UNLEMMATIZATION

RECOVERING WORD FORMS IN MORPHOLOGICALLY RICH LANGUAGES

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INTRODUCTION

Given a lemmatized sentence, it is possible for a human to suggest word forms so that the sentence starts making sense.

дарио оставлять жена в панама и предпринимать путешествие в столица аргентина

- *дарио оставил жену в панаме и предпринял путешествие в столицу аргентины*
- *дарио оставляет жён в панаме и предпринимает путешествие в столицу аргентины*

This “decoding task” of suggesting a set of word forms so that the sentence would become grammatical (and ultimately meaningful) could be modeled using recent developments in machine learning.

INTRODUCTION

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(2) generating only one possible answer that humans would not complain about.

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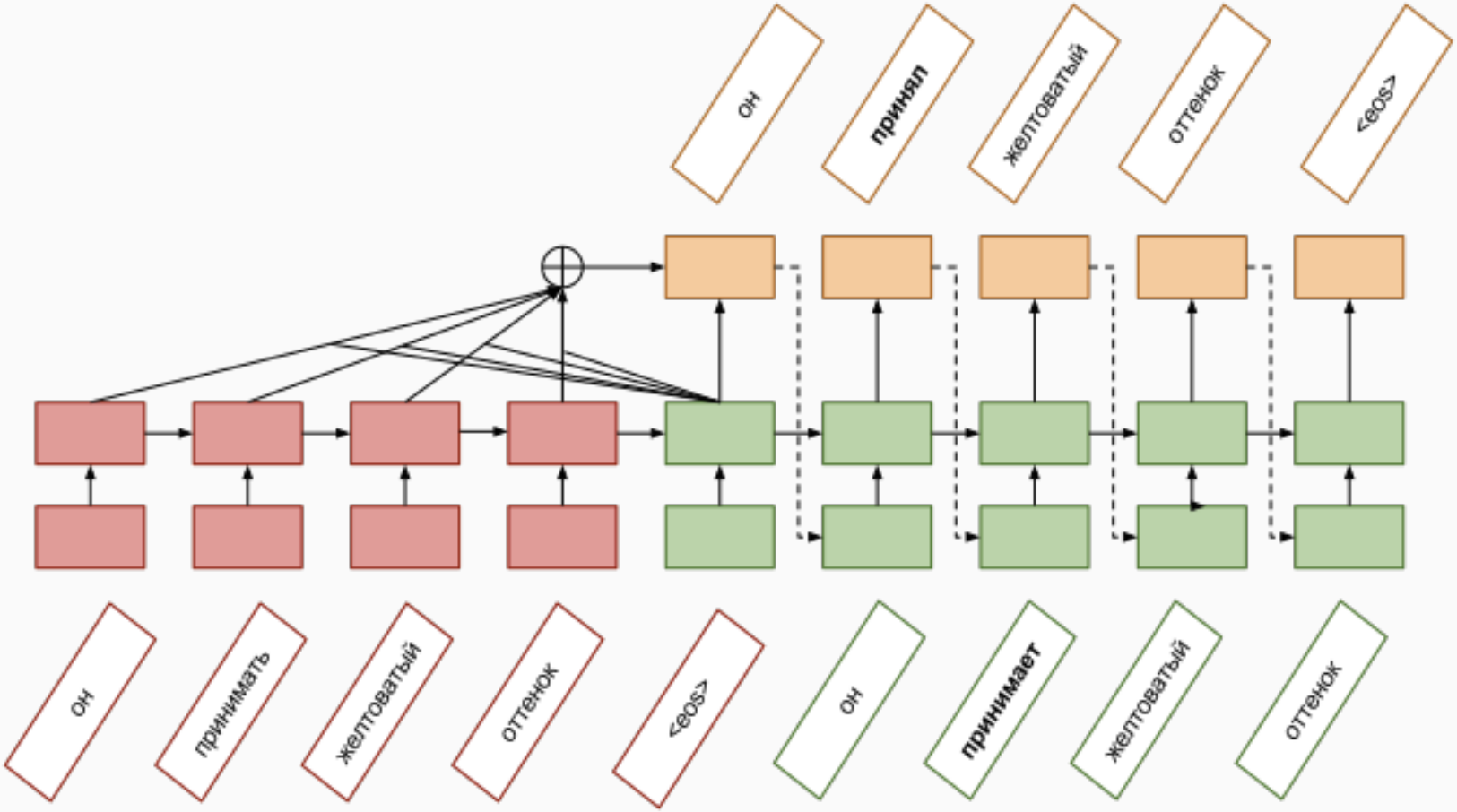
POSSIBLE APPLICATIONS

- In native advertising
- NLP systems output postprocessing
- Data augmentation in statistical NLP
- More ideas?

FIRST APPROACH: OPEN-NMT + RU-WIKIPEDIA



CHERRY-PICKED RESULTS

	text
lemmatized	в тот же год занимать пост министр внутренний дело
true answer	в том же году занимает пост министра внутренних дел
wiki-10k	в том же году занял принял франции письмо государства
wiki-100k	в том же году занял пост министра внутренних дел
lemmatized	после обработка он принимать зеленоватый оттенок
true answer	после обработки он принимает зеленоватый оттенок
wiki-10k	после завершения он принял хозяйство львовуголь
wiki-100k	после обработки он принял зеленоватый оттенок

CHALLENGES

BLEU expects matching word by word, however, different word forms sometimes should not be treated as an error

Possible solutions — proxies from other NLP models

“grammaticality” could be estimated using the probabilities of generated sentences computed

(1) by some gold standard language model,
(2) by a probabilistic POS-tagging model.
(3) more ideas?

FUTURE WORK DIRECTIONS

- Apply statistical machine translation methods
- Do a thorough analysis of errors and find their possible causes
- Apply character-level machine translation models
- Apply SOTA MT models, e.g. *Attention is All You Need*
- Construct a **large training corpus** based on Russian fiction texts or user-generated texts from social networks
- Sequence learning methods with grammatical information as a hidden state

Thank you for your attention!

Questions?

Welcome to our poster stand