Findings of the 2016 Conference on Machine Translation

WMT 2016 @ ACL
Berlin, Germany
August 11–12

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News Translation Task

Overview

~~Français~~

čeština
Deutsch
NEW română
рýсский
suomi
NEW Türkçe

English

Funding

- European Union's Horizon 2020 program

- Yandex (Russian–English and Turkish–English test sets)
- University of Helsinki (Finnish–English test set)

Participation

102 entries from 24 institutions

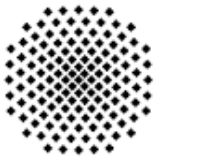
+4 anonymized commercial, online, and rule-based systems

















Universität Stuttgart

Aalto University

Carnegie Mellon University

Université de Montréal

PROMT TRANSLATOR

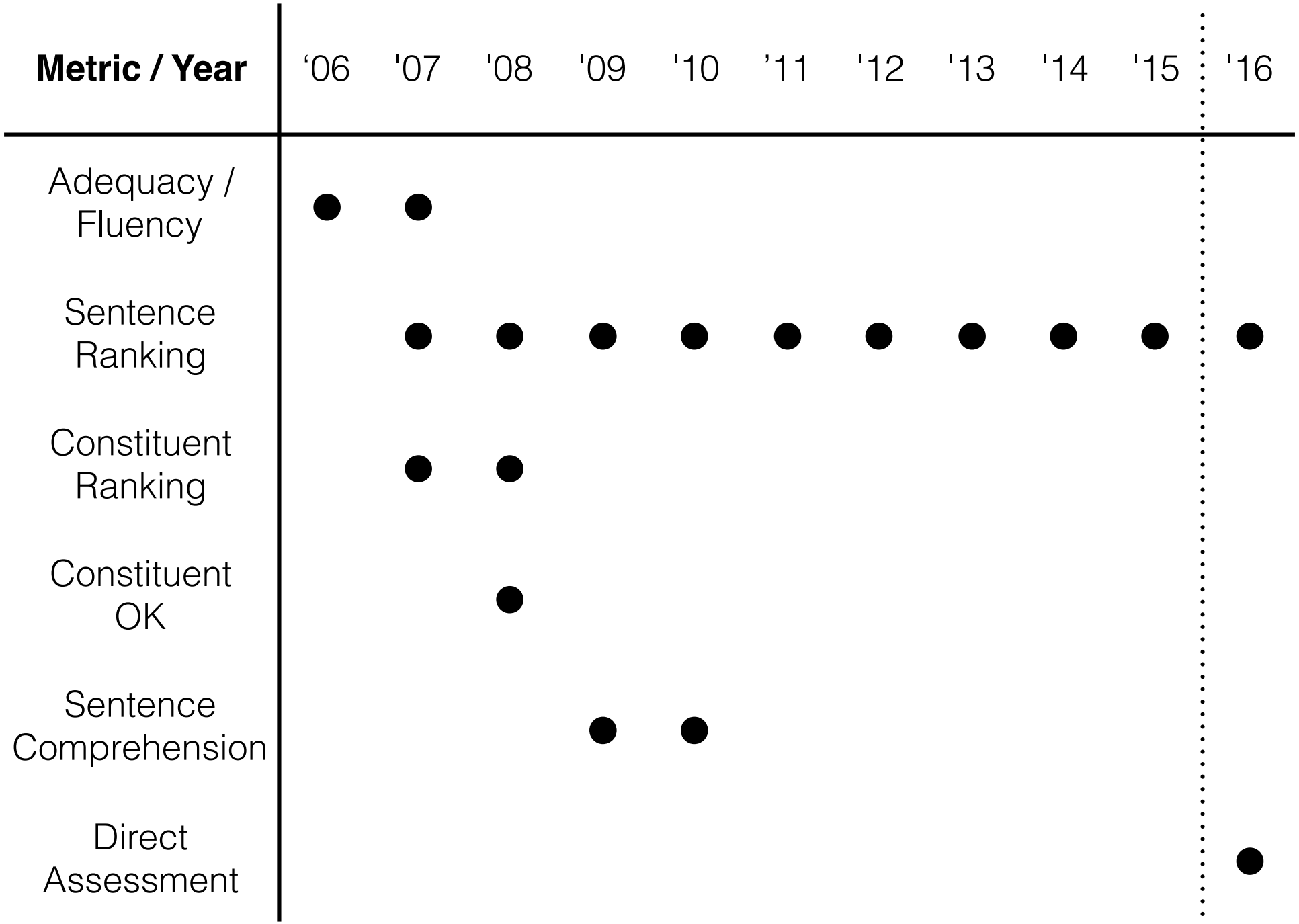
RWTH AACHEN UNIVERSITY

Deutsches Forschungszentrum für Künstliche Intelligenz GmbH

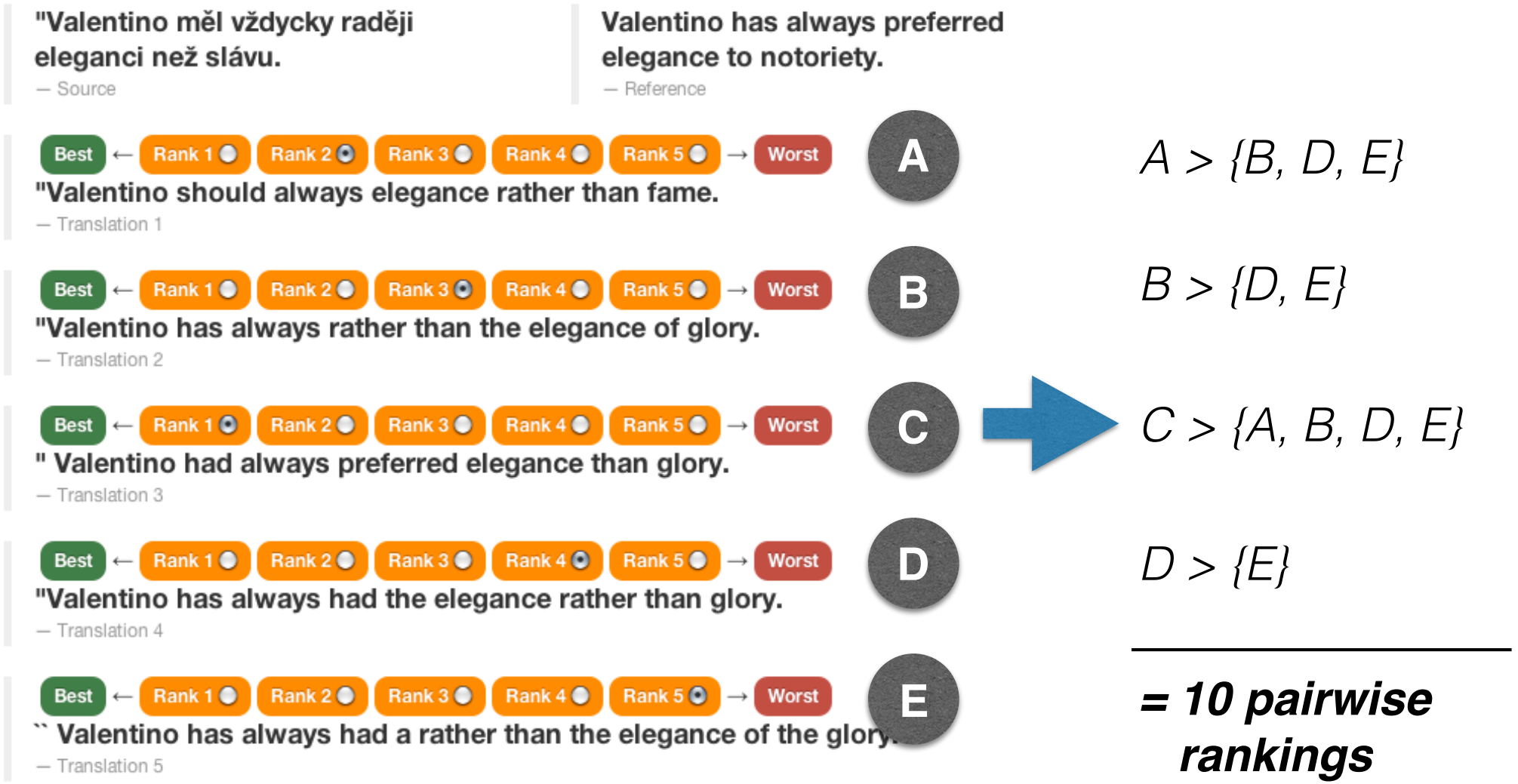
Human Evaluation

Human Evaluation

- We wish to identify the best systems for each task
  - Automatic metrics are useful for development, but must be grounded in **human evaluation** of system output
- How to compute it?
  - Adequacy / fluency, **sentence ranking (RR)**, constituent ranking, constituent OK, sentence comprehension
  - **Direct Assessment (DA)**


