Creating and Analysing Multilingually Comparable Text Corpora

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National Development Plan

Language Technology Initiative
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Agenda

A showcase: the **ParlaMint** corpora

Universal Dependencies: cross-linguistic grammatical annotation and analysis

The task and **the toolkit**

Under the hood: small-scale yet efficient ${}_{L}$LMs for tagging & parsing – **BERT**

Hands-on work

- The grunt work: data acquisition via web scraping
- The actual work: parsing unstructured text into structured data
- Enjoying the fruits: running corpus queries

Comparable and interoperable parliamentary corpora

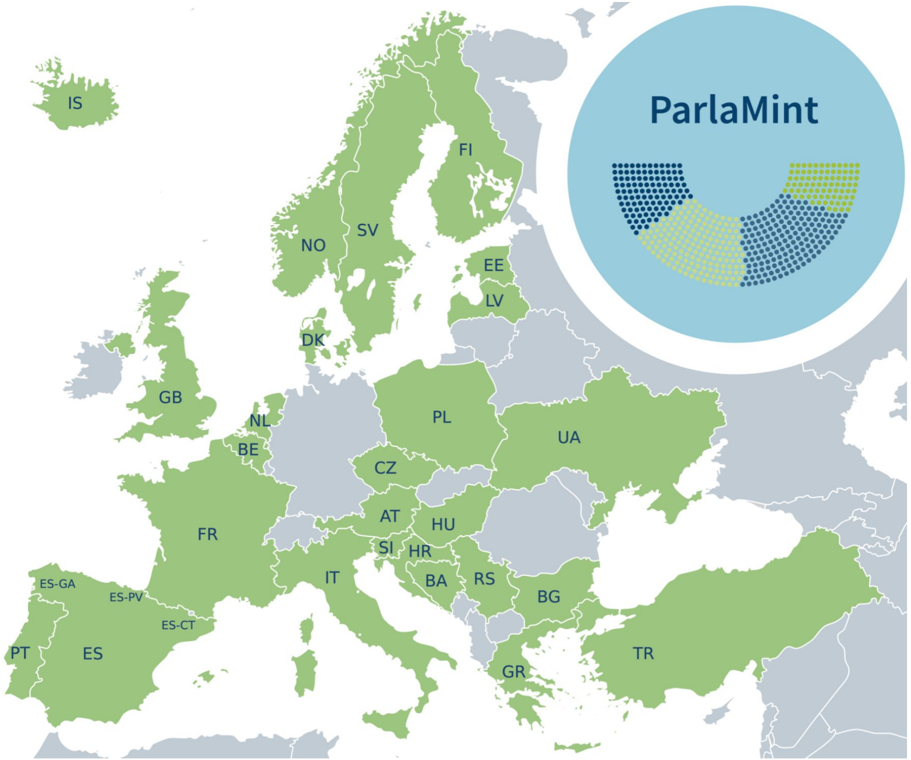
https://www.clarin.eu/parlamint

Version **4.1** contains corpora for **29** countries and autonomous regions

Linguistically annotated corpora: **morphology**, **syntax**, named entities

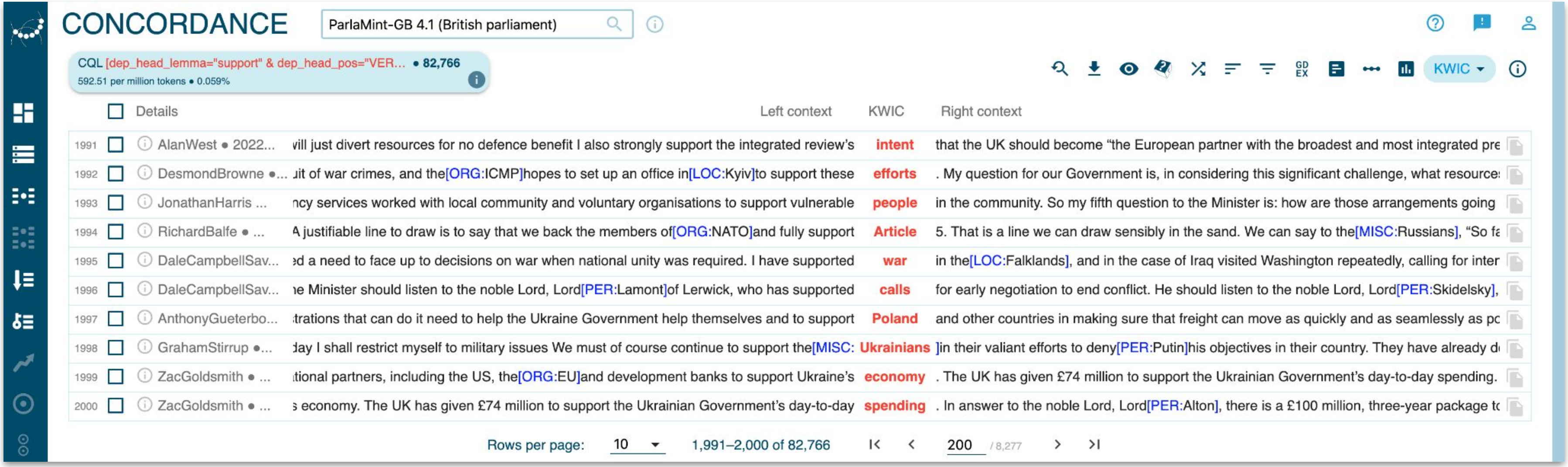
Interoperable* corpora: TEI, **UD**, **VERT**

Open data: http://hdl.handle.net/11356/1912
Open access: https://**www.clarin.si/ske**/#**open**



* FAIR: findability, accessibility, interoperability, reusability

Uniform querying in the ParlaMint corpora



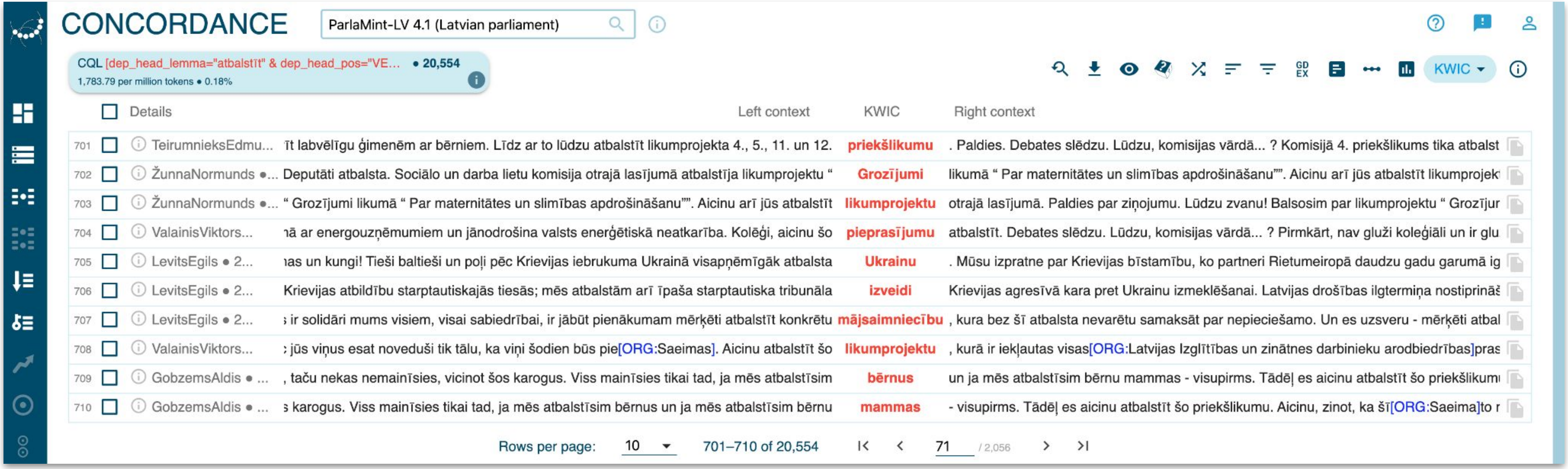
CQL [dep_head_lemma="support" & dep_head_pos="VER... • 82,766
592.51 per million tokens • 0.059%

