Identification of Multiword Expressions in Parallel Latvian and Lithuanian Corpus (WG3)

PURPOSE

Automatic identification of bi-gram multiword expressions (MWEs) in parallel Latvian and Lithuanian corpora. Our approach uses raw corpora and combination of lexical association measures (LAMs) and supervised machine learning (ML).

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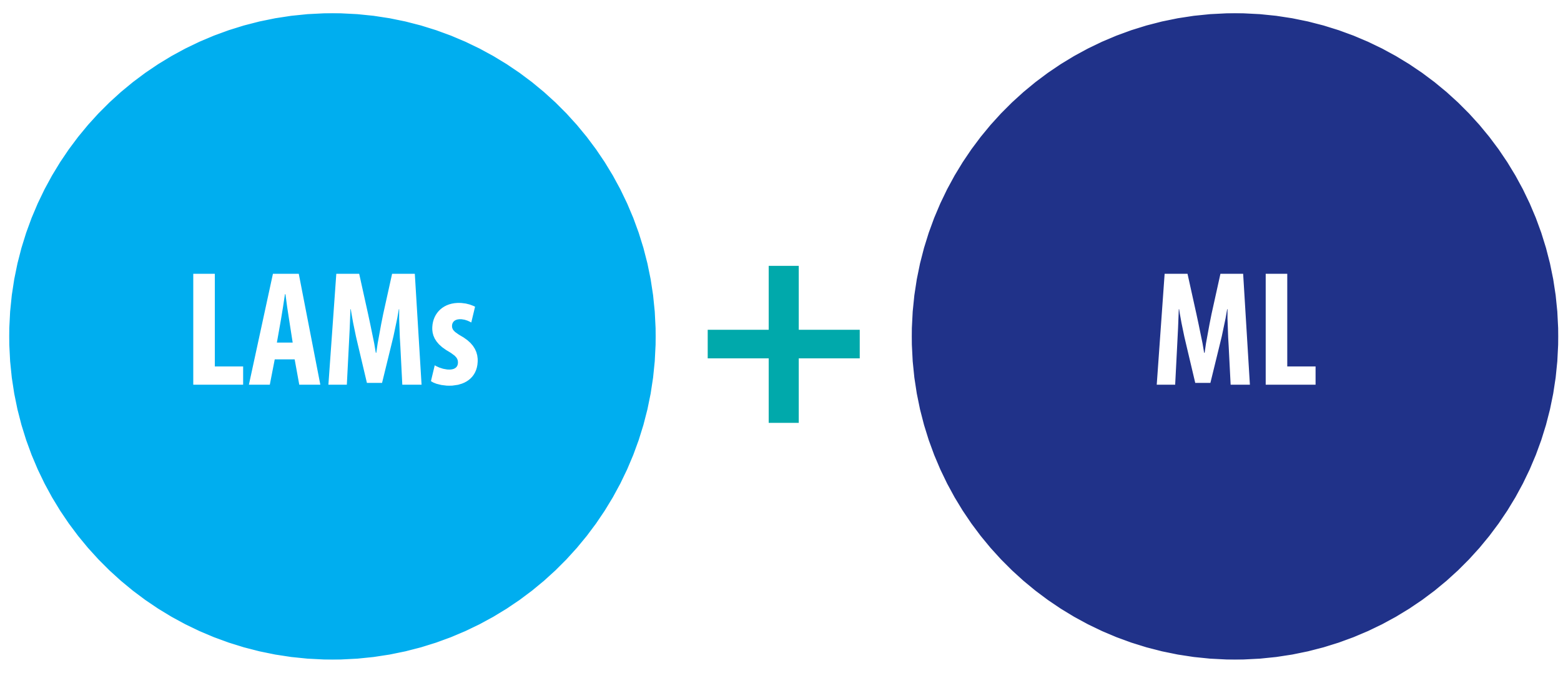


