Recent Advances In Document-level Neural Machine Translation

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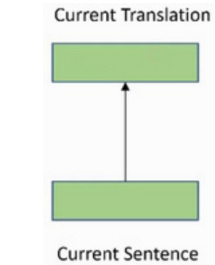
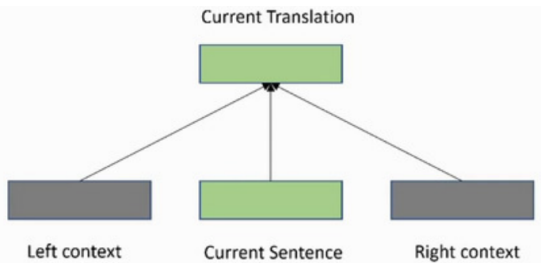
What is Document-level Machine Translation

Sentence-level MT

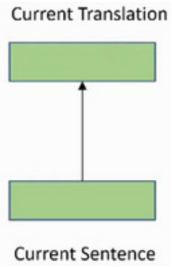


Document-level MT

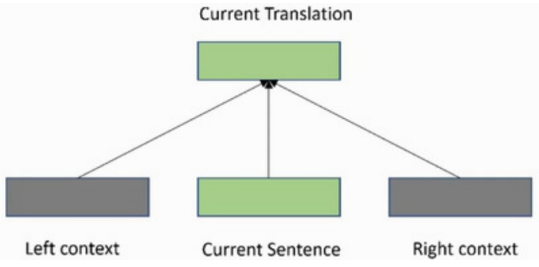


Document-level MT ↔ Context-aware MT

Context-agnostic MT



Context-aware MT



Why Document-level NMT ?

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- Some recent results suggest that neural machine translation (NMT) "approaches the accuracy achieved by average bilingual human translators [on some test sets] [Wu et al., 2016]
- "In a pairwise ranking experiment, human raters assessing **adequacy** and **fluency** show a stronger preference for human over machine translation when evaluating documents as compared to isolated sentences." [Lubli et al., 2018]

Sentence-level NMT is inconsistent

B: How are you today?

Sentence-level NMT is inconsistent

B: How are you today?

SENTENCE-LEVEL TRANSLATION

B: Comment vas-tu aujourd'hui ?

Sentence-level NMT is inconsistent

A: Good Morning, Mr. President.

B: How are you today?

SENTENCE-LEVEL TRANSLATION

B: Comment vas-tu aujourd'hui ?

Sentence-level NMT is inconsistent

A: Good Morning, Mr. President.

B: How are you today?

SENTENCE-LEVEL TRANSLATION

B: Comment vas-tu aujourd'hui ?

CONTEXT-AWARE TRANSLATION

B: Comment allez-vous aujourd'hui ?

How frequent are inconsistencies ?

[Voita et al., 2019] undertake a human study on context agnostic translation :

- 2000 pairs of consecutive English sentences (S1 + S2) from OpenSubtitles2018
- translate to Russian with Transformer model [Vaswani et al., 2017]

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all	one/both bad	both good	
		bad pair	good pair
2000	211	140	1649
100%	11%	7%	82%

Which kind of inconsistencies?

type of phenomena	frequency
deixis	37%
ellipsis	29%
lexical cohesion	14%
ambiguity	9%
anaphora	6%
other	5%

Figure: Types of phenomena causing inconsistencies between English-Russian context-agnostic translations of consecutive sentences when placed in the context of each other.

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- **Evaluate such models** in a proper way;

Plan

Thank you for your attention!

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