Automatic Detection of Linguistic Quality Violations

Jonathan Oberländer

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Universität des Saarlandes
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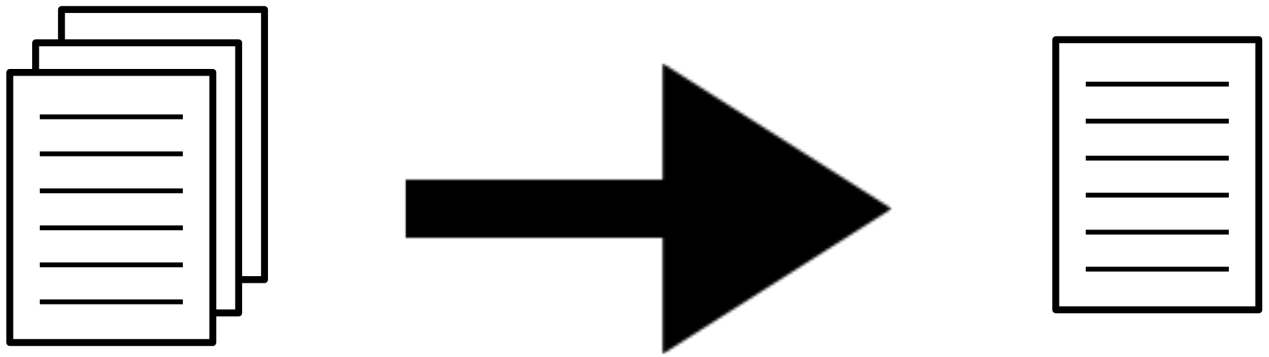
Automatic Summarization



Automatic Summarization

- **Single-Document:** One document
- **Multi-Document:** Multiple documents on the same topic

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	Single-document	Multi-document
Abstractive		
Extractive		

Linguistic Quality Violations

Summarization systems should produce coherent and grammatical output.

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Summarization systems don't produce coherent and grammatical output.
Why?

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$\Rightarrow$ LQVCorpus (Friedrich et al., 2014)

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- Entity level:
  - FM-EXPL, SM+EXPL
  - DNP-REF, INP+REF
  - PRN-ANT, PRN+MISLA
  - ACR-EXPL

LQVCorpus (Friedrich et al., 2014)

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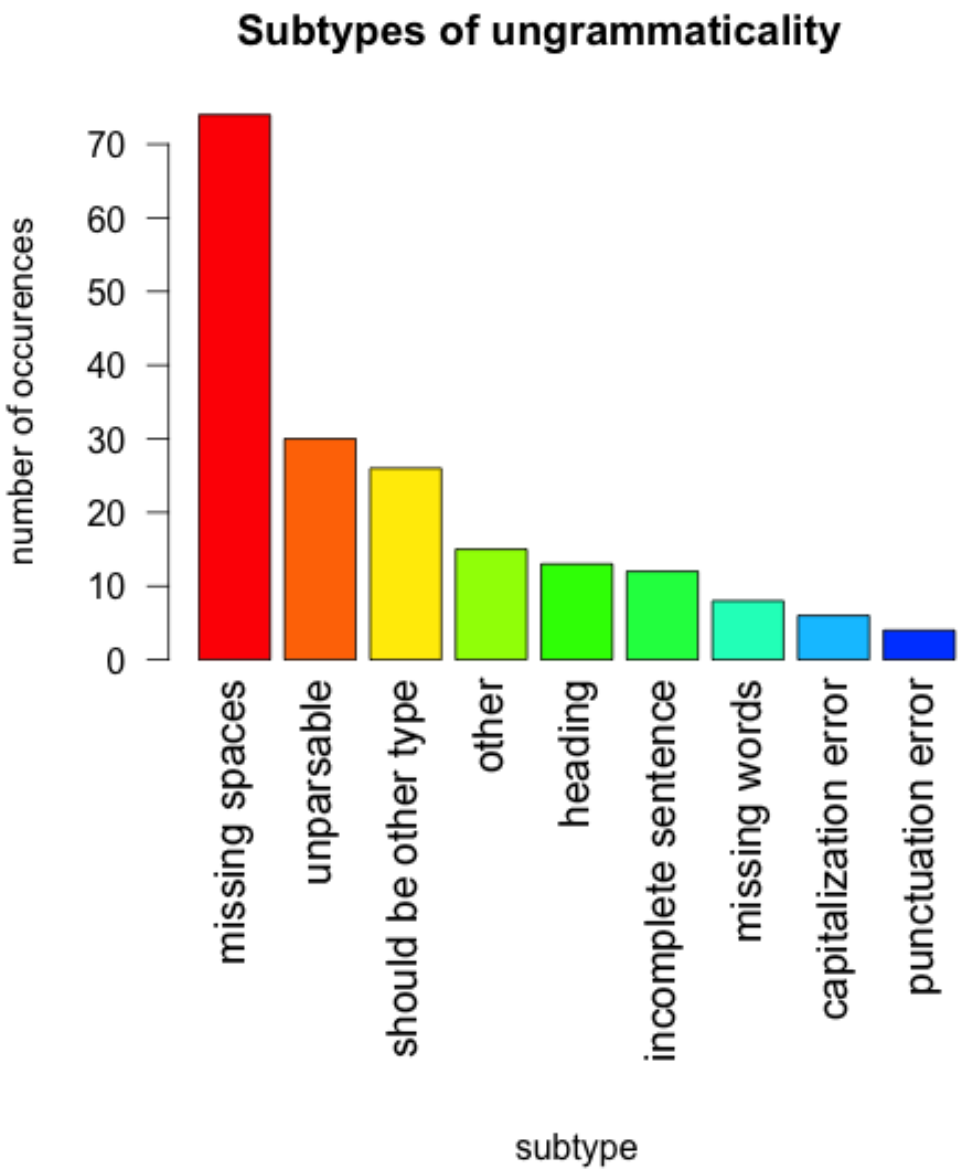
- Entity level:
  - FM-EXPL, SM+EXPL
  - DNP-REF, INP+REF
  - PRN-ANT, PRN+MISLA
  - ACR-EXPL
- Clause level:
  - **incomplete sentence (INCOMPLSN)**
  - **inclusion of datelines (INCLDATE)**
  - **other ungrammatical form (OTHRUNGR)**
  - no semantic relatedness (NOSEMREL)
  - **redundant information (REDUNINF)**
  - no discourse relation (NODISREL)

