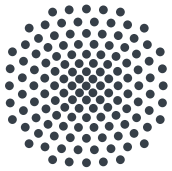


University of Stuttgart
Germany

OP-IMS @ DIACR-Ita: Back to the Roots: SGNS+OP+CD still rocks Semantic Change Detection

December 3, 2020

Jens Kaiser, Dominik Schlechtweg, Sabine Schulte im Walde

Institute for Natural Language Processing, University of Stuttgart, Germany

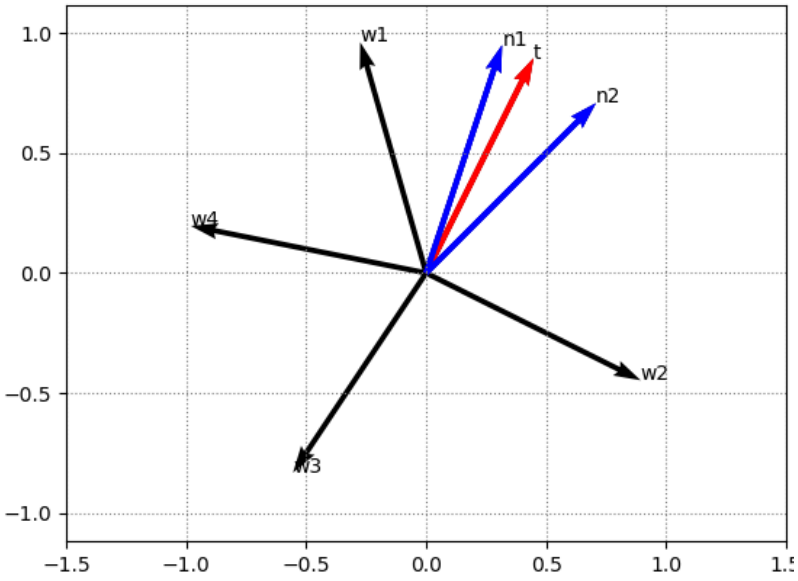
Data and Task

- **given**:
  - set of target words
  - diacronic corpus pair C_1 and C_2
- **task**:
  - decide which words lost or gained sense(s) between C_1 and C_2, and which ones did not (Schlechtweg et al., 2020)
  - dataset contained only words that gained sense(s) (Basile et al., 2020)

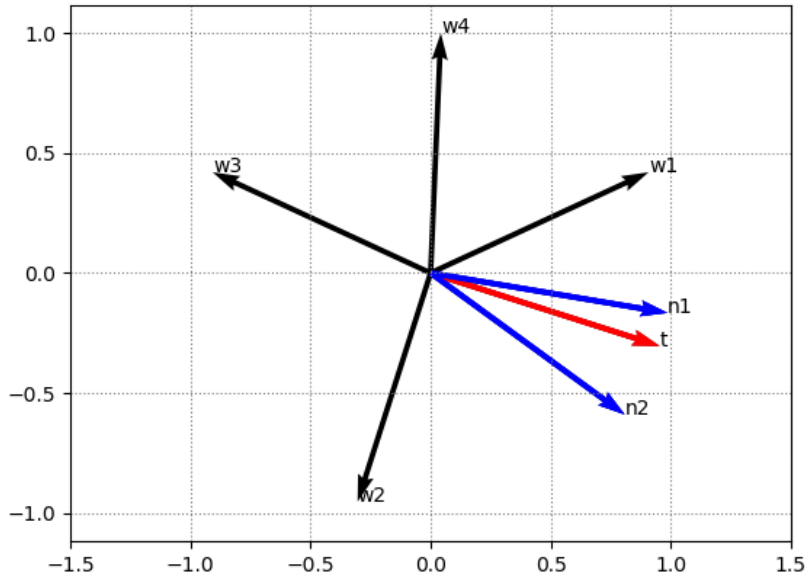
Model

- SGNS+OP+CD (Hamilton, Leskovec, & Jurafsky, 2016)
  1. **Semantic Representation**: Skip-gram with Negative Sampling (Mikolov, Chen, et al., 2013; Mikolov, Sutskever, et al., 2013)
  2. **Alignment**: Orthogonal Procrustes (Schönemann, 1966)
  3. **Change Measure**: Cosine Distance (Salton & McGill, 1983)

