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Chapter 1

Introduction

Very brief background Deep learning good for large data set. Motivation is to work with less training examples

Existing work on meta learning and continuous learning

Gap the literature

Describe the Problem A system that can do continual learning. Refer to this doc: https://paper.dropbox.com/doc/Adding-classes-an-existing-classifier-RdKxXHh7M9OWbHvEvCCsV We want it to be scalable with respect to the number of classes So it should work faster than nearest neighbour based approaches for large number of classes

High level how you will solve it and why it is different from existing work

Brief description of experimental setup

Chapter 2

Background

2.1 Hand Engineered vs Learnt Features

2.2 Supervised learning

2.3 Optimization

s

2.3.1 SGD

2.3.2 Backprop

2.3.3 Auto optimizers like ADAM and RMSProp

2.4 Dealing with Small Training Data Sets

2.4.1 Overfitting

2.4.2 Transfer Learning

2.4.3 Few-Shot Learning

2.4.4 Meta Learning

Break into meta training, testing, episodes, etc.

2.5 Continuous Learning

Catastrophic forgetting

2.6 Modern Deep Learning Architectures

2.6.1 Convolutional Neural Networks

2.6.2 Recurrent Neural Networks

Chapter 3

Related Works

3.1 Meta Learning

Approaches in meta learning with neural networks are generally groupd into three categories.

3.1.1 Model Based

3.1.2 Metric Based

3.1.3 Optimization Based

3.2 Continuous Learning

Chapter 4

Proposal