Research on High School Math Exercise Recommendation Based on Graph Neural Network

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Overview

1. Introduction
   - Research Background
   - Existing Problems
   - Research Cores
2. Proposed Model
   - Exercise Knowledge Labelling
3. Result

Background

- Knowledge State Monitoring
- Learning Resource Recommendation
- High School Math

Problems

Disorganized exercise Exercises lacking knowledge tags

Knowledge evaluation Description of second item

Exercise recommendation Description of third item

Research Cores

Exercise knowledge labelling

A multi-knowledge point labeling algorithm for high school mathematics exercises based on bidirectional LSTM (Bi-LSTM) [1] and graph convolutional neural network (GCN) [3].

Knowledge tracing

A knowledge tracing model based on Transformer [5] architecture with graph attention network embedding.

Exercise recommendation

A mathematical exercise recommendation model based on Matching-Ranking [4] algorithm.

Exercise Knowledge Labelling

Architecture

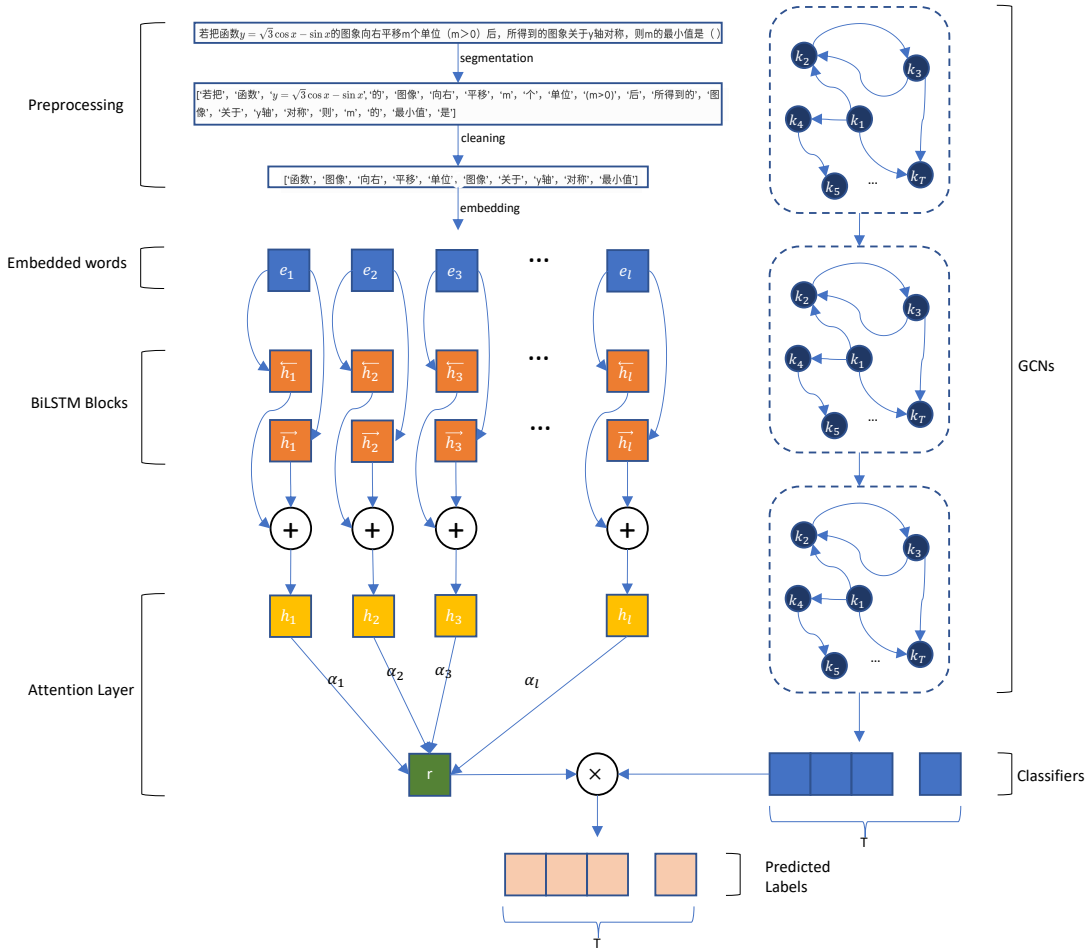

Figure: Model architecture

Exercise Knowledge Labelling

Details

Modules

1. BERT [2] Embedding Layer
2. Attentional Bi-LSTM Text Representation
3. GCN-based Classifier

Knowledge Tracing

Exercise Recommendation

Block 1

content

Block 2

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Block 3

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Table

Table: Table caption

Treatments	**Response 1**	**Response 2**
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Theorem

Theorem (Mass-energy equivalence)

$E = mc^2$

Figure

Uncomment the code on this slide to include your own image from the same directory as the template .TeX file.

References I


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