

Exercise recommender system based on knowledge graph and knowledge modeling

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Overview

Background

The educational method of teaching students in accordance with their aptitude has a history of more than 2,000 years in our country, but in the context of our country's exam-oriented education, it is really easy to say that it is difficult to formulate a personalized learning plan based on students' different cognitive levels, learning abilities and their own qualities. When traditional thinking is combined with cutting-edge technology, the feasibility of teaching students in accordance with their aptitude has been greatly improved. After the intervention of AI, there are two ways to achieve personalized learning.

Basic Methodology

- ▶ Analyze content and build a knowledge graph.
- ▶ Adaptive learning to realize intelligent recommendation.

Knowledge graph[?]



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Figure: KG research fields

KG Completion

Alberto et. al utilized recurrent neural networks to learn time-aware representations of relation types which can be used in conjunction with existing latent factorization methods.[?]

Yao et. al introduced the work of knowledge base completion. Combined with the pre-training model BERT, it can integrate richer context representation into the model, and achieve SOTA effects in tasks such as triple classification, link prediction, and relationship prediction.[?]

Cognitive Diagnosis

Wang et. all proposed neural cognitive diagnosis method for intelligent education system. [?]

Knowledge Tracing

- ▶ Individualized Bayesian Knowledge Tracing Models[?]
- ▶ Deep Knowledge Tracing[?]
- ▶ Tracking Knowledge Proficiency of Students with Educational Priors[?]

[?]

References I



Ji, S., Pan, S., Cambria, E., Marttinen, P., & Yu, P. S. (2020).
A survey on knowledge graphs: Representation, acquisition and applications.
arXiv preprint arXiv:2002.00388.



Liang Yao and Chengsheng Mao and Yuan Luo. (2019).
KG-BERT: BERT for Knowledge Graph Completion.
arXiv preprint arXiv:1909.03193.



Wang F, Liu Q, Chen E, et al.
Neural Cognitive Diagnosis for Intelligent Education Systems[J].
arXiv preprint arXiv:1908.08733, 2019.



Yudelson M V, Koedinger K R, Gordon G J.
Individualized bayesian knowledge tracing models[C]
International conference on artificial intelligence in education. Springer,
Berlin, Heidelberg, 2013: 171-180.

References II



Piech C, Bassen J, Huang J, et al.

Deep knowledge tracing.

In Advances in neural information processing systems (pp. 505-513).



Chen Y, Liu Q, Huang Z, et al.

Tracking knowledge proficiency of students with educational priors[C]

Proceedings of the 2017 ACM on Conference on Information and Knowledge Management. 2017: 989-998.

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