SGNS+OP+CD

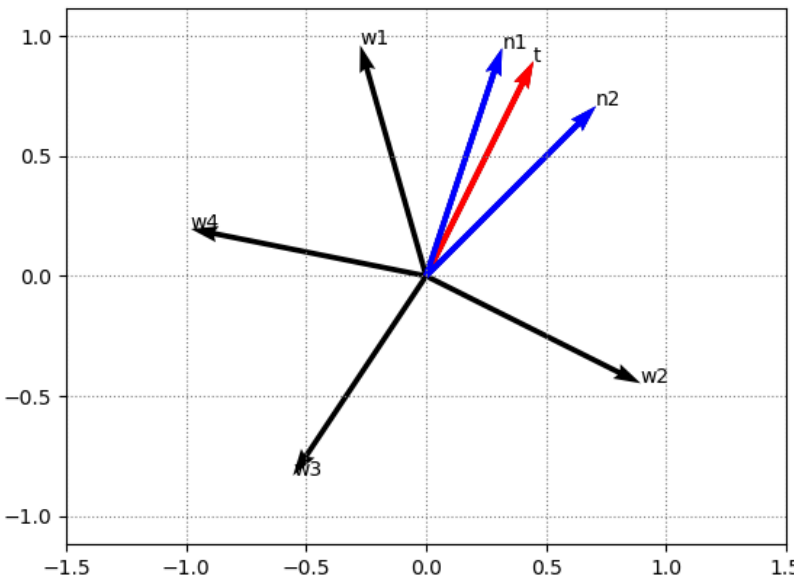


C_1

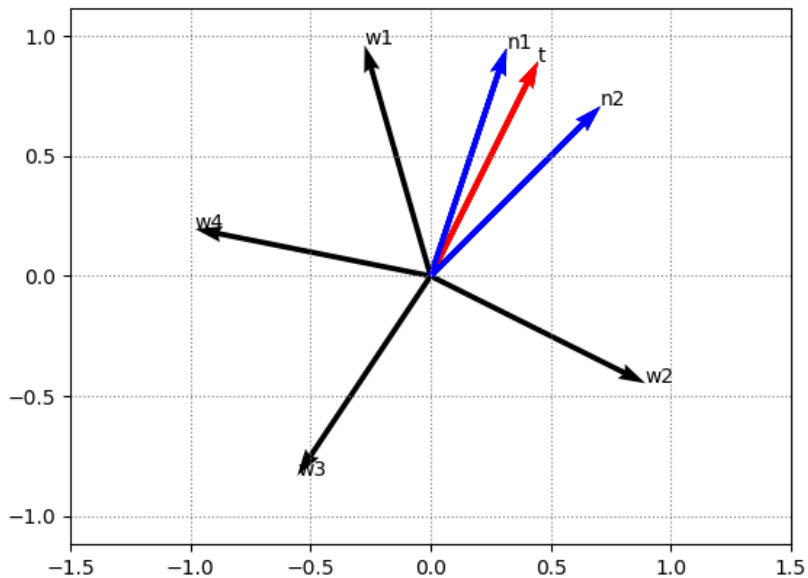


C_2

SGNS+OP+CD



C_1

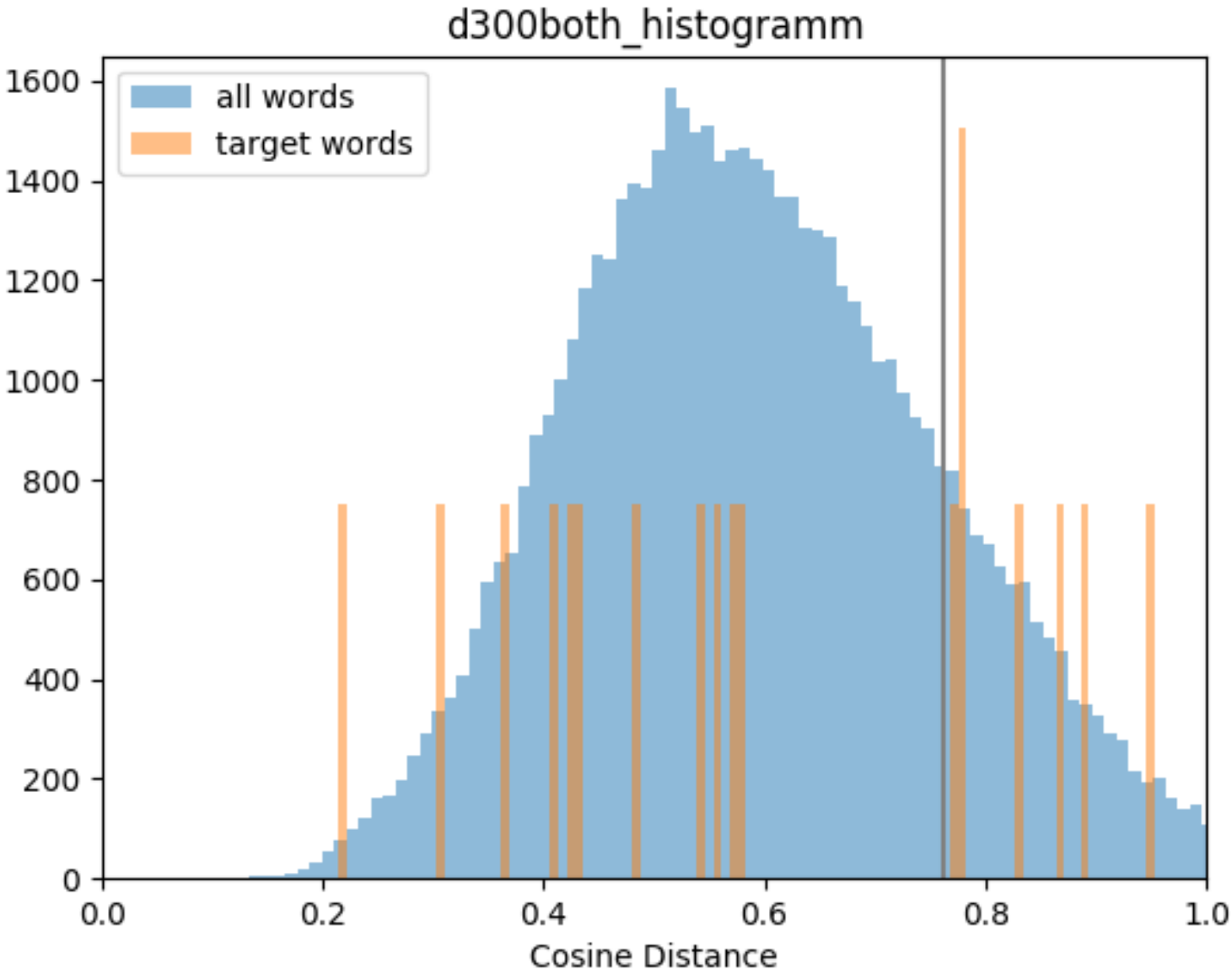


C_2

Why SGNS+OP+CD?

- SemEval 2020: Task 1 (Schlechtweg et al., 2020)
- dominates task (Arefyev & Zhikov, 2020; Pömsl & Lyapin, 2020)
- surprisingly robust (Kaiser et al., 2020)

