Tribhuvan University
Institute of Science and Technology

A Research Proposal on
[Title of the Research Proposal]

Submitted by

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Under the Supervision of

[Supervisor Name(s)]

Submitted to

School of Mathematical Sciences

Kirtipur, Kathmandu, Nepal

Submitted in partial fulfillment of the requirements for the degree of Master in Data Science

[Month, Year]

Contents

1. Introduction

Provide background information about the research problem and its significance.

1.1 Research Context

The research explores the scalability and performance of neural architectures across classical, neuromorphic, and quantum models.

1.1.1 Research Questions

What are the comparative advantages and limitations of classical, neuromorphic, and quantum models in terms of performance and scalability?

2. Problem Statement

Clearly define the research problem and its scope. Use mathematical models if necessary. For example:

$$\min_{x} \|Ax - b\|_2^2$$

where A represents the input data matrix and b is the output vector.

3. Objectives

List the specific objectives of the research:

- Objective 1: Analyze classical neural networks.
- Objective 2: Evaluate neuromorphic systems.
- Objective 3: Explore quantum neural architectures.

4. Rationale of the Study

Explain the significance of the research and its potential contributions to the field.

5. Preliminary Literature Review

Summarize existing literature related to the topic and identify knowledge gaps.

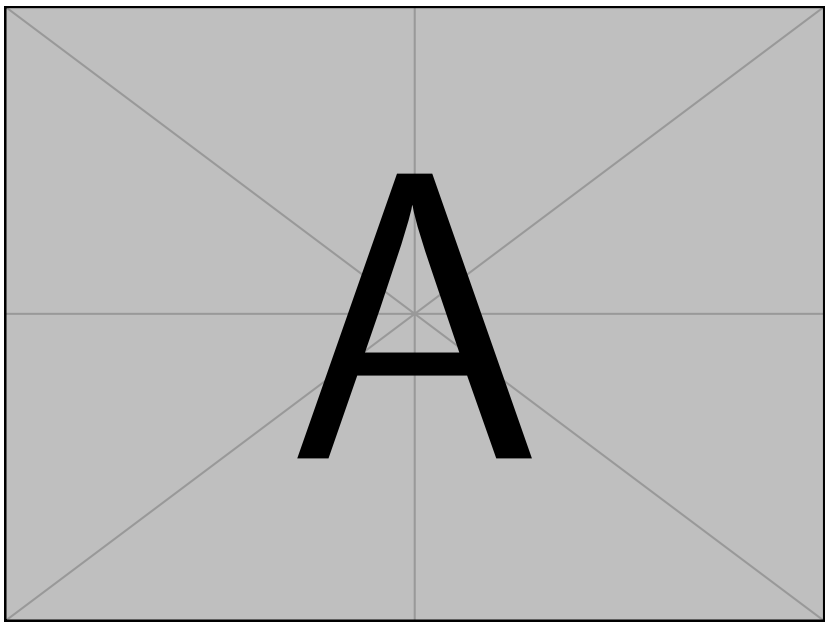

Figure 5.1: Trends in Neural Network Research

6. Methodology

Describe the research methods and tools. Include any relevant equations or algorithms.

6.1 Mathematical Representation

For example, the gradient descent algorithm is given by:

$$x_{k+1} = x_k - \alpha \nabla f(x_k) \tag{6.1}$$

7. Expected Outcomes

Outline the anticipated results of the research. For example, Table 7.1 summarizes the key outcomes.

Table 7.1: Expected Outcomes

Outcome	Description
Improved Accuracy	Better performance of neural networks.
Scalability Insights	Insights into hardware-software interactions.

8. Working Schedule

Provide a timeline for completing the research. For example:

Table 8.1: Proposed Work Schedule

Task	Timeline
Literature Review	Month 1-2
Data Collection	Month 3-5
Analysis	Month 6-7
Documentation	Month 8-9

References