

POLITECNICO DI TORINO

DEPARTMENT OF CONTROL AND COMPUTER ENGINEERING

Master of Science in Computer Engineering

Master Degree Thesis

Deep Learning on Polito Knowledge Graph

Leveraging Relational GCN for link prediction between nodes of
a newly built publications graph



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To Monia

To my Grandfather

Abstract

Summary here, one page

Acknowledgements

Acknowledgements here, half page

Contents

List of Tables	8
List of Figures	9
1 Introduction	11
1.1 Motivation	11
1.2 Thesis structure	12
1.2.1 Chapter 2	12
1.2.2 Chapter 3	12
1.2.3 Chapter 4	12
2 Background	13
2.1 a section	13
2.1.1 a subsection	13
3 State of the art	15
4 Approach and Methodology	17
5 Development and Implementation	19
6 Evaluation	21
7 Conclusions	23
Bibliography	25

List of Tables

List of Figures

Chapter 1

Introduction

1.1 Motivation

Graphs are used to empower some of the most complex IT services available today. They can be used to represent almost any kind of information, and they are particularly capable of representing the structure of complex system, thus to express the relations between its elements.

In the past ten years, a lot of effort has been put into trying to leverage the power of graphs to represent human knowledge and to build search tools capable of query and understand the semantic relations inside such graphs. RDF graphs are a particular class of graphs that can be used to build knowledge repositories. Given a domain and an ontology, they allows to build a structured representaion of the knowledge of such domain.

Modern machine learning techniques can be used to mine latent informations from such graphs. One of the main challenges in this field is how to learn meaningful representations of the graph nodes that embed the underlying knowledge. Such representations can be then used to evaluate new links inside the graph, task commonly known as link prediction, or to classify unseen nodes. Deep learning techniques have proved to be first class citizens when dealing with representation learning tasks, being able to learn the latent representation of nodes without any prior knowledge other than the graph structure, so as not to require any feature engineering.

1.2 Thesis structure

1.2.1 Chapter 2

1.2.2 Chapter 3

1.2.3 Chapter 4

Chapter 2

Background

2.1 a section

2.1.1 a subsection

Chapter 3

State of the art

Chapter 4

Approach and Methodology

Chapter 5

Development and Implementation

Chapter 6

Evaluation

Chapter 7

Conclusions

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