Automatically Enriching a Thesaurus with Information from Dictionaries

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  - See Princeton WordNet [Fellbaum, 1998]

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  - TeP [Maziero et al., 2008]
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- More **complementary** than overlapping
- Fruitful to **merge** some of them in a unique broader resource

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- Apply the procedure in the enrichment of TeP with PAPEL

Extracting synpairs from dictionaries

- **mente**, n: *cérebro, cabeça, intelecto*
  [**mind**, n: *brain, head, intellect*]

- **máquina**, n: **o mesmo que** *computador*
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- Synonymy graph G
  - All the extracted synpairs
  - Nodes represent words (eg. w_x, w_y)
  - $p = (w_x, w_y)$ establishes an edge between w_x and w_y

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For each synpair $p = (w_x, w_y)$

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4. Compute the adjacency vector $[p] = [w_x] + [w_y]$. The adjacency vector of a word is a column of the matrix M, $[w_j] = [M_j]$;

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5. For each $S_i : S_i \cup S_j = S_j$ and $S_i \cap S_j = S_i$, S_i is discarded.

Coverage of the synpairs by TeP

POS	Synpairs	In TeP	$\|C\|^4 = 0$	$\|C\| = 1$	$\|C\| > 1$	$\|\overline{C}\|$
Nouns	37,452	27.38%	14.98%	12.01%	45.63%	3.86
Verbs	21,465	43.01%	1.34%	4.04%	51.66%	6.64
Adjectives	19,073	37.60%	5.58%	8.22%	48.60%	4.26

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Results – words

Thesaurus	POS	Words			
		Total	Ambiguous	Avg(senses)	Most ambig.
TeP 2.0	Nouns	17,158	5,805	1.71	20
	Verbs	10,827	4,905	2.08	41
	Adjectives	14,586	3,735	1.46	19
After assignments	Nouns	23,775	10,418	2.09	37
	Verbs	12,818	7,094	2.64	42
	Adjectives	17,158	6,294	1.83	22
Clusters	Nouns	8,546	701	1.15	8
	Verbs	502	8	1.02	3
	Adjectives	1,858	39	1.03	4
Final thesaurus	Nouns	30,369	12,045	1.96	38
	Verbs	13,090	7,221	2.62	42
	Adjectives	18,525	6,550	1.80	23

Results – synsets

Thesaurus	POS	Synsets				
		Total	**Avg(size)**	*size* = 2	*size* > 25	*max*(*size*)
TeP 2.0	Nouns	8,254	3.56	3,079	0	21
	Verbs	3,978	5.67	939	48	53
	Adjectives	6,066	3.50	3,033	19	43
After assignments	Nouns	8,254	6.01	1,930	179	150
	Verbs	3,978	8.50	702	217	148
	Adjectives	6,066	5.17	2,369	120	110
Clusters	Nouns	3,524	2.78	2,247	0	13
	Verbs	220	2.34	174	0	6
	Adjectives	820	2.33	656	0	10
Final thesaurus	Nouns	11,778	5.05	4,177	179	150
	Verbs	4,198	8.18	876	217	148
	Adjectives	6,886	4.84	3,025	120	110

Assignments evaluation

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- Two judges for each assignment

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POS	Sample	Correct		Incorrect		Agreement
Nouns	100 assigns. × 2	153	(76.50%)	47	(23.50%)	77.00%
Verbs	100 assigns. × 2	142	(71.00%)	58	(29.00%)	74.00%
Adjectives	100 assigns. × 2	151	(75.50%)	49	(24.50%)	75.00%

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POS	Synpair	Synset	Judge 1	Judge 2
Nouns	(**escrutínio**,votação)	votação;voto;sufrágio	1	1
	(decisão,**desempate**)	resolução;objetivação;tenção;intenção	0	1
	(plano,**gizamento**)	planície;chã;chanura;plaino;plano;planura	0	0
Verbs	(venerar,**homenagear**)	venerar;cultuar;adorar;idolatrar	1	1
	(atacar,**combater**)	atacar;inciar	0	1
	(**obter**,rapar)	depilar;despelar;pelar;raspar;rapar;rascar	0	0
Adjectives	(grandioso,**épico**)	admirável;fabuloso;grandioso	1	1
	(delicado,**requintado**)	difícil;complicado;delicado	0	1
	(**falido**,queimado)	queimado;incendiado	0	0

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Table: Evaluation of clustering

POS	Sample	Correct		Incorrect		Agreement
Nouns	105 × 2	179	(85.24%)	31	(14.76%)	91.43%
Verbs	105 × 2	193	(91.90%)	17	(8.10%)	87.62%
Adjectives	105 × 2	189	(90.00%)	21	(10.00%)	85.71%

