Subdivide the main problem into several subproblems.

1.3 Research Objectives

1.3.1 General Objective

This subsection states the over–all goal that must be achieved to answer the problem. Address the following: Given your research challenge or opportunity, how do you intend to solve it? What is the output of your research?

1.3.2 Specific Objectives

This subsection is an elaboration of the general objective. It states the specific steps that must be undertaken to accomplish the general objective. These objectives must be **S**pecific, **M**easurable, **A**ttainable, **R**ealistic, **T**ime-bounded. Also, they are manageable and communicable.

A specific objective start with "to <verb>" for example: to design/survey/review/analyze.

Studying a particular programming language or development tool (e.g., to study Windows/Object-Oriented/Graphics/C++ programming) to accomplish the general objective is inherent in all thesis and, therefore, must not be included here.

1. To compare and contrast existing algorithms (on what problem?);
2. To develop a new algorithm (for what purpose?)
3. To analyze the algorithm (based on what criteria?)

1.4 Scope and Limitations of the Research

This section discusses the boundaries (with respect to the objectives) of the research and the constraints within which the research will be developed.

1.5 Significance of the Research

This section explains why research must be done in this area. It rationalizes the objective of the research with that of the stated problem. Avoid including sentences such as "This research will be beneficial to the proponent/department/college" as this is already an inherent requirement of all BSCS majors. Focus on the research's contribution to the Computer Science field.

The following are guide questions that may help your formulate the significance of your research.

- What is the relevance of your work to the computer science community?

  - What will be your technical contributions, in terms of algorithms, or approaches, or new domain?
  - What is your value-added compared to existing systems?

- What will be your contributions to society in general?
  - Who will benefit from your system?
  - Who are your target users and how will this system benefit them?

Chapter 2

Review of Related Literature

This chapter discusses the features, capabilities, and limitations of existing research, algorithms, or software that are related/similar to the Special Problem.

The reviewed works and software must be arranged either in chronological order, or by area (from general to specific). Observe a consistent format when presenting each of the reviewed works. This must be selected in consultation with the adviser.

DO NOT FORGET to cite your references.

A literature review must do these things:

- be organized around and related directly to the thesis or research question you are developing
- synthesize results into a summary of what is and is not known
- identify areas of controversy in the literature
- formulate questions that need further research

A literature review is a piece of discursive prose, not a list describing or summarizing one piece of literature after another. It's usually a bad sign to see every paragraph beginning with the name of a researcher. Instead, organize the literature review into sections that present themes or identify trends, including relevant theory. You are not trying to list all the materials published, but to synthesize and evaluate them according to the guiding concept of your thesis or research question. You should also state the limits or gaps of their researches wherein you will try to fill these gaps in accordance to your research problem and objectives.

2.1 Theme 1 Title

This chapter contains a review of research papers that:

- Describes work on a research area that is similar or relevant to yours
- Describes work on a domain that is similar or relevant to yours
- Uses an algorithm that may be useful to your work
- Uses a software / tool that may be useful to your work

It also contains a review of software systems that:

- Belongs to a research area similar to yours
- Addresses a need or domain similar to yours
- Is your predecessor

2.2 Theme 2 Title

2.3 Chapter Summary

Should include a table of related studies comparing them based on several criteria.

Highlight research gaps and the research problem.

Chapter 3

Research Methodology

This chapter lists and discusses the specific steps and activities that will be performed to accomplish the project. The discussion covers the activities from pre-proposal to Final SP Writing.

3.1 Research Activities

Research activities include inquiry, survey, research, brainstorming, canvassing, consultation, review, interview, observe, experiment, design, test, document, etc. Be sure that for each method, process, or algorithm used, there is a justification why that method was chosen. The methodology also includes the following information:

- who is responsible for the task
- the resource person to be contacted
- what will be done
- when and how long will the activity be done
- where will it be done
- why should be activity be done

DO NOT FORGET to cite your references.

3.2 Calendar of Activities

A Gantt chart showing the schedule of the activities should be included as a table. For example:

Table 3.1 shows a Gantt chart of the activities. Each bullet represents approximately one week worth of activity.

Table 3.1: Timetable of Activities

Activities (2009)	Jan	Feb	Mar	Apr	May	Jun	Jul
Study on Prerequisite Knowledge			●●	●●●●			
Review of Existing Racing Strategies	●●	●●●●	●●●●	●●●●			
Identification of Best Features				●●●●	●●		
Development of Racing Strategies				●●	●●●●	●●	
Simulation of Racing Strategies				●●	●●●●	●●●	
Analysis and Interpretation of the Results					●●●●	●●●●	●
Documentation	●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●

Chapter 4

Preliminary Results/System Prototype

This chapter presents the preliminary results or the system prototype of your SP. Include screenhots, tables, or graphs and provide the discussion of results.

References

Fedkiw, R., Stam, J., & Jensen, H. W. (2001). Visual simulation of smoke. In E. Fiume (Ed.), *Proceedings of siggraph 2001* (pp. 15–22). ACM Press / ACM SIGGRAPH.

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Sako, Y., & Fujimura, K. (2000). Shape similarity by homotropic deformation. *The Visual Computer*, *16*(1), 47–61.

Yee, Y. L. H. (2000). *Spatiotemporal sensistivity and visual attention for efficient rendering of dynamic environments* (Unpublished master's thesis). Cornell University.

Appendix A

Appendix Title

Appendix B

Resource Persons

Mr. Firstname1 Lastname1
Role1
Affiliation1
emailaddr1@domain.com

Ms. Firstname2 Lastname2
Role2
Affiliation2
emailaddr2@domain.net

....