Metric / Year
‘06
'07
'08
'09
'10
’11
'12
'13
'14
'15
'16
Adequacy / Fluency
Sentence Ranking
Constituent Ranking
Constituent OK
Sentence Comprehension
Direct Assessment

Sentence Ranking

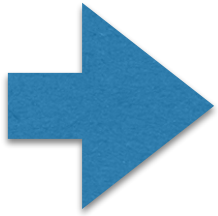


https://github.com/cfedermann/Appraise/

More Judgments

- Innovation: rank distinct outputs instead of systems

	1	2	3	4	5
F				•	
A				•	
B		•			
J					•
H			•		



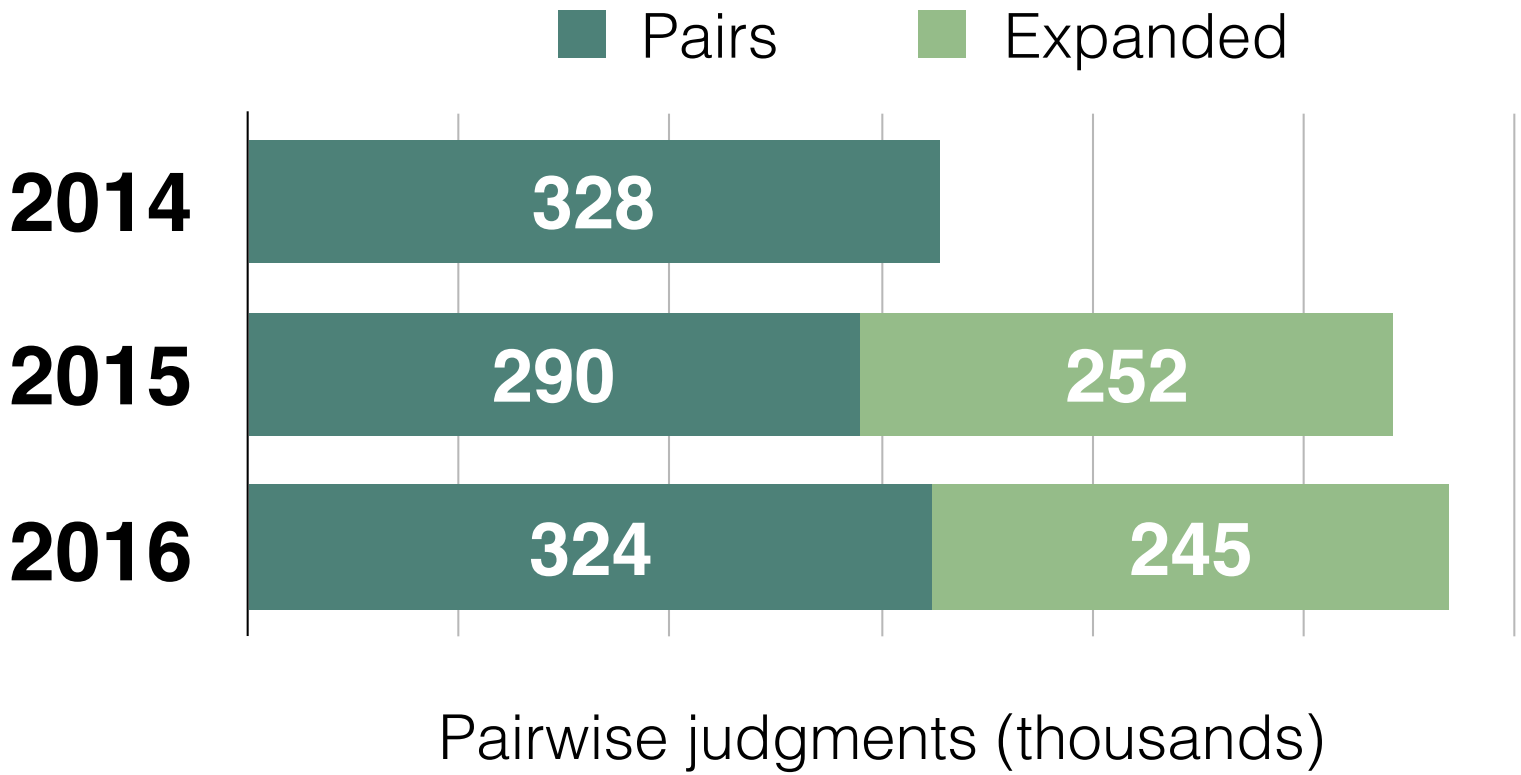
	1	2	3	4	5
AF				•	
B		•			
J					•
H			•		

