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Traffic News Generation, Large Language Models (LLM), RTV Slovenija, Prompt Engineering

In the domain of LLMs and fact-enhanced generation,

FACTGEN introduces a hybrid approach that integrates external knowledge retrieval with LLM-driven text generation. This model applies fact-enrichment techniques to ensure that generated news remains factually consistent and contextually rich. FACTGEN's methodology aligns closely with LLM fine-tuning for domain-specific traffic news, where additional datasets can improve accuracy and relevance. [4]

Recent advancements in NLP-driven traffic reporting have explored the integration of social media mining with fine-tuned LLMs to enhance real-time traffic alerts. One such approach employs a BERT model to classify and extract relevant traffic incident details from social media posts. By leveraging question-answering techniques, this system identifies key attributes such as location, time, and severity, transforming them into structured alerts for navigation assistants. This method highlights the potential of LLM-based prompt engineering to improve the responsiveness and accuracy of automated traffic reporting. [5]

In the field of AI-generated radio news, recent research has tested ChatGPT's ability to produce concise, broadcast-ready news reports. By iteratively refining prompts, researchers assessed the model's adherence to journalistic standards such as clarity, brevity, and objectivity. While the AI successfully adapted to structured news writing, it faced challenges with grammatical nuances, numerical expressions, and language-specific syntax. This study underscores the role of prompt engineering in optimizing LLM outputs for domain-specific news automation, particularly in multilingual contexts such as Slovenian and Slovak traffic reports. [6]

Collectively, these studies demonstrate the evolving role of NLP, LLM fine-tuning, and prompt engineering in automated traffic news generation. They highlight the importance of structured data processing, real-time adaptation, and factual accuracy, key considerations for deploying LLM-based Slovenian traffic news automation.

Methods

The project involves two key datasets: Podatki - Prometno-Porocilo_2022_2023_2024.xlsx, which contains structured traffic data, and Podatki - rtvslo.si, which includes archived traffic news manually written by students. Additionally, we have an instructional document, PROMET.docx, which outlines the formatting and structuring of traffic reports. Since the raw Excel data consists of various columns such as event categories, timestamps, operator details, and HTML-formatted text fields, preprocessing is necessary to ensure the data is usable. This preprocessing involves extracting relevant traffic event types (e.g., accidents, roadworks, congestion, weather conditions, and obstacles), cleaning and parsing HTML text fields, standardizing road names and directions based on PROMET.docx, and filtering out redundant or irrelevant entries. These steps are essential for improving the accuracy and consistency of the generated traffic reports.

As additional input we will experiment how additional external data such as weather may improve our output. We

will use open source data from the Slovenian government that are on OPSI (such as weather information from ARSO or the past data about roadworks and car accidents). In our initial approach, we will focus on prompt engineering to generate traffic news on Llama 3.1 LLM. Llama is a free open-source LLM that does not officially support Slovene, but it can still generate decent-quality Slovenian text, making it a good option for our project. Alternatively we will use DeepSeek, another open-source LLM that supports Slovene language. We will experiment with different prompt techniques such as instruction tuned, self-consistency, prompt chaining, structuring the prompt with tags, adopting a persona, etc. ensuring generated text adheres to RTV Slovenija's guidelines from the instructional document.

Evaluation

To evaluate the generated traffic reports, we will compare the model generated reports with human-written reports from Podatki - rtvslo.si to assess accuracy and relevance. This will involve tokenization of reference and generated text so that we can evaluate it with precision, recall, and F1-score to measure the identification of key traffic events. We could also use BLEU that measures how closely the reference and generated text match by evaluating the overlap of words and phrases. Or use ROUGE scores that assess textual similarity with reference reports. The system can also be evaluated based on its ability to correctly identify and prioritize important events, ensuring that high-priority incidents such as wrong-way drivers, road closures, and severe congestion are emphasized. To achieve this, we will create a priority weight system based on the hierarchy of events from PROMET.docx. Lastly we can conduct human evaluation to rate reports based on clarity, correctness, and informativeness.

will be incorporated by having RTV Slovenija staff rate reports based on clarity, correctness, and informativeness, along with conducting A/B testing to compare generated and human-written news for quality assessment.

The evaluation process will also verify road naming accuracy using a rule-based check against the formatting standards defined in PROMET.docx. Furthermore, we will use a semantic similarity approach to ensure that the generated reports extract only the most relevant data from Podatki - Prometno-Porocilo_2022_2023_2024.xlsx while filtering out unnecessary information. Text length, readability, and conciseness will also be measured to ensure compliance with RTV Slovenija's broadcast requirements. Finally, human evaluation will be incorporated by having RTV Slovenija staff rate reports based on clarity, correctness, and informativeness, along with conducting A/B testing to compare generated and human-written news for quality assessment.

Results

TODO

Discussion

TODO

Acknowledgments

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References

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