	□	Details	Left context	KWIC	Right context
1991	□	ⓘ AlanWest • 2022...	vill just divert resources for no defence benefit I also strongly support the integrated review’s	intent	that the UK should become “the European partner with the broadest and most integrated pre
1992	□	ⓘ DesmondBrowne •...	uit of war crimes, and the[ORG:ICMP]hopes to set up an office in[LOC:Kyiv]to support these	efforts	. My question for our Government is, in considering this significant challenge, what resource:
1993	□	ⓘ JonathanHarris ...	ncy services worked with local community and voluntary organisations to support vulnerable	people	in the community. So my fifth question to the Minister is: how are those arrangements going
1994	□	ⓘ RichardBalfe • ...	A justifiable line to draw is to say that we back the members of[ORG:NATO]and fully support	Article	5. That is a line we can draw sensibly in the sand. We can say to the[MISC:Russians], “So fa
1995	□	ⓘ DaleCampbellSav...	ed a need to face up to decisions on war when national unity was required. I have supported	war	in the[LOC:Falklands], and in the case of Iraq visited Washington repeatedly, calling for inter
1996	□	ⓘ DaleCampbellSav...	ne Minister should listen to the noble Lord, Lord[PER:Lamont]of Lerwick, who has supported	calls	for early negotiation to end conflict. He should listen to the noble Lord, Lord[PER:Skidelsky],
1997	□	ⓘ AnthonyGueterbo...	trations that can do it need to help the Ukraine Government help themselves and to support	Poland	and other countries in making sure that freight can move as quickly and as seamlessly as pc
1998	□	ⓘ GrahamStirrup •...	day I shall restrict myself to military issues We must of course continue to support the[MISC:	Ukrainians	]in their valiant efforts to deny[PER:Putin]his objectives in their country. They have already d
1999	□	ⓘ ZacGoldsmith • ...	tional partners, including the US, the[ORG:EU]and development banks to support Ukraine’s	economy	. The UK has given £74 million to support the Ukrainian Government’s day-to-day spending.
2000	□	ⓘ ZacGoldsmith • ...	s economy. The UK has given £74 million to support the Ukrainian Government’s day-to-day	spending	. In answer to the noble Lord, Lord[PER:Alton], there is a £100 million, three-year package tc

Rows per page: 10 ▾ 1,991–2,000 of 82,766 |< < 200 / 8,277 > >|

```
[dep_head_lemma="support"
 & dep_head_pos="VERB"
 & dep="obj" & pos="NOUN|PROPN"]
```

Uniform querying in the ParlaMint corpora



CONCORDANCE

ParlaMint-LV 4.1 (Latvian parliament)

CQL [dep_head_lemma="atbalstīt" & dep_head_pos="VE... • 20,554
1,783.79 per million tokens • 0.18%