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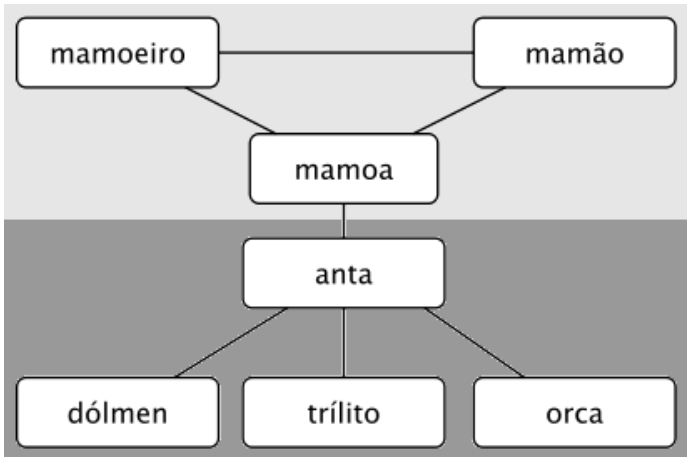

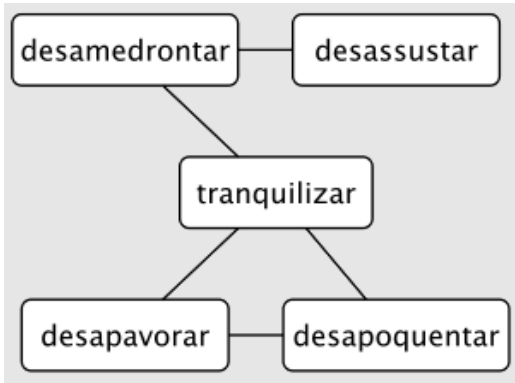

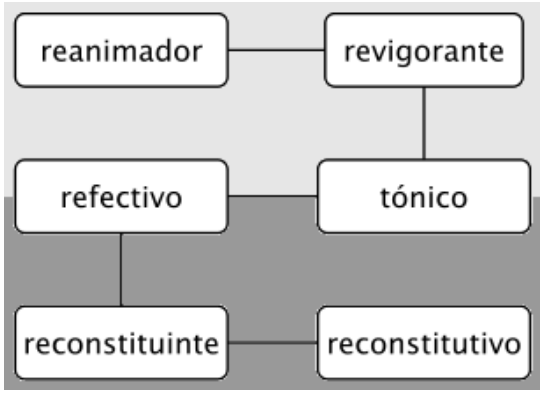

Figure: Examples of connected subgraphs and resulting clusters.

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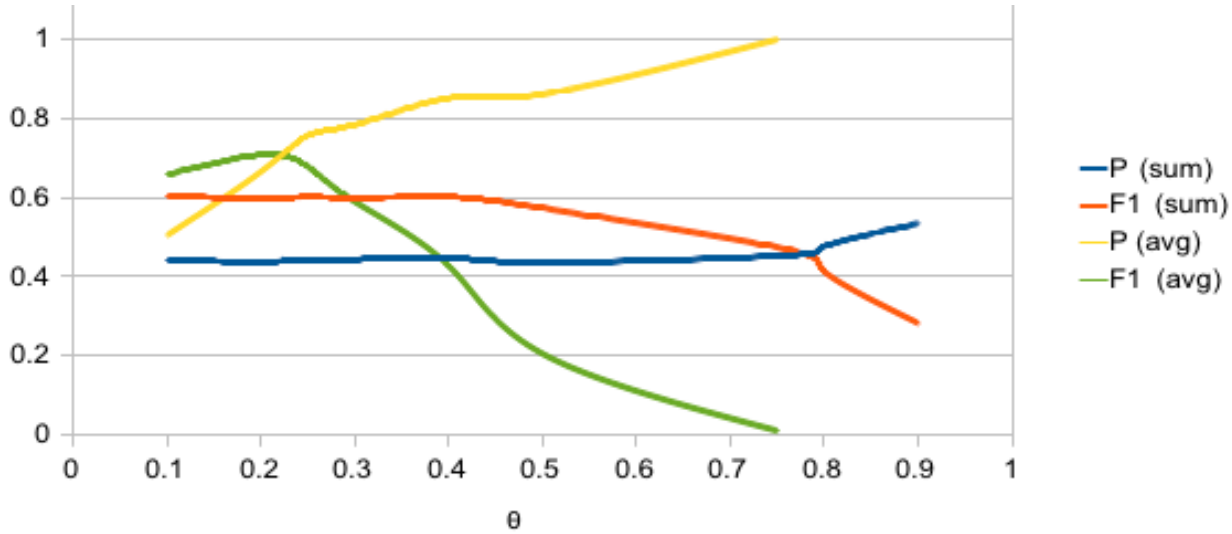

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- Applied to the enrichment of a Portuguese thesaurus
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  - Automatic creation of a lexical ontology for Portuguese
  - Extraction + integration of lexical information from textual sources
  - Soon freely available!
  - Check `http://ontopt.dei.uc.pt`

Thank you!

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