Towards the Robust Image Recognition Using Spiking Neurons

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Abstract—

I. Introduction

Appendix A
Thesis Outline

The following section-level outline gives the planned thesis structure for this project. Sections which are reliant on upcoming work are indicated with a star (*);

1) Introduction
2) Background
   a) Neural Network on Image Recognition
   b) Neuron Models and Spiking Neural Network
   c) Spiking Neural Network Simulation
   d) Neuromorphic Simulators
3) Related Works
   a) Vision Databases and Benchmarks
   b) Deep Neural Networks
   c) Spike-Based Image Recognition
   d) Real-Time Neuromorphic Vision System
4) Benchmarking Spike-Based Visual Recognition
   a) Database
   b) Evaluation Methodology
5) Spiking Deep Belief Network
   a) Restricted Boltzmann Machine
   b) Deep Belief Network
   c) Spiking RBM and DBN *
6) Benchmarks
   a) ConvNet without Learning
   b) STDP Learned 2-Layer Network
   c) Spiking DBN *
7) Discussions *
   a) Benefits of Spikes
   b) Scalability of H/W SDBN
   c) Formalisation of SDBN
8) Future Work *
   a) SDBN Toolbox on SpiNNaker
   b) Learning on Spiking ConvNet
   c) Video-Based Recognition and Benchmarks

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