Some Title

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Abstract

TBD

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Acknowledgements go here.

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Introduction

1.1 Motivation

1.2 Problem Statement

1.3 idk

Chapter 2

Background

2.1 Fundamental Concepts

On the macroscopic scale, objects and events are largely expected to have a defined state. [examples], and classical bit exists in either a `0` or `1` state. In general, however, there is a limit to the amount of information that can be gathered with certainty, as dictated by the Heisenberg uncertainty principle, see (2.1).

$$\sigma_x \sigma_p \geq \frac{\hbar}{2}, \tag{2.1}$$

where σ_x and σ_p represent the standard deviation in position and momentum, respectively, and $\hbar$ is the reduced Planck constant. In other words, there must always exist some uncertainty in knowing a particle's position and/or momentum, although it is small enough such that it typically only manifests at quantum scales.

Thus, in order to leverage classical physics, quantum states are generalized in terms of probabilistic wavefunctions, representing the weighted complex probability amplitudes spanning the entire state space of a quantum object. As the name implies, wavefunctions behave like waves, which can be interpreted as [...].

What is a Hilbert space - "a vector space equipped with an inner product that defines a distance function for which the space is a complete metric space."

The Dirac or "bra-ket" notation...

Chapter 3

Methods

Representation of Filter (as a data encoding problem) $|\psi\rangle\langle\psi|$

Convolutional Layers

Pooling Layers

Fully-connected Layer

Chapter 4

Results and Analysis

Chapter 5

Conclusion

References