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CENTRUM FÜR INFORMATIONS- UND SPRACHVERARBEITUNG
STUDIENGANG COMPUTERLINGUISTIK

Thesis proposal

Topic: **Survey on the Application of Agent Tools Using LLMs**

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Examiner: Hinrich Schütze

Level: BAc, MSc

Summary: LLMs into agent tools has opened new avenues for intelligent automation and interaction. Agents powered by LLMs, such as virtual assistants, chatbots, and autonomous systems, are transforming industries by automating complex tasks, facilitating communication, and providing real-time solutions. Despite their promise, the application of agent tools with LLMs presents several challenges, such as ensuring reliable performance, avoiding biases, and managing complex interactions. This proposal aims to conduct a comprehensive survey on the current state of agent tools leveraging LLMs, their applications across industries, the challenges faced, and the future prospects of these technologies.

- Key Areas of Application.

- Types of Agent Tools.

- Challenges in LLM-powered Agent Tools.

- Future Trends and Prospects

Requirements: good programming skills, ability to large scale language models.

References:

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- Guoxin Chen et al. (2024). *Learning Evolving Tools for Large Language Models*. arXiv: 2410.06617 [cs.CL]. URL: https://arxiv.org/abs/2410.06617

- Shaokun Zhang et al. (2024). *Offline Training of Language Model Agents with Functions as Learnable Weights*. arXiv: 2402.11359 [cs.AI]. URL: https://arxiv.org/abs/2402.11359

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- Lifan Yuan et al. (2024). *CRAFT: Customizing LLMs by Creating and Retrieving from Specialized Toolsets*. arXiv: 2309.17428 [cs.CL]. URL: https://arxiv.org/abs/2309.17428

- Cheng Qian et al. (Dec. 2023). "CREATOR: Tool Creation for Disentangling Abstract and Concrete Reasoning of Large Language Models". In: *Findings of the Association for Computational Linguistics: EMNLP 2023*. Ed. by Houda Bouamor, Juan Pino, and Kalika Bali. Singapore: Association for Computational Linguistics, pp. 6922–6939. DOI: 10.18653/v1/2023.findings-emnlp.462. URL: https://aclanthology.org/2023.findings-emnlp.462