Deep Learning on SpiNNaker

Master Thesis

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In the course of studies
High Performance Computing with Data Science

For the degree of
Master of Science

The University of Edinburgh

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Edinburgh, August 2020

Declaration

I declare that this dissertation was composed by myself, that the work contained herein is my own except where explicitly stated otherwise in the text, and that this work has not been submitted for any other degree or professional qualification except as specified.

Jonas Fassbender
August 2020

Abstract

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1. Introduction

Deep learning is revolutionizing the world. It has become part of our daily lives as consumers, powering major software products—from recommendation systems over translation tools to web search (LeCun et al., 2015). Major breakthroughs in fields like computer vision or natural language processing were achieved through the use of deep learning (Krizhevsky et al., 2012; Hinton et al., 2012). It has emerged as a driving force behind discoveries in numerous domains like particle physics, drug discovery, genomics or gaming (Ciodaro et al., 2012; Ma et al., 2015; Leung et al., 2014; Silver et al., 2016).

Deep learning has become so ubiquitous that we are changing the way we build modern hardware to account for its computational demands. From the way edge devices like mobile phones or embedded systems are designed over modern CPUs to specialized hardware for deep learning models (**?**). Whole supercomputers are build solely for deep learning (**?**).

Another field besides deep learning has high computational demands for specific algorithms: neuroscience.

2. Background

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References

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