## TASK

**motivation**: get a resource to evaluate Distributional Semantic Models that is able to identify semantically related words and to distinguish between different semantic relations (already has been done for English: BLESS dataset by Baroni & Lenci)

## goals:

1. create a list of 200 unambiguous target-words and extract several words for each target belonging to certain relations (5 relations + 3 non-relations: needed to make sure that not every word is seen as related to target  $\rightarrow$ "counterexample")

**2.** evaluate the ability of DSMs to assign relations between words with the created gold-standard-list

RELATA STATISTICS         overall amount of (non-)relata: 18,000         relata count         average relata per tare							
overalla	amount of (non-)relata: 18,000relata countaverage relata per target						
relation	relata count	average relata per targ					
HYPER	1263	6.315					
COORD	2830	14.15					
MERO	998	4.99					
ATTR	1945	9.725					
EVENT	1964	9.82					
NONRN	5091	25.455					
NONRA	1945	9.725					
NONRV	1964	9.82					

# DSMS

- baselines:
  - frequency: each relatum is assigned its frequency (normalized with z-score)
  - random cardinality: each relatum is assigned a random number between 0 and 100,000 (normalized with z-score)
- **cooccurrences**: counts of cooccurrences of each relatum with its target in a window of 2, 5 and 20 content words

REFERENCES: M. Baroni, A. Lenci, How we BLESSED distributional semantic evaluation (2011); M. Baroni, G. Dinu, N. Pham, DISSECT: DIStributional Semantics Composition Toolkit (2013); C. Kunze, L. Lemnitzer, Lexical-semantic and conceptual relations in GermaNet (2008); S. Schulte im Walde, Experiments on the Automatic Induction of German Semantic Verb Classes (2003)

# CUBED Creating and Using a Benchmark for German Distributional Semantic Models Maximilian Bacher, Isabell Wolter Ruprecht-Karls-Universität, Institut für Computerlinguistik, Softwareprojekt Wintersemester 2013/2014





RESC	DURCES	S + RE	ELATA	EXTR	ACTIO	N	
BLESS	<ul> <li>revision for German 200-words target-list</li> <li>translation of meronyms</li> </ul>						
GermaNet	<ul> <li>hypernym</li> <li>coordinate</li> <li>non-relate</li> </ul>	S SS Nouns					
Schulte im Walde	<ul><li>attributes</li><li>events</li></ul>						
SdeWaC	<ul> <li>frequency</li> <li>extraction</li> </ul>	analysis of non-re	elata via Po	ointwise N	Iutual Info	ormation	
	Δνει	RAGF	PRFC	ISION			
frequency ba	aseline:						
HYPER COC 0.24 0.16	RD MERO 0.17	ATTR 0.08	EVENT 0.06	NONRN <b>0.56</b>	NONRA 0.08	NONRV 0.06	
random cardinality baseline:							
HYPERCOC0.070.15	RD MERO 0.05	ATTR 0.11	EVENT 0.11	NONRN <b>0.29</b>	NONRA 0.11	NONRV 0.11	
2 content wo	ords window:						
HYPERCOOI0.080.32	RD MERO 0.06	ATTR 0.18	EVENT 0.15	NONRN <b>0.18</b>	NONRA 0.11	NONRV 0.11	
5 content wo HYPER COO	RD MERO	ATTR	EVENT	NONRN 0 18	NONRA 0 11	NONRV	
						0.10	
20 content w	ords window	V:					
HYPERCOO0.100.31	RD MERO 0.06	ATTR 0.16	EVENT 0.14	NONRN <b>0.18</b>	NONRA 0.12	NONRV 0.11	
	RESS   BLESS   GermaNet   Schulte   Schulte   Walde   SdeWaC   SdeWaC   SdeWaC   SdeWaC   Image: State	RESOURCES         BLESS       • revision for • translation         BLESS       • revision for • translation         GermaNet       • hypernym • coordinate         GermaNet       • non-relata         Schulte im Walde       • attributes • events         Schulte im Walde       • attributes • events         SdeWaC       • frequency • extraction         SdeWaC       • frequency • extraction         frequency baseline: HYPER 0.24       • frequency 0.16         HYPER 0.07       COORD 0.15       MERO 0.05         2 content words window       HYPER 0.06       MERO 0.06         5 content words window       MERO 0.07       0.07         20 content words window       MERO 0.07       0.07         20 content words window       MERO 0.07       0.07	BLESS       • revision for German • translation of mero         BLESS       • hypernyms • coordinates         GermaNet       • hypernyms • coordinates         Schulte in Walde       • hypernyms • coordinates         Schulte in Walde       • attributes • events         Schutte in Walde       • attributes • events         In Page COORD 0.16       MERO 0.05       ATTR 0.01         In Page COORD 0.05       MERO 0.11       ATTR 	RESOURCES + RELATA         • revision for German 200-word         • translation of meronyms         • hypernyms         • coordinates         • non-relata nouns         • attributes         • events         • frequency analysis         • ettraction of non-relata via Poil         SdeWaC         • REVERTE COORD MERO ATTR EVENT         PORD MERO ATTR EVENT         0.06         ATTR EVENT         0.07         ATTR EVENT         0.06         ATTR EVENT         0.07         ATTR EVENT         0.07         0.07         OORD MERO ATTR EVENT         0.00	RESOURCES + RELATA EXTRA         • revision for German 200-words target-1         • translation of meronyms         • hypernyms         • coordinates         GermaNet         • non-relata nouns         Schulte         • attributes         • events         • frequency analysis         SdeWaC         • frequency analysis         • extraction of non-relata via Pointwise M         DECORD MERO ATTR         VENERCESSION         IMPPER COORD MERO ATTR       EVENT NONRN         0.24       0.16       0.17       0.08       0.06       0.56         random cardinality baseline:         HYPER COORD MERO ATTR       EVENT NONRN       0.07       0.15       0.05       0.11       0.11       0.29       2         2 content words window:         HYPER COORD MERO ATTR       EVENT NONRN       0.08       0.32       0.06       0.18       0.15       0.18         0.07       0.16       0.14       0.18         2 content words window:         <	RESOURCES + RELATA EXTRACTION         Prevision for German 200-words target-list         Invision for German 200-words         Schulte         Invision for German 200-words         Invision f	