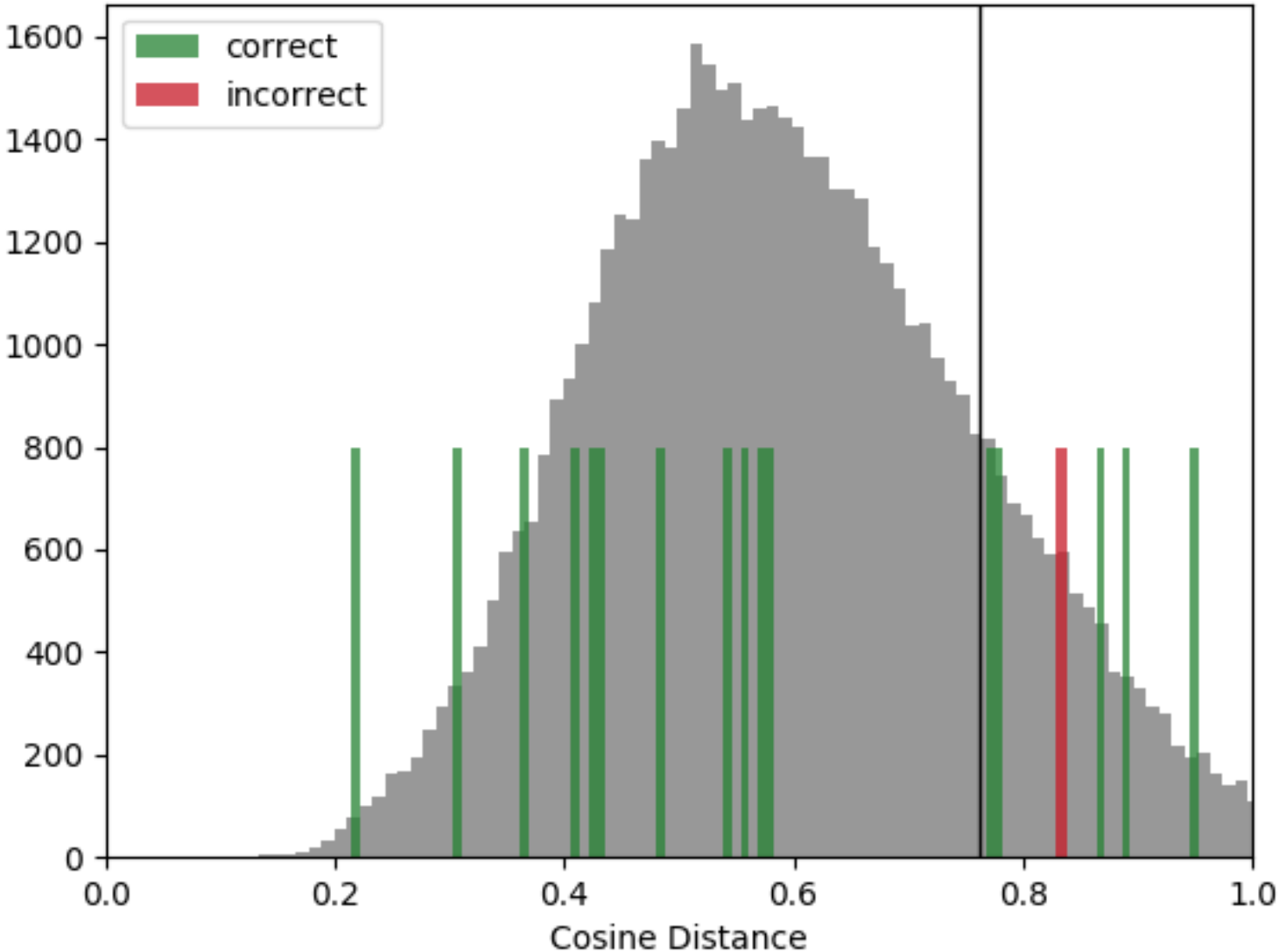
Threshold


d300both_histogramm
all words
target words
1600
1400
1200
1000
800
600
400
200
0
0.0
0.2
0.4
0.6
0.8
1.0
Cosine Distance

Results

entry	dim	threshold		ACC
#2	300	$(\mu+\sigma)$	.76	**.944**
#4	500	$(\mu+\sigma)$	.78	.889
#1	300	(50:50)	.57	.833
#3	500	(50:50)	.64	.833
major. baseline		-		.667
freq. baseline		unk.		.611
colloc. baseline		unk.		.500

Results


correct
incorrect
1600
1400
1200
1000
800
600
400
200
0
0.0
0.2
0.4
0.6
0.8
1.0
Cosine Distance

Conclusion

- **SGNS+OP+CD still rocks Semantic Change Detection**
- near to perfect accuracy of .94
- reproducing results from SemEval 2020: Task 1 (Schlechtweg et al., 2020)
- reproduced by another team (Pražák, Přibáň, & Taylor, 2020)
- off-the-shelf: no annotated data or fine-tuning of parameters
- assumes: graded change is indicative of binary classes

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