Title of thesis

by

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A thesis submitted to the Graduate Council of Texas State University in partial fulfillment of the requirements for the degree of Master of Science with a Major in Computer Science

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LIST OF ABBREVIATIONS(OPTIONAL)

API Application Programming Interface

UML Unified Modeling Language

ABSTRACT

Indent and begin typing the abstract. The abstract is a continuous summary, not disconnected note or an outline, and is brief and to the point. The text of the abstract is double-spaced or one and one-half spaced. The abstract may continue on to additional pages.

I. INTRODUCTION

This template for LaTeX is designed to make formatting your thesis as painless as possible.

Organization

A very important factor for successful thesis writing is the organization of the material. This template suggests a structure as the following:

- `Chapters/` is where all the "real" content goes in separate files such as `Chapter01.tex` etc.
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- `ClassicThesis.tex`: the main file of your thesis where all gets bundled together.

- `classicthesis-config.tex`: a central place to load all nifty packages that are used. In there, you can also activate backrefs in order to have information in the bibliography about where a source was cited in the text (i. e., the page number). *Make your changes and adjustments here.* You also adjust the title of your thesis, your name, and all similar information here.

In total, this should get you started in no time.

Citations

In-text citations are fairly straightforward:

1. Standard citation. (Bringhurst, 2008, p. 123)

2. According to Donald Knuth (1976), the "C language rocks". (p. 12)

test subsection

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II. EXAMPLES

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Static	2.4800	9.9037	4.0644	16.2538
Default	2.9132	11.6461	5.4368	21.7393
Dynamic	2.4965	9.8905	4.0690	16.2200
Guided	2.4880	9.8922	4.0565	16.2162

Table II.1: Runtimes

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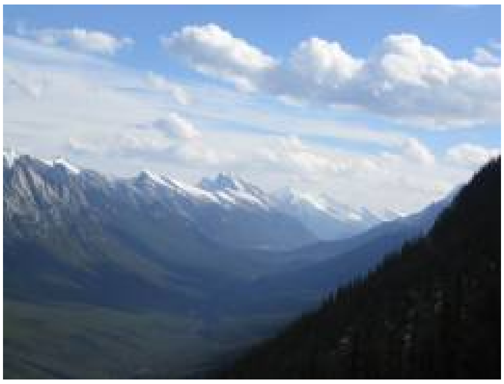
(a) Asia personas duo.

(b) Pan ma signo.



(c) Methodicamente o uno.

(d) Titulo debitas.

Figure II.1: Tu duo titulo debitas latente.

III. MATH TEST CHAPTER

Ei choro aeterno antiopam mea, labitur bonorum pri no. His no decore nemore graecis. In eos meis nominavi, liber soluta vim cu. Sea commune suavitate interpretaris eu, vix eu libris efficiantur.

Some Formulas

Due to the statistical nature of ionisation energy loss, large fluctuations can occur in the amount of energy deposited by a particle traversing an absorber element[1]. Continuous processes such as multiple scattering and energy loss play a relevant role in the longitudinal and lateral development of electromagnetic and hadronic showers, and in the case of sampling calorimeters the measured resolution can be significantly affected by such fluctuations in their active layers. The description of ionisation fluctuations is characterised by the significance parameter κ, which is proportional to the ratio of mean energy loss to the maximum allowed energy transfer in a single collision with an atomic electron:

$$\kappa = \frac{\xi}{E_{\max}} \tag{III.1}$$

[1] Examples taken from Walter Schmidt's great gallery: `http://home.vrweb.de/~was/mathfonts.html`

E_{max} is the maximum transferable energy in a single collision with an atomic electron.

$$E_{\mathrm{max}} = \frac{2m_{\mathrm{e}}\beta^2\gamma^2}{1 + 2\gamma m_{\mathrm{e}}/m_{\mathrm{x}} + (m_{\mathrm{e}}/m_{\mathrm{x}})^2} \ ,$$

where $\gamma = E/m_{\mathrm{x}}$, E is energy and m_{x} the mass of the incident particle, $\beta^2 = 1 - 1/\gamma^2$ and m_{e} is the electron mass. ξ comes from the Rutherford scattering cross section and is defined as:

$$\xi = \frac{2\pi z^2 e^4 N_{\mathrm{Av}} Z \rho \delta x}{m_{\mathrm{e}}\beta^2 c^2 A} = 153.4 \frac{z^2}{\beta^2}\frac{Z}{A}\rho\delta x \quad \mathrm{keV},$$

where

z	charge of the incident particle
N_{Av}	Avogadro's number
Z	atomic number of the material
A	atomic weight of the material
ρ	density
δx	thickness of the material

κ measures the contribution of the collisions with energy transfer close to E_{max}. For a given absorber, κ tends towards large values if δx is large and/or if β is small. Likewise, κ tends towards zero if δx is small and/or if β approaches 1.

The value of κ distinguishes two regimes which occur in the description of ionisation fluctuations:

1. A large number of collisions involving the loss of all or most of the incident particle energy during the traversal of an absorber.

   As the total energy transfer is composed of a multitude of small energy losses, we can apply the central limit theorem and describe the fluctuations by a Gaussian distribution. This case is applicable to non-relativistic particles and is described by the inequality $\kappa > 10$ (i. e., when the mean energy loss in the absorber is greater than the maximum energy transfer in a single collision).

2. Particles traversing thin counters and incident electrons under any conditions.

   The relevant inequalities and distributions are $0.01 < \kappa < 10$, Vavilov distribution, and $\kappa < 0.01$, Landau distribution.

Various Mathematical Examples

If $n > 2$, the identity

$$t[u_1, \ldots, u_n] = t\big[t[u_1, \ldots, u_{n_1}], t[u_2, \ldots, u_n]\big]$$

defines $t[u_1, \ldots, u_n]$ recursively, and it can be shown that the alternative definition

$$t[u_1, \ldots, u_n] = t\big[t[u_1, u_2], \ldots, t[u_{n-1}, u_n]\big]$$

gives the same result.

APPENDIX SECTION

APPENDIX A

Insert supplementary material here.

REFERENCES

Bentley, J. (1999). *Programming Pearls*. Addison–Wesley, Boston, MA, USA, 2nd edition.

Bringhurst, R. (2008). *The Elements of Typographic Style*. Version 3.2. Hartley & Marks Publishers, Point Roberts, WA, USA.

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