KWIC

	☐ Details	Left context	KWIC	Right context
701	☐ ⓘ TeirumnieksEdmu...	īt labvēlīgu ģimenēm ar bērniem. Līdz ar to lūdzu atbalstīt likumprojekta 4., 5., 11. un 12.	**priekšlikumu**	. Paldies. Debates slēdzu. Lūdzu, komisijas vārdā... ? Komisijā 4. priekšlikums tika atbalst
702	☐ ⓘ ŽunnaNormunds •...	Deputāti atbalsta. Sociālo un darba lietu komisija otrajā lasījumā atbalstīja likumprojektu “	**Grozījumi**	likumā “ Par maternitātes un slimības apdrošināšanu””. Aicinu arī jūs atbalstīt likumprojek
703	☐ ⓘ ŽunnaNormunds •...	“ Grozījumi likumā “ Par maternitātes un slimības apdrošināšanu””. Aicinu arī jūs atbalstīt	**likumprojektu**	otrajā lasījumā. Paldies par ziņojumu. Lūdzu zvanu! Balsosim par likumprojektu “ Grozījur
704	☐ ⓘ ValainisViktors...	ıā ar energouzņēmumiem un jānodrošina valsts enerģētiskā neatkarība. Kolēģi, aicinu šo	**pieprasījumu**	atbalstīt. Debates slēdzu. Lūdzu, komisijas vārdā... ? Pirmkārt, nav gluži koleģiāli un ir glu
705	☐ ⓘ LevitsEgils • 2...	ıas un kungi! Tieši baltieši un poļi pēc Krievijas iebrukuma Ukrainā visapņēmīgāk atbalsta	**Ukrainu**	. Mūsu izpratne par Krievijas bīstamību, ko partneri Rietumeiropā daudzu gadu garumā ig
706	☐ ⓘ LevitsEgils • 2...	Krievijas atbildību starptautiskajās tiesās; mēs atbalstām arī īpaša starptautiska tribunāla	**izveidi**	Krievijas agresīvā kara pret Ukrainu izmeklēšanai. Latvijas drošības ilgtermiņa nostiprinā:
707	☐ ⓘ LevitsEgils • 2...	; ir solidāri mums visiem, visai sabiedrībai, ir jābūt pienākumam mērķēti atbalstīt konkrētu	**mājsaimniecību**	, kura bez šī atbalsta nevarētu samaksāt par nepieciešamo. Un es uzsveru - mērķēti atbal
708	☐ ⓘ ValainisViktors...	: jūs viņus esat noveduši tik tālu, ka viņi šodien būs pie[ORG:Saeimas]. Aicinu atbalstīt šo	**likumprojektu**	, kurā ir iekļautas visas[ORG:Latvijas Izglītības un zinātnes darbinieku arodbiedrības]pras
709	☐ ⓘ GobzemsAldis • ...	, taču nekas nemainīsies, vicinot šos karogus. Viss mainīsies tikai tad, ja mēs atbalstīsim	**bērnus**	un ja mēs atbalstīsim bērnu mammas - visupirms. Tādēļ es aicinu atbalstīt šo priekšlikumı
710	☐ ⓘ GobzemsAldis • ...	s karogus. Viss mainīsies tikai tad, ja mēs atbalstīsim bērnus un ja mēs atbalstīsim bērnu	**mammas**	- visupirms. Tādēļ es aicinu atbalstīt šo priekšlikumu. Aicinu, zinot, ka šī[ORG:Saeima]to r