- Then, distribute rankings across systems:

$$A > B, A = F, A > H, A < J$$
$$B < F, B < H, B < J$$
$$F > H, F < J$$
$$H < J$$

Data collected

- 150 trusted annotators, 939 person-hours

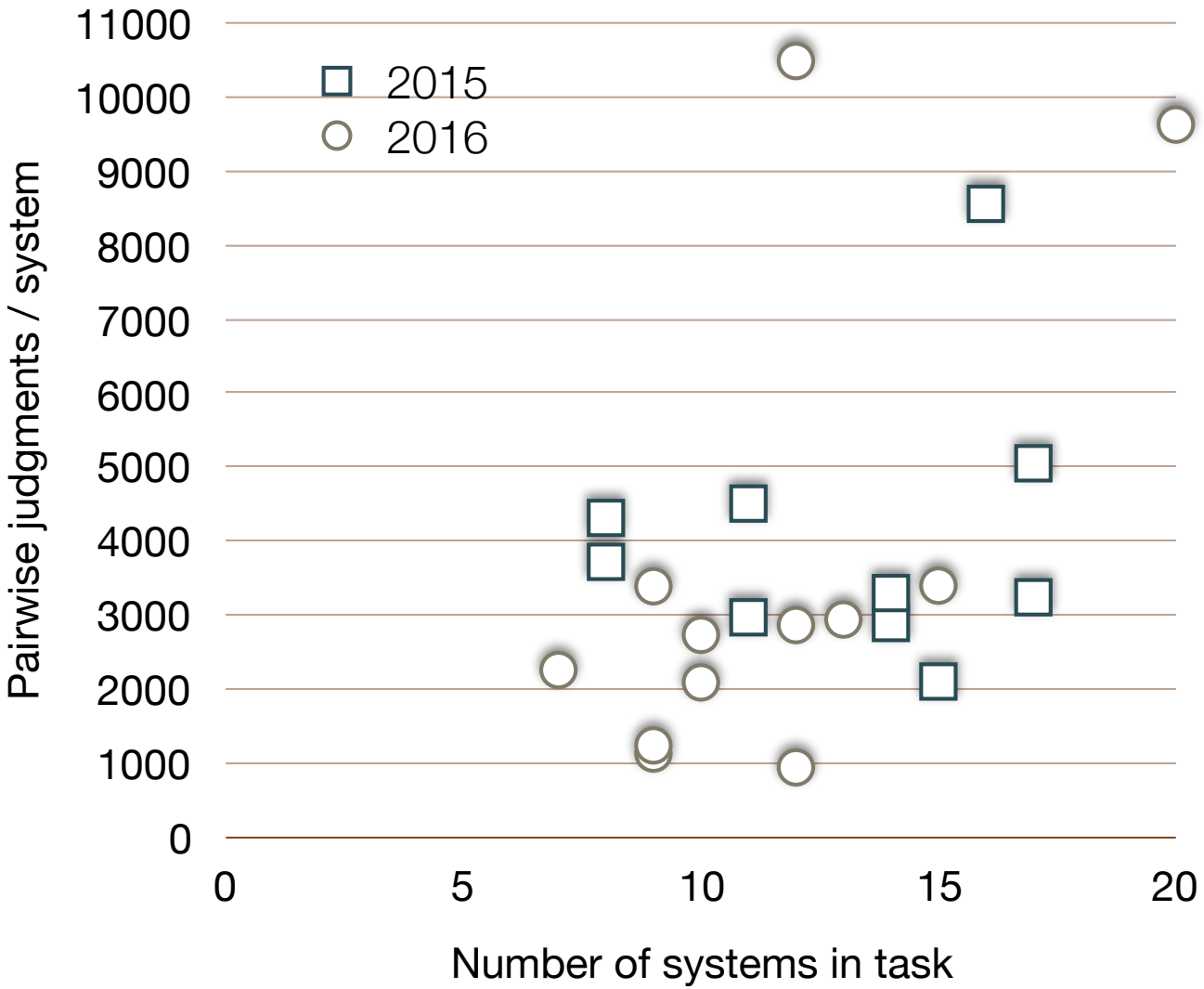


statmt.org/wmt16/results.html

Clustering

- Rank systems using TrueSkill (Herbrich et al., 2006, Sakaguchi et al., 2014)
- Cluster (Koehn, 2012)
  - Aggregate each system's rank over 1,000 bootstrap-resampled folds
  - Throw out top and bottom 25 ranks, collect ranges
  - Groups systems by non-overlapping ranges

Manual evaluation summary



- ~4.1k rankings / task (~3k last year)
- Total judgments: 542k (328k last year)
- Data: statmt.org/wmt16/results.html

Czech–English

cluster	constrained	not constrained
1	uedin-nmt	
2	jhu-pbmt	
3		online-B
4	PJATK, TT-*	
5		online-A
6	cu-mergetrees	

English–Czech

cluster	constrained	not constrained
1	uedin-nmt	
2	nyu-montreal	
3	jhu-pbmt	
4	cu-chimera, cu-tamchyna	
5	uedin-cu-syntax	online-B
6	TT-*	
7		online-A
8	cu-tectomt	
9	tt-usaar-hmm-mert	
10	cu-mergetrees	
11	tt-usaar-hmm-mira	
12	tt-usaar-harm	

Russian–English

cluster	constrained	not constrained
1	amu-uedin,NRC, uedin-nmt	online-G, online-B
2	AFRL-MITLL-phr	online-A
3	AFRL-MITLL-cntr, PROMT-rule	
4		online-F

English–Russian

cluster	constrained	not constrained
1		**promt-rule**
