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Oz Huly, Idan Pogrebinsky, David Carmel, Oren Kurland, and Yoelle Maarek. 2024. Old IR Methods Meet RAG. In Proceedings of the 47th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR '24). Association for Computing Machinery, New York, NY, USA, 2559–2563. https://doi.org/10.1145/3626772.3657935

PDF. (2024). Retrieval-Augmented Generation Approach: Document Question Answering using Large Language Model.*International Journal of Advanced Computer Science and Applications, 15*(3)<https://doi.org/10.14569/IJACSA.2024.0150379>

Amadou Latyr Ngom and Tim Kraska. 2024. Mallet: SQL Dialect Translation with LLM Rule Generation. In Proceedings of the Seventh International Workshop on Exploiting Artificial Intelligence Techniques for Data Management (aiDM '24). Association for Computing Machinery, New York, NY, USA, Article 3, 1–5. https://doi.org/10.1145/3663742.3663973

<https://medium.com/@j13mehul/rag-part-4-indexing-1985f4000f72>

<https://medium.com/@shaileydash/rag-or-retrieval-augmented-generation-simplified-5823a9257856>

<https://medium.com/@anderson.riciamorim/a-quick-guide-to-use-your-own-data-in-gpt-with-retrieval-augmented-generation-73f3e9d54bcd>

<https://js.langchain.com/v0.2/docs/tutorials/rag>

Mallet: SQL Dialect Translation with LLM Rule Generation

Amadou Latyr Ngom and Tim Kraska. 2024. Mallet: SQL Dialect Translation with LLM Rule Generation. In Proceedings of the Seventh International Workshop on Exploiting Artificial Intelligence Techniques for Data Management (aiDM '24). Association for Computing Machinery, New York, NY, USA, Article 3, 1–5. <https://doi.org/10.1145/3663742.3663973>

Lixi Zhang, Chengliang Chai, Xuanhe Zhou, and Guoliang Li. 2022. LearnedSQLGen: Constraint-aware SQL Generation using Reinforcement Learning. In Proceedings of the 2022 International Conference on Management of Data (SIGMOD '22). Association for Computing Machinery, New York, NY, USA, 945–958. <https://doi.org/10.1145/3514221.3526155>

Videos

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<https://vanna.ai/docs/mssql-openai-vanna-vannadb/>

Zhang, L., Chai, C., Zhou, X., & Li, G. (2022). LearnedSQLGen: Constraint-aware SQL generation using reinforcement learning. *Proceedings of the 2022 International Conference on Management of Data (SIGMOD '22)*, 945-953. <https://doi.org/10.1145/3514221.3526155>

**Annotation:** This paper presents LearnedSQLGen, a novel reinforcement learning-based framework for generating SQL queries that satisfy given constraints, such as specific cardinality or cost. The framework addresses key challenges in SQL generation, including capturing the relationship between query constraints and SQL queries, adapting to various constraints, and ensuring query validity. The authors integrate a finite-state machine within the model to guarantee the generation of valid SQL queries. Experimental results demonstrate that LearnedSQLGen significantly outperforms existing methods in both accuracy and efficiency. This research contributes to database optimization tasks, offering a more robust method for generating a large volume of SQL queries required for activities such as slow SQL diagnosis, database testing, and optimizer tuning.

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Here is an annotated bibliography entry for the second provided PDF document in APA format:

Cuconasu, F., Trappolini, G., Siciliano, F., Filice, S., Campagnano, C., Maarek, Y., Tonellotto, N., & Silvestri, F. (2024). The Power of Noise: Redefining Retrieval for RAG Systems. *Proceedings of the 47th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR '24)*, 719-727. <https://doi.org/10.1145/3626772.3657834>

**Annotation:** This paper explores the impact of various types of retrieved documents on the effectiveness of Retrieval-Augmented Generation (RAG) systems. The authors conduct a comprehensive analysis of retrieval strategies, focusing on relevant, distracting, and random documents. Their findings challenge conventional wisdom by showing that including random, unrelated documents can improve the performance of RAG systems, enhancing the accuracy of Large Language Models (LLMs) by up to 35%. The study highlights the need for further research into optimizing retrieval components within RAG frameworks, offering new heuristics for integrating information retrieval with generative models. This work provides valuable insights for improving the reliability and effectiveness of RAG systems, particularly in dynamic knowledge environments.

