

# Talking to Databases

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## Introduction

Industrial data access often relies on predefined reports and dashboards, limiting flexible exploration and creating a gap between technically available and practically accessible data. This thesis evaluates a Text-to-SQL approach that translates natural language questions into executable SQL queries. Although Text-to-SQL technology has advanced rapidly, its real-world impact and successful implementation in production environments remain uncertain [1–3].

## Methods

The thesis follows a *mixed-methods field study* in the industrial environment of Saarstahl. More than 20 users including engineers, stakeholders and other users of varying backgrounds with different levels of technical and SQL experience are participating. The study combines subjective assessments with technical and behavioral evidence [4].

## Expected Outcomes and Contribution

The thesis will provide an empirical evaluation of Text-to-SQL in a real steel-industry environment. It will determine whether LLM-based Text-to-SQL approaches are production-ready and improve access to industrial data while maintaining sufficient accuracy, usability, and appropriate user trust [5,6].

- Practical evaluation: Comparison with the existing data-access process based on task completion time, correctness, SQL validity, query complexity, and specialist verification.
- Human-centered perspective: Evidence concerning usability, cognitive effort, transparency, trust, and the perceived risk of hidden errors.



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### Research Interests:

Computer Vision, Machine Learning, Generative AI



## References

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- 4 Creswell, J. W., et al. (2018). *Designing and Conducting Mixed Methods Research*
- 5 Lee, J. D., et al. (2004). Trust in automation: Designing for appropriate reliance. *Human Factors*
- 6 International Organization for Standardization. (2018). *Ergonomics of Human-System Interaction, Part 11: Usability: Definitions and Concepts.*