PRICAI 2023 notification for paper 363

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发件人: PRICAI 2023<pricai2023@easychair.org>

收件人: Zhiliang Tian<tianzhiliang@nudt.edu.cn>

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Dear Zhiliang Tian,

Congratulations! It's our great pleasure to inform you that your submission

ID: 363
Title: Prompting GPT-3.5 for Text-to-SQL with De-semanticization and Skeleton Retrieval

has been *conditionally* accepted for publication as a *regular* paper in proceedings of the 20th Pacific Rim International Conference on Artificial Intelligence (PRICAI-2023) to be held In Jakarta, Indonesia between November 17 - 19, 2023.

You are required to address *all* the concerns and issues (especially the presentation) that were raised by the reviewers to the satisfaction of the Program chairs. Please submit a separate document that outlines the changes you make together with your revised paper.

We received an overwhelming number of submissions this year, a total of 422 submissions: 354 for the Main track and 68 for the AI Impact track. Submissions in both tracks were evaluated with the same highest quality standard. Eventually, we accepted 104 regular papers and 39 short papers for oral presentation.

Each paper received at least 3 reviews and, in some cases, up to 6. During the review process, discussions among the PC members in charge were carried out before decisions could be made, and when necessary, additional reviews were sourced. Finally, PRICAI-2023 PC chairs read the reviews and comments and made a final calibration for differences among individual reviewer scores in light of the overall decisions. The entire organisation (program committee members, external reviewers, and chairs) expended tremendous effort to be as fair and careful as possible.

We urge you to seriously consider the reviews and suggestions in preparing your final manuscript. Please make sure that you check your paper for plagiarism / similarity. We require that the plagiarism / similarity score to be less than *15%*.

The deadline of camera-ready copy (CRC) is due on

Tuesday, August 22, 2023, 23:59 (anywhere on earth)

Prompting GPT-3.5 for Text-to-SQL with De-semanticization and Skeleton Retrieval

Chunxi Guo, Zhiliang Tian (✉), Jintao Tang (✉), Pancheng Wang, Zhihua Wen, Kang Yang and Ting Wang (✉)

College of Computer, National University of Defense Technology, Changsha, China
{chunxi, tianzhiliang, tangjintao, wangpancheng13, zhwen, yangkang, tingwang}@nudt.edu.cn

Abstract. Text-to-SQL is a task that converts a natural language question into a structured query language (SQL) to retrieve information from a database. Large language models (LLMs) work well in natural language generation tasks, but they are not specifically pre-trained to understand the syntax and semantics of SQL commands. In this paper, we propose an LLM-based framework for Text-to-SQL which retrieves helpful demonstration examples to prompt LLMs. However, questions with different database schemes can vary widely, even if the intentions behind them are similar and the corresponding SQL queries exhibit similarities. Consequently, it becomes crucial to identify the appropriate SQL demonstrations that align with our requirements. We design a de-semanticization mechanism that extracts question skeletons, allowing us to retrieve similar examples based on their structural similarity. We also model the relationships between question tokens and database schema items (i.e., tables and columns) to filter out scheme-related information. Our framework adapts the range of the database schema in prompts to balance length and valuable information. A fallback mechanism allows for a more detailed schema to be provided if the generated SQL query fails. Ours outperforms state-of-the-art models and demonstrates strong generalization ability on three cross-domain Text-to-SQL benchmarks.

Keywords: Large language model, Text-to-SQL, Prompt learning

1 Introduction

Text-to-SQL tasks aim to transform natural language questions (NLQ) into structured query language (SQL), enabling users without expertise in database querying to retrieve information from a database [1,2]. Considering that databases are used in various scenarios involving different domains (e.g., education, financial systems), researchers have adapted encoder-decoder architecture [3,4], which eliminates the need for domain-specific knowledge through end-to-end training. To train the model, these approaches require diverse and extensive training data, which can be prohibitively expensive [5].

Large pre-trained language models (LLMs) (e.g., GPT-3 [6] and Codex [7]) encompass more extensive data and parameters than traditional pre-trained language models (e.g., BERT [8], RoBERTa [9], BART [10] and T5 [11]) and exhibit