Philipps Universität Marburg

Controllable Generation Using kNN Language Models

Master/Bachelor Thesis

Motivation

Language modeling forms the foundation of many language processing problems and involves predicting which words come next in a sequence. Recent work on kNN language models has shown improved perplexity by storing encodings of sentence contexts and retrieving similar contexts to alter the probability distribution when predicting the next token (Khandelwal et al. 2020). If we store not only the encoding, but also labeled stylistic attributes of a sentence (e.g. politeness, formality, toxicity), can we use this to control generated language to contain these attributes to higher or lower degrees while preserving fluency? How can these stored attributes and encodings be leveraged most effectively?

Difficulty

Analysis

Programming

Literature

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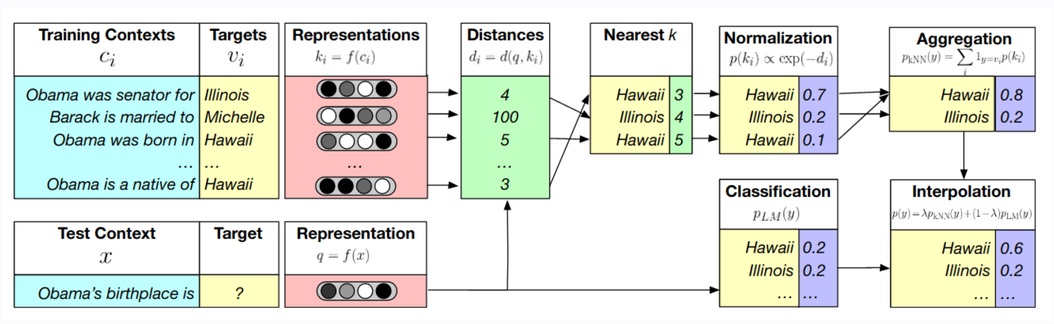
Task Description

We can use datasets on formality, politeness, offensive language, toxicity prompts, or others we find interesting to explore. We hope to show improved generation control while maintaining fluency with automatic and human evaluations. One potential foreseeable difficulty or subproblem is memory usage for stored encodings. This can be mitigated by only storing encodings of sentences with relevant attributes and could be an interesting direction for further exploration. Work can be submitted for publication upon completion.



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