
Master Thesis

Natural Language Generation
and Dialogue Systems

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Constraint Decoding For Natural Language Generation in Dialogue Systems

DESCRIPTION:

Tools like ChatGPT and Bard promise to help with many everyday tasks. At the core of these tools are Large Language Models that show an impressive ability to generate well-formulated and highly suitable text. However, one of the problems of these models are hallucinations – the generation of incorrect information but presented as facts – leading to questions about their reliability. This is also a problem for the language generation from structured data as is found in dialogue systems.

Some techniques to alleviate the generation of hallucinations aim at curating training data or augmenting the in-context learning with additional information. However, there is still no control on the output of the language model.

The goal of this thesis is to investigate methods of constraining the decoding and sampling process of large language models to given constraints. The use-case for development and evaluation is the generation of language from dialogue acts – formal definitions of what a system says.

The thesis comprises the following items:

1. Literature review of state-of-the-art techniques to constrain the decoding/sampling within large language models.
2. Selection of a set of techniques and application of these to the use-case of generating language from dialogue acts based on a publicly available data set.
3. Evaluation of the proposed techniques.

PREREQUISITES:

- Solid programming skills
- Profound interest in machine learning and text processing

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