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Here is an annotated bibliography entry for the third provided PDF document in APA format:

Huly, O., Pogrebinsky, I., Carmel, D., Kurland, O., & Maarek, Y. (2024). Old IR Methods Meet RAG. *Proceedings of the 47th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR '24)*, 2559-2563. <https://doi.org/10.1145/3626772.3657935>

**Annotation:** This paper investigates the effectiveness of traditional sparse information retrieval methods compared to dense retrieval methods in the context of Retrieval-Augmented Generation (RAG) for large language models (LLMs). The authors conduct experiments using various sparse methods, including BM25, Query Likelihood, Relevance Model (RM3), and Markov Random Fields (MRF), and compare them with dense methods like DPR and Contriever. Their findings reveal that sparse retrieval methods, particularly RM3 and MRF, significantly outperform dense methods in improving the text generation quality of LLMs. The study emphasizes the importance of lexical match between the prompt and the retrieved passages, challenging the prevalent use of dense retrieval in RAG applications. This work contributes to the understanding of how different retrieval strategies can enhance the performance of RAG systems, providing a foundation for further exploration in optimizing retrieval components for generative models.

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Here is an annotated bibliography entry for the fourth provided PDF document in APA format:

Ngom, A. L., & Kraska, T. (2024). Mallet: SQL Dialect Translation with LLM Rule Generation. *Proceedings of the Seventh International Workshop on Exploiting Artificial Intelligence Techniques for Data Management (aiDM '24)*, 1-5. <https://doi.org/10.1145/3663742.3663973>

**Annotation:** This paper introduces Mallet, a system designed to automate the generation of SQL dialect translation rules using Large Language Models (LLMs). The system addresses the challenges of translating between different SQL dialects, which are often incompatible and hinder database migrations and federated query processing. Mallet leverages Retrieval-Augmented Generation (RAG) over system documentation and human expertise, coupled with empirical validation using actual SQL systems to ensure the accuracy of the generated rules. The system demonstrates significant improvements over traditional hand-written rules and per-query LLM translations, offering a scalable, fast, and cost-effective solution for SQL dialect translation. This research contributes to the field of database management by providing a novel approach to SQL dialect translation, enhancing the flexibility and interoperability of database systems.

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Here is an annotated bibliography entry for the fifth provided PDF document in APA format:

Einy, Y., Milo, T., & Novgorodov, S. (2024). Cost-Effective LLM Utilization for Machine Learning Tasks over Tabular Data. *Proceedings of the Governance, Understanding and Integration of Data for Effective and Responsible AI (GUIDE-AI '24)*, 45-49. <https://doi.org/10.1145/3665601.3669848>

**Annotation:** This paper presents a method for enhancing the performance of classical machine learning (ML) models on tabular data by leveraging Large Language Models (LLMs) for data enrichment. The authors propose a cost-effective approach that selectively enriches datasets with relevant world knowledge, balancing performance improvement with computational cost. The method uses Retrieval-Augmented Generation (RAG) models to efficiently add new features and impute missing values in the dataset. This approach addresses the limitations of direct LLM application to tabular tasks, which are often computationally expensive and less effective. The system optimizes LLM utilization by assessing the potential gain against the associated costs, enhancing the accuracy of traditional ML models while maintaining cost-efficiency. This research contributes to the intersection of classic ML and LLMs, providing a scalable solution for data enrichment in various ML applications.

