Project Flow Diagram

Domain Knowledge

Technical Part

Create Synthetic Data

- -Test different prompt strategies to generate **Semantic Misalignment Errors**
- -Extract technical specifications from Bosch user manuals to create **Specialized Errors data**
- -Use **Azure OpenAI** to generate synthetic user reviews containing semantic and specialized errors to ensure data diversity
- -Design prompt variations to simulate different types of errors found in realworld reviews

Build Knowledge Graph

- -Construct a **Neo4J knowledge graph** using Bosch technical data, including product names, synonyms, and valid numeric ranges
- -Develop a **technical knowledge** base (dictionary, database, or graph) to standardize terminology and product specifications
- -Use **Neo4J** to structure product nodes, attributes, and technical relationships, ensuring accurate error validation
- -Implement query mechanisms to allow **LLM** to **retrieve relevant specifications f**or validation

Use LLM for Error Detection

- -LLM detects Semantic
 Misalignment & Specialized Errors in
 user reviews to ensure consistency
 with technical standards
- -The **Knowledge Graph** provides technical specifications and error criteria for accurate error detection
- **-LLM analyzes user reviews** to identify potential semantic and specialized errors
- **-LLM extracts technical details** (e.g., temperature, voltage, torque) and cross-checks them against the Knowledge Graph
- -If discrepancies are found, **errors are flagged**, and **violation explanations** are generated

Parse, Validate, and Generate Output

- -Ensure **consistent product naming**, numeric **validation**, **and compliance** with Bosch technical standards
- -Prevent misinterpretations of user reviews that could impact **product evaluation and decision-making**
- -Parse LLM-generated JSON output, structure results into a database, and generate a CSV report
- -Automate CSV output, including Error Flags (Yes/No) and Explanations