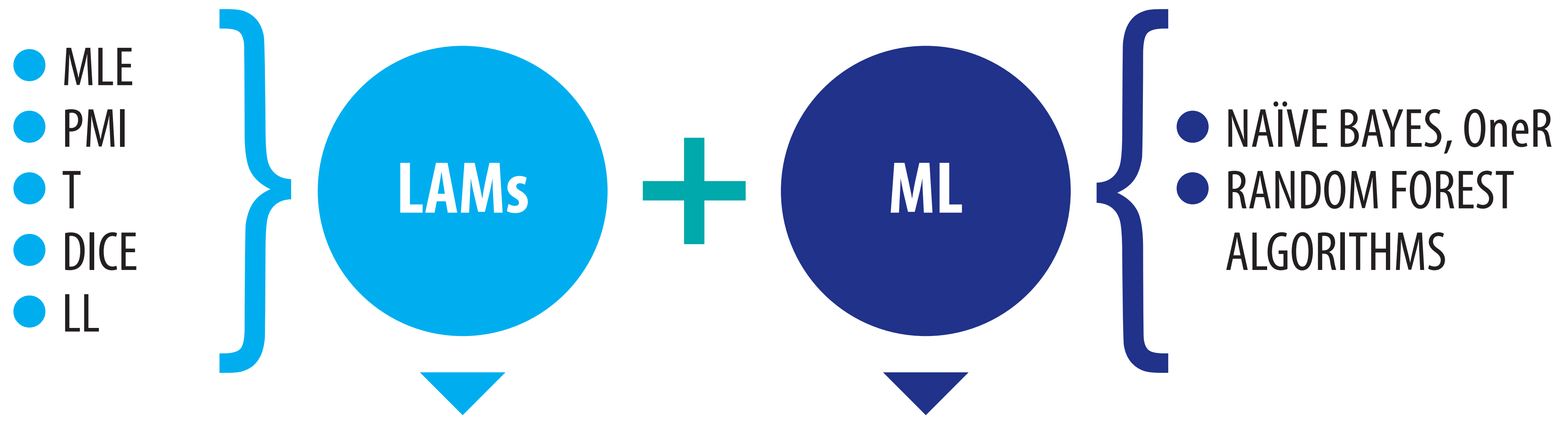
CORPORA AND LEXICAL RESOURCES FOR EVALUATION

1/3 Latvian and Lithuanian parts of JRC-Acquis Multilingual Parallel Corpus (~ *9 mln. words per language*)

EuroVoc, a Multilingual Thesaurus of the European Union, used as reference source for evaluation

- Bi-gram terms
- Separate MWE lists for Latvian (*3608 bi-grams*) and Lithuanian (*Lithuanian - 3783*)

METHOD



- MLE
- PMI
- T
- DICE
- LL

- NAÏVE BAYES, OneR
- RANDOM FOREST ALGORITHMS

Candidate list
Lexical association measures

- MLE (*Maximum Likelihood Estimation*)
- PMI (*Pointwise Mutual Information*)
- T (*Student's t score*)
- DICE (*Dice's coefficient*)
- LL (*Log-likelihood score*)

Reference list
Evaluation against the reference list

MWETOOLKIT

Supervised machine learning algorithms
Filters

- SMOTE (*Synthetic Minority Oversampling TEchnique*)
- Resample

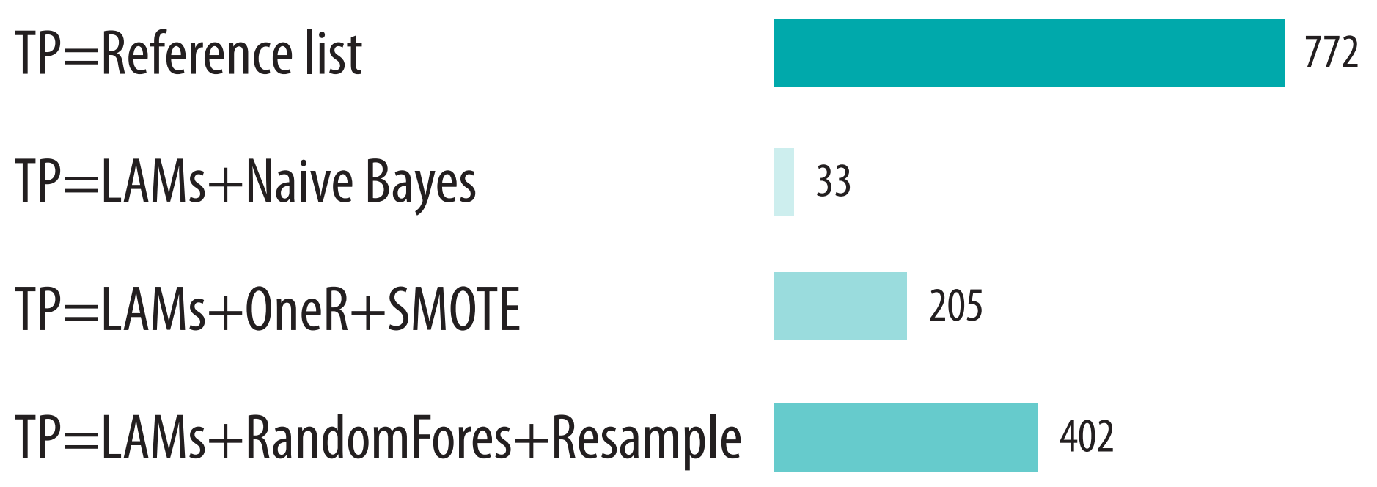
Evaluation
- Precision, Recall, F-measure
- 10-fold cross validation