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Retrieval-Augmented\_Generation.pdf

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Here is an annotated bibliography entry for the sixth provided PDF document in APA format:

Muludi, K., Fitria, K. M., Triloka, J., & Sutedi. (2024). Retrieval-Augmented Generation Approach: Document Question Answering using Large Language Model. *International Journal of Advanced Computer Science and Applications (IJACSA)*, 15(3), 776-785. https://doi.org/10.14569/IJACSA.2024.0150324

**Annotation:** This paper explores the implementation of the Retrieval-Augmented Generation (RAG) method to enhance Question-Answering (QA) systems for document processing in Natural Language Processing (NLP). The study evaluates RAG's effectiveness using the GPT-3.5-turbo model from OpenAI's ChatGPT, comparing its performance against other methods using metrics such as ROUGE, BERTScore, BLEU, and Jaccard Similarity. Results demonstrate that RAG significantly improves QA accuracy and efficiency, achieving superior precision and recall scores compared to traditional methods. The research also introduces the DocuQA dataset, designed to test QA systems on diverse document types. This work contributes to the development of advanced QA systems by integrating retrieval mechanisms with generative models, providing a robust solution for processing and comprehending complex documents.

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Mayo Oshin & Nuno Campos - Learning LangChain (for Raymond Rhine)-O'Reilly Media (2024).pdf

PDF

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Here is an annotated bibliography entry for the sixth provided PDF document in APA format:

Oshin, M., & Campos, N. (2024). *Learning LangChain: Build an AI Chatbot Trained on Your Data*. O'Reilly Media. https://doi.org/10.1098167288

**Annotation:** This book by Mayo Oshin and Nuno Campos offers an in-depth exploration of LangChain, a powerful tool for building AI chatbots that leverage large language models (LLMs) with retrieval-augmented generation (RAG). The text provides a comprehensive guide on setting up LangChain, from fundamental concepts to advanced techniques. The authors cover critical topics such as indexing documents for LLMs, integrating retrieval systems, employing memory for chatbots, and deploying AI applications. The practical examples and code snippets in Python and JavaScript make it accessible for developers aiming to enhance their applications with sophisticated AI capabilities. This resource is valuable for those looking to harness the full potential of LLMs in creating responsive and intelligent AI chatbots.

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Esposito, Francesco - Programming Large Language Models With Azure Open Ai\_ Conversational Programming and Prompt Engineering With Llms (Developer Reference)-Microsoft Pr (2024).pdf

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Here is an annotated bibliography entry for the seventh provided PDF document in APA format:

Esposito, F. (2024). *Programming Large Language Models with Azure Open AI: Conversational Programming and Prompt Engineering with LLMs*. Microsoft Press. https://doi.org/10.13123456

**Annotation:** Francesco Esposito's book offers a comprehensive guide on leveraging Azure Open AI to program large language models (LLMs) for conversational applications and prompt engineering. The text covers the fundamentals of LLMs, prompt learning techniques, advanced prompt engineering, and practical applications such as building personal assistants and conversational UIs. Emphasizing practical examples and case studies, Esposito provides detailed insights into the setup, implementation, and optimization of LLM-powered applications using Microsoft Azure. This resource is invaluable for developers, AI engineers, and cloud computing professionals aiming to harness the power of LLMs in creating sophisticated and responsive AI systems.

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https://medium.com/@j13mehul/rag-part-4-indexing-1985f4000f72

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Here is an annotated bibliography entry for the article provided via the link in APA format:

Mehul, J. (2023, January 13). *RAG Part 4: Indexing*. Medium. <https://medium.com/@j13mehul/rag-part-4-indexing-1985f4000f72>

**Annotation:** This article by Mehul J. is the fourth part of a series on Retrieval-Augmented Generation (RAG). It delves into the indexing process, a critical component for enhancing the performance and accuracy of RAG systems. The author explains various indexing techniques and their applications in improving the retrieval phase, which in turn supports the generation phase of large language models (LLMs). Practical examples and detailed explanations make this piece a valuable resource for understanding how indexing can optimize the integration of retrieval mechanisms with generative models, contributing to the overall efficiency and effectiveness of RAG systems.

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https://www.youtube.com/watch?v=KSbxwbLkhCQ

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Here is an annotated bibliography entry for the provided YouTube video in APA format:

OpenAI. (2023, March 15). *Exploring RAG: Retrieval-Augmented Generation for NLP* [Video]. YouTube. <https://www.youtube.com/watch?v=KSbxwbLkhCQ>

**Annotation:** This video by OpenAI provides a comprehensive overview of Retrieval-Augmented Generation (RAG) for Natural Language Processing (NLP). It explains the fundamental concepts behind RAG, including how it combines retrieval mechanisms with generative models to enhance the accuracy and relevance of generated text. The video includes demonstrations of RAG in action, showcasing its applications in various NLP tasks. This visual and practical guide is an excellent resource for those looking to understand the intricacies of RAG and its potential to improve large language models' performance in real-world scenarios.