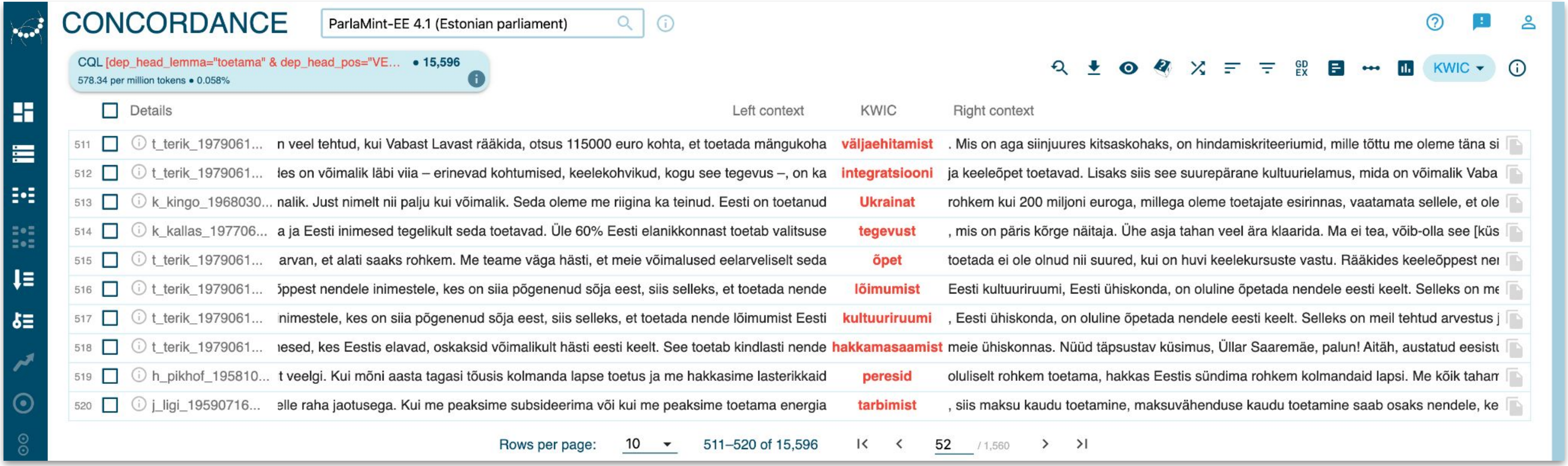
Rows per page: 10 ▾ 701–710 of 20,554 |< < 71 / 2,056 > >|

```
[dep_head_lemma="atbalstīt"
 & dep_head_pos="VERB"
 & dep="obj" & pos="NOUN|PROPN"]
```

CLARIN.SI

NoSketch Engine

Uniform querying in the ParlaMint corpora



CONCORDANCE

ParlaMint-EE 4.1 (Estonian parliament)

CQL [dep_head_lemma="toetama" & dep_head_pos="VE… • 15,596
578.34 per million tokens • 0.058%

KWIC

	☐	Details	Left context	KWIC	Right context
511	☐	ⓘ t_terik_1979061…	n veel tehtud, kui Vabast Lavast rääkida, otsus 115000 euro kohta, et toetada mängukoha	**väljaehitamist**	. Mis on aga siinjuures kitsaskohaks, on hindamiskriteeriumid, mille tõttu me oleme täna si
512	☐	ⓘ t_terik_1979061…	les on võimalik läbi viia – erinevad kohtumised, keelekohvikud, kogu see tegevus –, on ka	**integratsiooni**	ja keeleõpet toetavad. Lisaks siis see suurepärane kultuurielamus, mida on võimalik Vaba
513	☐	ⓘ k_kingo_1968030…	nalik. Just nimelt nii palju kui võimalik. Seda oleme me riigina ka teinud. Eesti on toetanud	**Ukrainat**	rohkem kui 200 miljoni euroga, millega oleme toetajate esirinnas, vaatamata sellele, et ole
514	☐	ⓘ k_kallas_197706…	a ja Eesti inimesed tegelikult seda toetavad. Üle 60% Eesti elanikkonnast toetab valitsuse	**tegevust**	, mis on päris kõrge näitaja. Ühe asja tahan veel ära klaarida. Ma ei tea, võib-olla see [küs
515	☐	ⓘ t_terik_1979061…	arvan, et alati saaks rohkem. Me teame väga hästi, et meie võimalused eelarveliselt seda	**õpet**	toetada ei ole olnud nii suured, kui on huvi keelekursuste vastu. Rääkides keeleõppest nei
516	☐	ⓘ t_terik_1979061…	ɔppest nendele inimestele, kes on siia põgenenud sõja eest, siis selleks, et toetada nende	**lõimumist**	Eesti kultuuriruumi, Eesti ühiskonda, on oluline õpetada nendele eesti keelt. Selleks on me
517	☐	ⓘ t_terik_1979061…	ınimestele, kes on siia põgenenud sõja eest, siis selleks, et toetada nende lõimumist Eesti	**kultuuriruumi**	, Eesti ühiskonda, on oluline õpetada nendele eesti keelt. Selleks on meil tehtud arvestus j
518	☐	ⓘ t_terik_1979061…	ıesed, kes Eestis elavad, oskaksid võimalikult hästi eesti keelt. See toetab kindlasti nende	**hakkamasaamist**	meie ühiskonnas. Nüüd täpsustav küsimus, Üllar Saaremäe, palun! Aitäh, austatud eesistu
519	☐	ⓘ h_pikhof_195810…	t veelgi. Kui mõni aasta tagasi tõusis kolmanda lapse toetus ja me hakkasime lasterikkaid	**peresid**	oluliselt rohkem toetama, hakkas Eestis sündima rohkem kolmandaid lapsi. Me kõik taham
520	☐	ⓘ j_ligi_19590716…	ɘlle raha jaotusega. Kui me peaksime subsideerima või kui me peaksime toetama energia	**tarbimist**	, siis maksu kaudu toetamine, maksuvähenduse kaudu toetamine saab osaks nendele, ke

