An Awkward Disparity between BLEU / RIBES Scores and Human Judgements in Machine Translation

Liling Tan, Jon Dehdari[1] and Josef van Genabith[1]
Universität des Saarlandes
Deutsches Forschungszentrum für Künstliche Intelligenz (DFKI)[1]
liling.tan@uni-saarland.de, {first.last_name}@dfki.de

UNIVERSITÄT DES SAARLANDES

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Introduction

· MT metrics criticized for various reasons

(Babych and Hartley, 2004; Smith et al. 2014; Graham et al. 2015)

Hypothesis 1:
Appeared calm when he was taken to the American plane , which will to Miami , Florida.

Hypothesis 2:
which will he was , when taken Appeared calm to the American plane to Miami , Florida

Same BLEU?!

Reference:
Orejuela appeared calm as he was led to the American plane which will take him to Miami , Florida.

· Low BLEU != Bad MT (Callison-Burch et al. 2006)

· Higher BLEU -> Better MT (c.f. WMT, WAT, IWSLT, OpenMT)

BLEU: (Papineni et al. 2002)

· Precision based
· Weak recall penalty
· Disregards order
· Crude ngram weights
· Over-sensitive to minor difference

Source:
이러한작용을발휘하기위해서는, 각각 0.005% 이상함유하는것이바람직하다.

Hypothesis:
このような作用を発揮するためには、夫々０．００５％以上含有することが好ましい。

Baseline:
このような作用を発揮するためには、それぞれ０．００５％以上含有することが好ましい。

Reference:
このような作用を発揮させるためには、夫々０．００５％以上含有させることが好ましい。

Hypothesis	Baseline
P_1 : 90.0	P_1 : 84.2
P_2 : 78.9	P_2 : 66.7
P_3 : 66.7	P_3 : 47.1
P_4 : 52.9	P_4 : 25.0
BP: 0.905	**BP:** 0.854
BLEU: 64.03	**BLEU:** 43.29
HUMAN: -5	**HUMAN:** 0

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RIBES (Isozaki et al. 2014)

· Kendall Tau prior on unigram
· Overcomes reordering
· Adequacy not measured
· Correlates with BLEU (*naturally*)

Source:
T용융(DSC) = 89.9℃; T결정화(DSC) = 72℃(5℃/분에서DSC 로측정).

Hypothesis:
Ｔｍｅｌｔ（ＤＳＣ）＝７２℃（５℃／分でＤＳＣ測定（ＤＳＣ）＝89．９結晶化度（Ｔ）。

Baseline:
Ｔ溶融（ＤＳＣ）＝８９．９℃；Ｔ結晶化（ＤＳＣ）＝７２℃（５℃／分でＤＳＣで測定）。

Reference:
Ｔｍｅｌｔ（ＤＳＣ）＝８９．９℃；Ｔｃｒｙｓｔ（ＤＳＣ）＝７２℃（５℃／分でＤＳＣを用いて測定）。

Hypothesis
RIBES: 94.04
BLEU: 53.3
HUMAN: -5

Baseline
RIBES: 86.33
BLEU: 58.8
HUMAN: 0

System Setup + Results

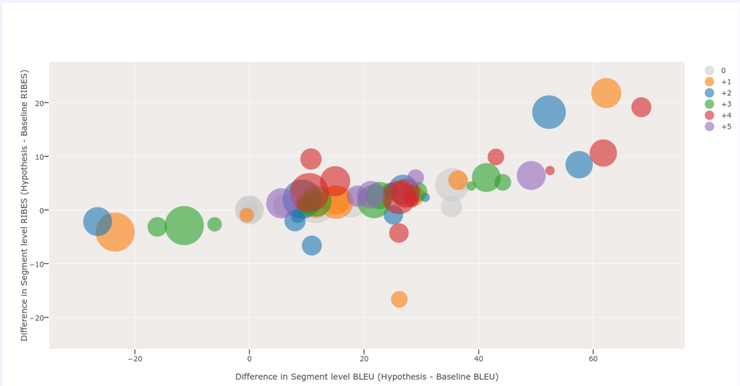
Parameters	Organizers	Ours
Input document length	40	80
Korean tokenizer	MeCab	KoNLPy
Japanese tokenizer	Juman	MeCab
LM *n*-gram order	5	5
Distortion limit	0	20
Quantized & binarized LM	no	yes
`devtest.txt` in LM	no	yes
Binarized phrase tables	no	yes
MERT runs	1	2

· **Organizers**:
RIBES = 94.13 ; BLEU = 69.22 ; HUMAN = 0.0

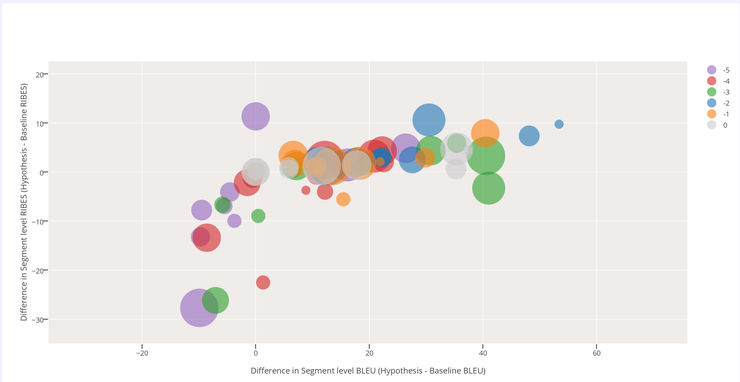
· **Ours** :
RIBES = 95.15 ; BLEU = **85.23** ; HUMAN = **-17.75 !!!**

Note: This is our `Unicode2String` submission for KO->JA patent subtask in WAT 2015; the other results of other subtasks are presented in Tan and Bond (2014) and Tan et al. (2015)

Meta-Evaluation



Bubble Graph of Diff. Hypothesis - Baseline BLEU against RIBES for ***Positive*** HUMAN Scores



Bubble Graph of Diff. Hypothesis - Baseline BLEU against RIBES for ***Negative*** HUMAN Scores

Conclusion

· Higher BLEU/RIBES correlates with *+ve* HUMAN, not *-ve* HUMAN
· Minor lexical diff. cause huge diff. in BLEU ; RIBES mostly measures fluency
· Minor metric score diff. not reflecting major translation inadequacy
· Higher BLEU != Better MT

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