2	amu-uedin, uedin-nmt	online-B, online-G
3	NYU-montreal	
4	jhu-pbmt, limsi, AFRL-MITLL-phr	online-A
5	AFRL-MITLL-verb	
6		online-F

German–English

cluster	constrained	not constrained
1	uedin-nmt	
2	uedin-syntax, kit, uedin-pbmt, jhu-pbmt	online-B, online-A
3	jhu-syntax	online-G
4		online-F

English–German

cluster	constrained	not constrained
1	uedin-nmt	
2	metamind	
3	uedin-syntax	
4	nyu-montreal	
5	kit-limsi, cambridge, promt-rule, kit	online-B, online-A
6	jhu-syntax, jhu-pbmt	
7	uedin-pbmt	online-F, online-G

Romanian–English

cluster	constrained	not constrained
1	uedin-nmt	online-B
2	uedin-pbmt	
3	uedin-syntax, jhu-pbmt, limsi	online-A

English–Romanian

cluster	constrained	not constrained
1	uedin-nmt, qt21-himl-comb	
2	kit, uedin-pbmt, uedin-lmu-hiero, rwth-comb	online-B
3	limsi, lmu-cuni, jhu-pbmt, usfd-rescoring	online-A

Finnish–English

cluster	constrained	not constrained
1		uedin-pbmt, online-G, online-B, uh-opus
2		PROMT-smt
3	uh-factored, uedin-syntax	
4		online-A
5	jhu-pbmt	

English–Finnish

cluster	constrained	not constrained
1	abumatran-nmt, abumatran-cmb	online-G, online-B, uh-opus
2	abumatran-pb, nyu-montreal	online-A
3	jhu-pbmt, uh-factored, aalto, jhu-hltcoe, uut	

Turkish–English

cluster	constrained	not constrained
1		online-B, online-G, online-A
2	tbtk-syscomb, usda	PROMT-smt
3	jhu-syntax, jhu-pbmt, parFDA	