Rows per page: 10 ▾ 511–520 of 15,596 |< < 52 / 1,560 > >|

```
[dep_head_lemma="toetama"
 & dep_head_pos="VERB"
 & dep="obj" & pos="NOUN|PROPN"]
```

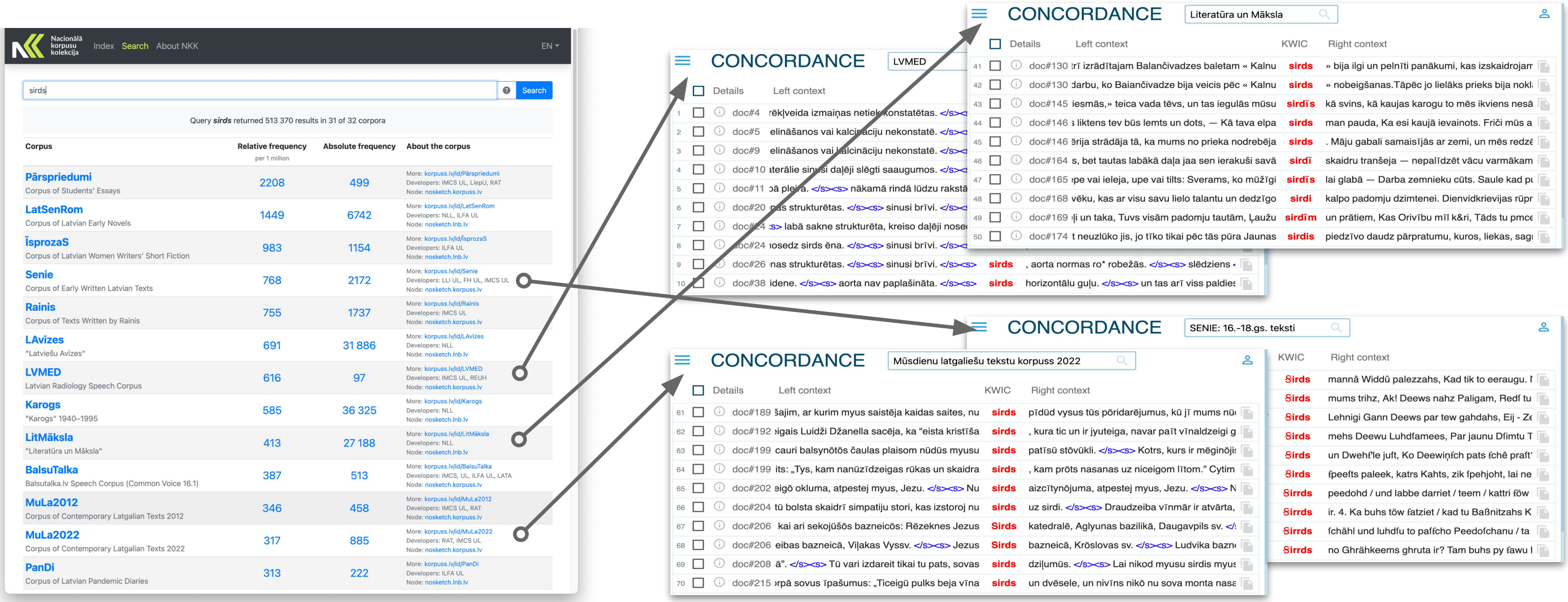
CLARIN.SI

NoSketch Engine

Korpuss.lv: Latvian National Corpora Collection

- 39 corpora by **13** institutions, **2.8B** tokens
- **Unified** morpho-syntactic annotations
- **Federated** search, frequencies, timelines

text (30) speech (7) general (11) specialised (26) morphology (31) syntax (3) semantics (1)
error annotation (2) manually annotated (5) web (2) learner (2) literary (4) parallel (1)
parliamentary (1) diahronic (2) newspapers (5) representative (9) latgalian (3) blog (2)



sirds

Query ***sirds*** returned 513 370 results in 31 of 32 corpora

Corpus	Relative frequency per 1 million	Absolute frequency	About the corpus
Pārspriedumi Corpus of Students' Essays	2208	499	More: korpuss.lv/id/Pārspriedumi Developers: IMCS UL, LiepU, RAT Node: nosketch.korpuss.lv
LatSenRom Corpus of Latvian Early Novels	1449	6742	More: korpuss.lv/id/LatSenRom Developers: NLL, ILFA UL Node: nosketch.lnb.lv
ĪsprozaS Corpus of Latvian Women Writers' Short Fiction	983	1154	More: korpuss.lv/id/ĪsprozaS Developers: ILFA UL Node: nosketch.lnb.lv