WEKA

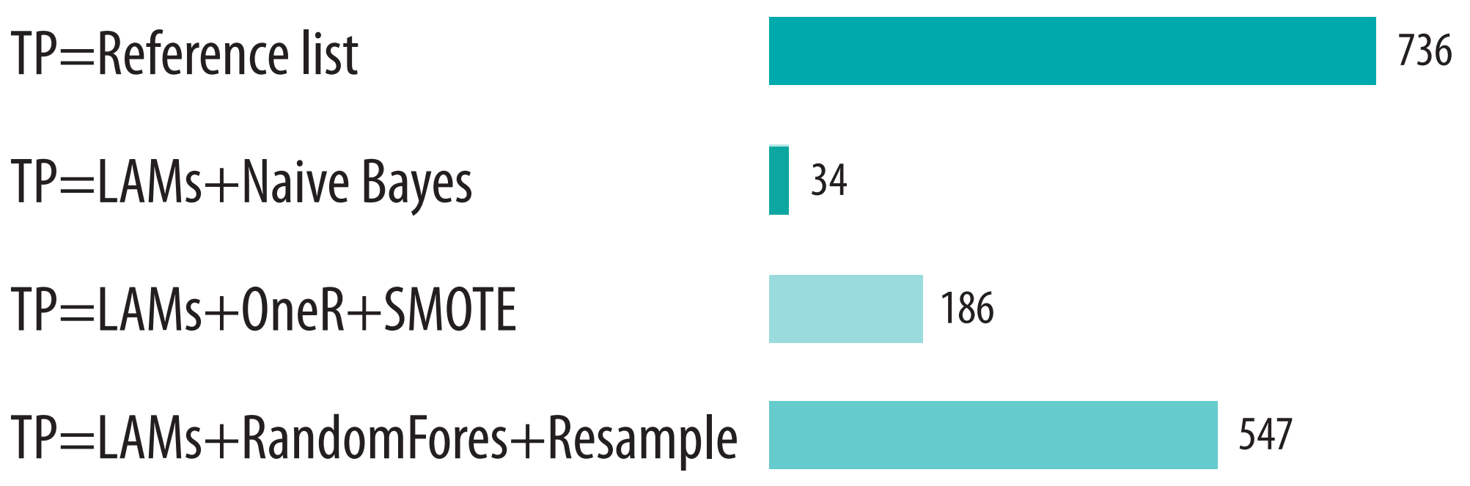
RESULTS

	SCENARIO	PRECISION	RECALL	F-MEAS.
LV	LAMs	0.1%	21.4%	0.3%
	LAMs+NayveBayes	0.6%	4.3%	1.1%
	LAMs+OneR+SMOTE	**100%**	13.3%	23.4%
	LAMs+Random Forest+Resample	92.4%	**52.2%**	**66.7%**
LT	LAMs	0.2%	19.4%	0.2%
	LAMs+NayveBayes	0.6%	4.6%	1.1%
	LAMs+OneR+SMOTE	**100%**	12.6%	22.4%
	LAMs+Random Forest+Resample	95.1%	**77.8%**	**85.6%**

LV = TP IN VARIOUS SCENARIOS



LT = TP IN VARIOUS SCENARIOS



CONCLUSION AND FUTURE PLANS

Extraction of bigram MWEs for Latvian and Lithuanian languages by combining LAMs and supervised ML improved results.

Future plans:

1. Automatic extractions of LT and LV MWEs
2. Experiments with wider set of features and tools, e.g. GIZA++ probability scores