ETH
Eidgenössische Technische Hochschule Zürich
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Applying the GAN Framework to Recommender Systems

Master Thesis

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Abstract

This example thesis briefly shows the main features of our thesis style, and how to use it for your purposes.

Contents

Chapter 1

Introduction

- Introduce Problem statement
- Describe the goal of the thesis
- Clear question to be answered during the thesis

Chapter 2

Background

2.1 Recommendation Systems

2.1.1 Problem Statement

2.1.2 Variants

2.1.3 Well-Known Systems

- Specify the Problem of Recommendation as a scoring problem on items
- Describe possile bases for recommendation (User Based, Item Based, Session Based)
- Describe most popular existing solutions (Collaborative Filtering, Wide and Deep Learning)

2.2 Concepts/Models/...

2.2.1 Recurrent Neural Networks

2.2.2 Generative Adversarial Network Framework

2.2.3 Hierarchical RNNs for personalized Recommendations

[2]

2.2.4 Professor Forcing

[1]

2.2.5 Meta-Prod2Vec

[3]

- Describe RNNs
- Describe Hiearchical RNNs
- Describe the GAN Framework
- Describe Professor Forcing as an application of the GAN Framework to RNNs
- Describe Meta-Prod2Vec as an embedding framework and where we would use it inside our model

2.3 KPIs

2.3.1 Click-Through-Rate

2.3.2 Conversion Rate

- Describe different KPIs
- What do they meaure, how to optimize for it

Chapter 3

Dataset

3.1 Data Collection

3.1.1 Data Generation Mechanism

3.1.2 Data Storage

- Describe how the system produces the data
- Describe how the data is stored

3.2 Data Extraction

- Describe how the data is extracted
- Describe what is done to clean the data
-

Chapter 4

System Overview

4.1 Model Architecture

- Describe Model Architecture
- Describe different Components of Model Architecture
- Describe different variants of the model (with/without pf, with/without embeddings)

4.2 Implementation

- Describe Class Diagram
- Describe Code Structure
- Describe Deployment
- Describe prediction mode/training mode

Chapter 5

Experiments

For each of the model variants evaluate the experiments offline and online.

5.1 Offline

5.1.1 Experiment Setup

5.1.2 Measurements

5.2 Online/Production Experiment Setup

5.2.1 Experiment Setup

5.2.2 Measurements

Chapter 6

Results

- bring everything together
- compare best performing model to automl from google

Appendix A

Dummy Appendix

You can defer lengthy calculations that would otherwise only interrupt the flow of your thesis to an appendix.

Bibliography

[1] Alex Lamb, Anirudh Goyal, Ying Zhang, Saizheng Zhang, Aaron Courville, and Yoshua Bengio. Professor forcing: A new algorithm for training recurrent networks. http://arxiv.org/abs/1610.09038, 2016.

[2] Massimo Quadrana, Alexandros Karatzoglou, Balázs Hidasi, and Paolo Cremonesi. Personalizing session-based recommendations with hierarchical recurrent neural networks. http://arxiv.org/abs/1706.04148, 2017.

[3] Flavian Vasile, Elena Smirnova, and Alexis Conneau. Meta-prod2vec - product embeddings using side-information for recommendation. http://arxiv.org/abs/1607.07326, 2016.

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