Senie Corpus of Early Written Latvian Texts	768	2172	More: korpuss.lv/id/Senie Developers: LLI UL, FH UL, IMCS UL Node: nosketch.korpuss.lv
Rainis Corpus of Texts Written by Rainis	755	1737	More: korpuss.lv/id/Rainis Developers: IMCS UL Node: nosketch.korpuss.lv
LAvīzes "Latviešu Avīzes"	691	31 886	More: korpuss.lv/id/LAvīzes Developers: NLL Node: nosketch.lnb.lv
LVMED Latvian Radiology Speech Corpus	616	97	More: korpuss.lv/id/LVMED Developers: IMCS UL, REUH Node: nosketch.korpuss.lv
Karogs "Karogs" 1940–1995	585	36 325	More: korpuss.lv/id/Karogs Developers: NLL Node: nosketch.lnb.lv
LitMāksla "Literatūra un Māksla"	413	27 188	More: korpuss.lv/id/LitMāksla Developers: NLL Node: nosketch.lnb.lv
BalsuTalka Balsutalka.lv Speech Corpus (Common Voice 16.1)	387	513	More: korpuss.lv/id/BalsuTalka Developers: IMCS, UL, ILFA UL, LATA Node: nosketch.korpuss.lv
MuLa2012 Corpus of Contemporary Latgalian Texts 2012	346	458	More: korpuss.lv/id/MuLa2012 Developers: IMCS UL, RAT Node: nosketch.korpuss.lv
MuLa2022 Corpus of Contemporary Latgalian Texts 2022	317	885	More: korpuss.lv/id/MuLa2022 Developers: RAT, IMCS UL Node: nosketch.korpuss.lv
PanDi Corpus of Latvian Pandemic Diaries	313	222	More: korpuss.lv/id/PanDi Developers: ILFA UL Node: nosketch.lnb.lv