Ungrammaticality (OTHRUNGR+INCOMPLSN)



Detecting missing spaces

"A strong earthquake measuring 7.8 magnitude struck **Wenchuancounty** *of Sichuan Province on Monday, leaving at least* **12,000people** *died and thousands more injured."*

"Virginia Tech reported a campus shooting Monday and told **studentsto** *stay inside their residences and away from windows."*

"A gunman opened fire on classrooms at Virginia Tech University **onMonday** *morning, killing at least 30 people before turning his* **gunon** *himself in the bloodiest school shooting in US history."*

UnknownTokens

Idea:
Sentence contains violation iff any word $\notin$ known tokens

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Sentence contains violation iff any word $\notin$ known tokens

known tokens?

- Source documents available? $\rightarrow$ all tokens in source documents = $\textbf{UnknownTokens}_{\textbf{source}}$
- Otherwise $\rightarrow$ $\textbf{UnknownTokens}_{\textbf{general}}$

$\mathbf{UnknownTokens}_{\mathbf{general}}$

- Tokens from (parts of) Gigaword = $\mathbf{UnknownTokens}_{\mathbf{gw}}$

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- + Heuristics (Capitalized words) = $\textbf{UnknownTokens}_{\textbf{gw+heur}}$

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- Tokens from (parts of) Gigaword = $\textbf{UnknownTokens}_{\textbf{gw}}$
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- + Heuristics (Capitalized words) = $\textbf{UnknownTokens}_{\textbf{gw+heur}}$
- + NER (Finkel et al., 2005) = $\textbf{UnknownTokens}_{\textbf{gw+heur+ner}}$
- + Wikipedia = $\textbf{UnknownTokens}_{\textbf{gw+heur+ner+wiki}}$

UnknownTokens: Evaluation

	Missing spaces			No missing spaces		
	P	**R**	**F**	**P**	**R**	**F**
Baseline	0.0	0.0	0.0	94.8	**100**	97.3
UT_{gw}	15.0	**98.7**	26.0	**99.9**	69.1	81.7
$UT_{gw+heur}$	30.5	97.3	46.5	99.8	87.8	93.4
$UT_{gw+heur+ner}$	35.5	97.3	52.0	99.8	90.3	94.8
$UT_{gw+heur+ner+wiki}$	70.3	96.0	81.2	99.8	97.8	98.8
UT_{source}	**95.9**	94.6	**95.2**	99.7	99.7	**99.7**

RandomForest

foo bar

detecting ungrammaticality:evaluation

foo bar

detecting datelines

foo bar

detecting datelines:method

foo bar

detecting datelines:eval

foo bar

detecting redundancies

foo bar

detecting redundancies:method

foo bar

detecting redundancies:eval

foo bar

References

Finkel, J. R., Grenager, T., and Manning, C. (2005). Incorporating non-local information into information extraction systems by gibbs sampling. In *Proceedings of the 43rd Annual Meeting on Association for Computational Linguistics*, pages 363–370. Association for Computational Linguistics.

Friedrich, A., Valeeva, M., and Palmer, A. (2014). Lqvsumm: A corpus of linguistic quality violations in multi-document summarization.

Owczarzak, K. and Dang, H. T. (2011). Overview of the tac 2011 summarization track: Guided task and aesop task. In *Proceedings of the Text Analysis Conference (TAC 2011), Gaithersburg, Maryland, USA, November*.