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Classifying N-body simulations with and without relativistic corrections
using machine learning techniques

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-sometitle-

Classifying N-body simulations with and without
relativistic corrections using machine learning
techniques

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Abstract

Here come 3–6 sentences describing your thesis.

Sammendrag

Here comes the abstract in a different language.

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Preface

Here comes your preface, including acknowledgments and thanks.

Chapter 1

Introduction

This is the introduction

1.1 Motivation

1.2 Outline

1.3 Aim

1.4 Nomenclature

Part I

Cosmological Structure Formation

Chapter 2

Background Cosmology

2.1 Describing the Universe

2.2 The Friedmann Equations

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Chapter 3

Perturbation Theory

3.1 Initial Conditions

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Chapter 4

Simulations

4.1 N-body simulations

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Part II

Machine Learning

Chapter 5

Neural Networks

5.1 Forward pass - Prediction

5.1.1 Activation functions

5.1.2 Loss functions

5.2 Backpropagation - Training

5.2.1 Gradient descent

5.2.2 Optimizers

5.2.3 Regularization

TODO: Add dropout, batch normalization, weight decay, early stopping, data augmentation, etc. [2016JCAP...07..053A]

Chapter 6

Convolutional Neural Networks

6.1 Convolution

6.2 New Layers

6.2.1 Convolutional layers

6.2.2 Pooling layers

6.2.3 Dropout layers