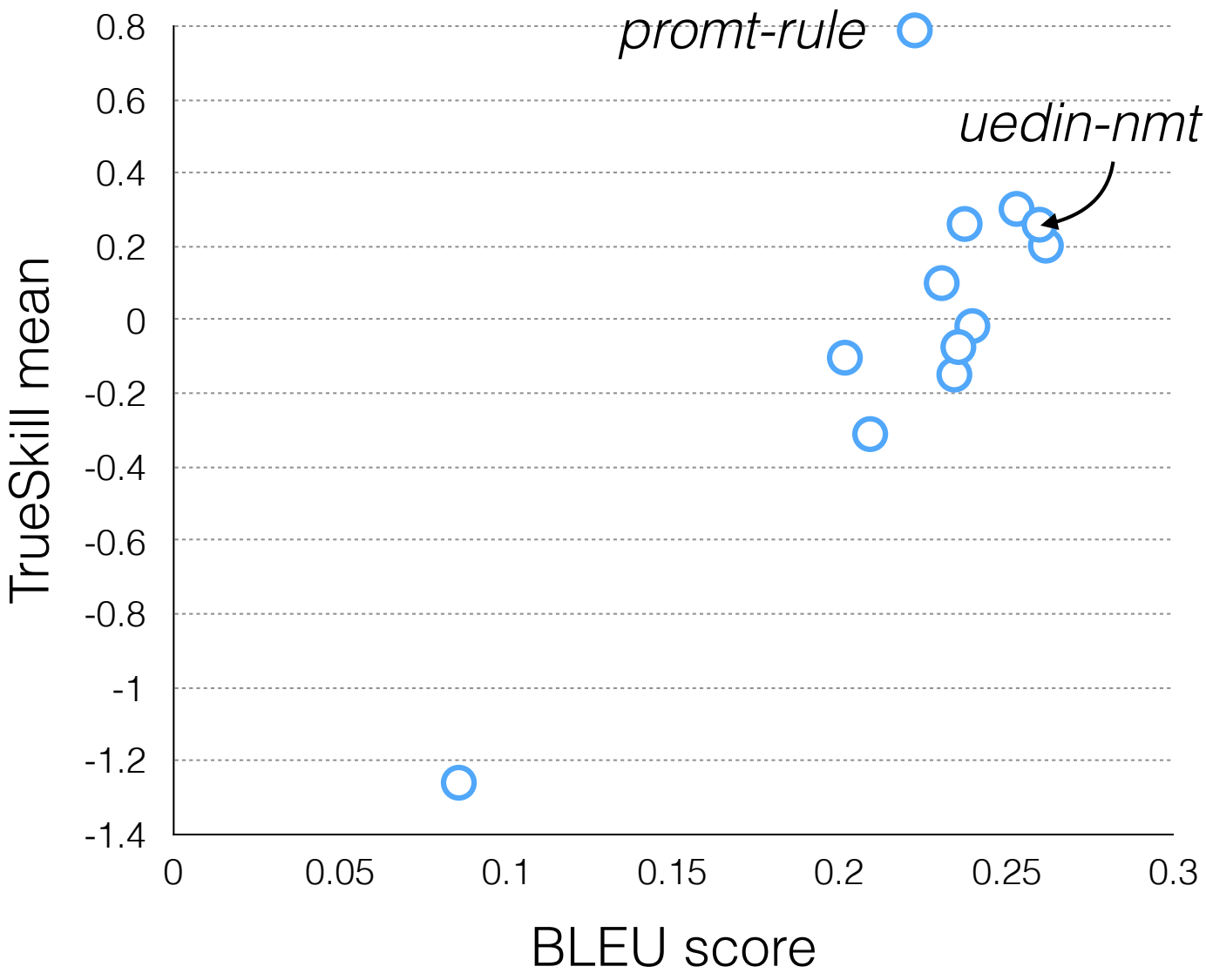
English–Turkish

cluster	constrained	not constrained
1		online-G, online-B
2		online-A
3	ysda	
4	jhu-hltcoe, tbtk-morph, cmu	
5	jhu-pbmt, parFDA	

Trends

- UEdin-NMT
  - 4 languages: uncontested winner
  - 3 languages: tied for first
  - 1 language: tied for second (behind rule-based!)
- English–Russian: rule-based system (PROMT-rule) the winner by a wide margin

Comparison with BLEU



Data

- statmt.org/wmt16/results.html
  - Source and reference data, system outputs
  - Manual evaluation results (raw XML, CSV files with pairwise rankings)

```
srclang,trglang,id,judge,sys1,sys1rank,sys2,sys2rank,group
deu,eng,348,judge13,jhu-syntax,3,online-B,5,190
```

- github.com/cfedermann/wmt16
  - Code used to compute rankings, clusters, annotator agreement

Direct Assessment