Thesis Template: Latex Template for GCUF Thesis

By Muhammad Murad Khan 2014-GCUF-S00576

Thesis submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY IN COMPUTER SCIENCE



DEPARTMENT OF COMPUTER SCIENCE GOVERNMENT COLLEGE UNIVERSITY, FAISALABAD.

March, 2021



DEDICATED TO MY BELOVED PROPHET (PEACE BE UPON HIM) AND MY BELOVED MOTHER

DECLARATION

The work presented in this thesis was accomplished by me under the supervision of

Dr. Roliana Ibrahim, Assistant Professor, Computer ScienceDepartment, GC University

Faisalabad, Pakistan.

I hereby declare that the title of thesis "THESIS TEMPLATE: LATEX TEMPLATE FOR

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In the name of Allah Almighty, the Most beneficial and the Most merciful, Who is creator of learning, without His relentless help we cannot follow right way. I salute and present Darood on my beloved and ideal Holly Prophet Muhammad (peace be upon him) whose life is lite for adrift people.

As an issue of my first significance, I offer my sincerest regards and heart-felt regards to my supervisor **Dr. Muhammad Imran**, a collaborator, humble and an efficient teacher, who guided and kept me up all through my research work with resistance and learning. Clearly, it included pride to look at under his kind heading. He is like a window through which i can see my future. He always stayed around along with students in all rainy day. I feel extremely supported to take this chance to express my profound feelings of indebt to my excellent supervisor.

I am obliged to all my well behaved instructors and guiders whose education and guiding points helped me a lot to reach the phase of scholastic peak and also for their unique care and worry amid my stay in the institution. It involves extraordinary charm and respect for me to express my appreciation and thankfulness to my teachers for their kind and academic direction, fascination and steady encouragement.

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Furthermore, I am thankful to my **Mother**, for bringing forth me at early spot, helping me profoundly for the duration of my life. I could never have possessed the capacity to stay today without her persistent supplications and offer assistance. Her nonstop petitions are dependably with me at each progression of my life. Likewise on account of my siblings for their interminable affection and encouragement.

It is unrealistic for me to name each and every of the individuals who have contributed, specifically or by implication, towards the compeleting of my work. I am very grateful to all my well-wishers for their genuine backing. At the end I again thankful to my Allah Almighty to give me power and strength to complete this research work for my M-Phil maths.

Sawaira Shafique

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LIST OF ABBREVIATIONS

- au Cauchy stress tensor
- I Identity tensor
- 3 Integral transform

ABSTRACT

The goal of this work is to find out the

Chapter 1

IEEE Template

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1.1 Ease of Use

1.1.1 Maintaining the Integrity of the Specifications

The IEEEtran class file is used to format your paper and style the text. All margins, column widths, line spaces, and text fonts are prescribed; please do not alter them. You may note peculiarities. For example, the head margin measures proportionately more than is customary. This measurement and others are deliberate, using specifications that anticipate your paper as one part of the entire proceedings, and not as an independent document. Please do not revise any of the current designations.

1.2 Prepare Your Paper Before Styling

Before you begin to format your paper, first write and save the content as a separate text file. Complete all content and organizational editing before formatting. Please note sections 2.2.1–2.2.5 below for more information on proofreading, spelling and grammar.

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$$a + b = \gamma \tag{1.2.1}$$

Be sure that the symbols in your equation have been defined before or immediately following the equation. Use "(2.2.1)", not "Eq. (2.2.1)" or "equation (2.2.1)", except at the beginning of a sentence: "Equation (2.2.1) is . . ."

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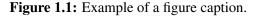


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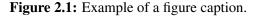


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REFERENCES

- Eason, G., Noble, B., and Sneddon, I. N. (1955). On certain integrals of lipschitz-hankel type involving products of bessel functions. *Philosophical Transactions of the Royal Society of London. Series A, Mathematical and Physical Sciences*, 247(935):529–551.
- Kotiuga, P. R. (1987). On making cuts for magnetic scalar potentials in multiply connected regions. *Journal of Applied Physics*, 61(8):3916–3918.
- Medina, V., Valdes, R., Azpiroz, J., and Sacristan, E. (2007). Title of paper if known [j]. *Management Science*, 25(4):240–254.
- Meiklejohn, W. (1962). Exchange anisotropy—a review. *Journal of Applied Physics*, 33(3):1328–1335.
- Nicole, R. (1987). Title of paper with only first word capitalized, j. Name Stand. Abbrev.
- Yorozu, T., Hirano, M., Oka, K., and Tagawa, Y. (1987). Electron spectroscopy studies on magneto-optical media and plastic substrate interface. *IEEE translation journal on magnetics in Japan*, 2(8):740–741.
- Young, M. (2002). *The technical writer's handbook: writing with style and clarity*. University Science Books.