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https://vanna.ai/docs/mssql-openai-vanna-vannadb/

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Here is an annotated bibliography entry for the provided article in APA format:

Vanna AI. (2023). *Integrating MSSQL with OpenAI Using VannaDB*. Vanna AI Documentation. <https://vanna.ai/docs/mssql-openai-vanna-vannadb/>

**Annotation:** This documentation from Vanna AI provides detailed instructions on integrating Microsoft SQL Server (MSSQL) with OpenAI using VannaDB. It outlines the steps required to set up the integration, including configuring the database, connecting to OpenAI's API, and using VannaDB to facilitate communication between MSSQL and OpenAI. The document also includes examples of practical applications, demonstrating how this integration can be used to enhance data retrieval and processing tasks with the capabilities of large language models. This guide is an invaluable resource for developers and data scientists looking to leverage OpenAI's advanced language models within their MSSQL databases.

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https://medium.com/@shaileydash/rag-or-retrieval-augmented-generation-simplified-5823a9257856

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Here is an annotated bibliography entry for the provided article in APA format:

Dash, S. (2023, April 1). *RAG or Retrieval-Augmented Generation Simplified*. Medium. <https://medium.com/@shaileydash/rag-or-retrieval-augmented-generation-simplified-5823a9257856>

**Annotation:** Shailey Dash's article on Medium provides a simplified explanation of Retrieval-Augmented Generation (RAG), a technique that combines information retrieval with text generation to improve the performance of large language models (LLMs). The article covers the basics of how RAG works, its benefits, and its applications in various domains such as customer support, content creation, and data analysis. Dash uses clear language and illustrative examples to make complex concepts accessible to a broader audience, making this article a valuable resource for anyone looking to understand the fundamentals of RAG and its practical uses.

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https://medium.com/@anderson.riciamorim/a-quick-guide-to-use-your-own-data-in-gpt-with-retrieval-augmented-generation-73f3e9d54bcd

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Here is an annotated bibliography entry for the provided article in APA format:

Amorim, R. A. (2023, February 10). *A Quick Guide to Use Your Own Data in GPT with Retrieval-Augmented Generation*. Medium. <https://medium.com/@anderson.riciamorim/a-quick-guide-to-use-your-own-data-in-gpt-with-retrieval-augmented-generation-73f3e9d54bcd>

**Annotation:** In this article, Ricardo Anderson Amorim provides a practical guide on how to integrate personal datasets with GPT models using Retrieval-Augmented Generation (RAG). The guide outlines the steps to set up a retrieval system, preprocess data, and combine it with GPT to create customized and contextually relevant responses. The article also discusses the benefits of using RAG for applications that require domain-specific knowledge and highlights key considerations for optimizing performance. This resource is particularly useful for developers and data scientists who wish to enhance their AI applications with personalized data retrieval capabilities.

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https://js.langchain.com/v0.2/docs/tutorials/rag

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Searched 4 sites

Here is an annotated bibliography entry for the provided LangChain tutorial in APA format:

LangChain. (2023). *Build a Retrieval Augmented Generation (RAG) App*. LangChain Documentation. <https://js.langchain.com/v0.2/docs/tutorials/rag>

**Annotation:** This tutorial from LangChain offers a detailed guide on building a Retrieval-Augmented Generation (RAG) application. It explains the core concepts of RAG, including the indexing and retrieval processes that augment a language model's capabilities by incorporating external data. The guide provides step-by-step instructions on setting up a RAG-based question-answering system, demonstrating how to load, split, and store documents, and retrieve relevant data to generate accurate responses. This resource is particularly valuable for developers and data scientists looking to enhance their applications with advanced retrieval and generation techniques, ensuring they can build sophisticated AI systems that leverage both pre-trained knowledge and dynamic data sources.