CONCORDANCE — Literatūra un Māksla

	Details	Left context	KWIC	Right context
41	doc#130	trī izrādītajam Balančivadzes baletam « Kalnu	sirds	» bija ilgi un pelnīti panākumi, kas izskaidrojam
42	doc#130	darbu, ko Baiančivadze bija veicis pēc « Kalnu	sirds	» nobeigšanas.Tāpēc jo lielāks prieks bija nokl
43	doc#145	iesmās,» teica vada tēvs, un tas iegulās mūsu	sirdīs	kā svins, kā kaujas karogu to mēs ikviens nesā
44	doc#146	s liktens tev būs lemts un dots, — Kā tava elpa	sirds	man pauda, Ka esi kaujā ievainots. Friči mūs a
45	doc#146	ērija strādāja tā, ka mums no prieka nodrebēja	sirds	. Māju gabali samaisījās ar zemi, un mēs redzē
46	doc#164	s, bet tautas labākā daļa jaa sen ierakuši savā	sirdī	skaidru tranšeja — nepalīdzēt vācu varmākam
47	doc#165	pe vai ieleja, upe vai tilts: Sverams, ko mūžīgi	sirdīs	lai glabā — Darba zemnieku cūts. Saule kad pu
48	doc#168	vēku, kas ar visu savu lielo talantu un dedzīgo	sirdi	kalpo padomju dzimtenei. Dienvidkrievijas rūpr
49	doc#169	ļi un taka, Tuvs visām padomju tautām, Ļaužu	sirdīm	un prātiem, Kas Orivību mīl k&ri, Tāds tu pmce
50	doc#174	t neuzlūko jis, jo tīko tikai pēc tās pūra Jaunas	sirdis	piedzīvo daudz pārpratumu, kuros, liekas, sag

CONCORDANCE — LVMED

	Details	Left context	KWIC	Right context
1	doc#4	rēkļveida izmaiņas netiek konstatētas. </s><		
2	doc#5	elināšanos vai kalcināciju nekonstatē. </s><		
3	doc#9	elināšanos vai kalcināciju nekonstatē. </s><		
4	doc#10	aterālie sinusi daļēji slēgti saaugumos. </s><		
5	doc#11	pā pleira. </s><s> nākamā rindā lūdzu rakstā		
6	doc#20	nas strukturētas. </s><s> sinusi brīvi. </s><		
7	doc#24	s> labā sakne strukturēta, kreiso daļēji nosec		
8	doc#24	nosedz sirds ēna. </s><s> sinusi brīvi. </s><		
9	doc#26	nas strukturētas. </s><s> sinusi brīvi. </s><s>	sirds	, aorta normas ro* robežās. </s><s> slēdziens ‹
10	doc#38	idene. </s><s> aorta nav paplašināta. </s><s>	sirds	horizontālu guļu. </s><s> un tas arī viss paldies

CONCORDANCE — SENIE: 16.-18.gs. teksti

KWIC	Right context
Ꞩirds	mannâ Widdû palezzahs, Kad tik to eeraugu. I
Ꞩirds	mums trihz, Ak! Deews nahz Paligam, Redſ tu
Ꞩirds	Lehnigi Gann Deews par tew gahdahs, Eij - Ze
Ꞩirds	mehs Deewu Luhdſamees, Par jaunu Dſimtu T
Ꞩirds	un Dwehſ'le juſt, Ko Deewiņſch pats ſchê praſt'
Ꞩirds	ſpeeſts paleek, katrs Kahts, zik ſpehjoht, lai ne
Ꞩirrds	peedohd / und labbe darriet / teem / kattri ſöw
Ꞩirrds	ir. 4. Ka buhs töw ſatziet / kad tu Baßnitzahs K
Ꞩirrds	ſchähl und luhdſu to paſſcho Peedoſchanu / ta
Ꞩirrds	no Ghrähkeems ghruta ir? Tam buhs py ſawu I

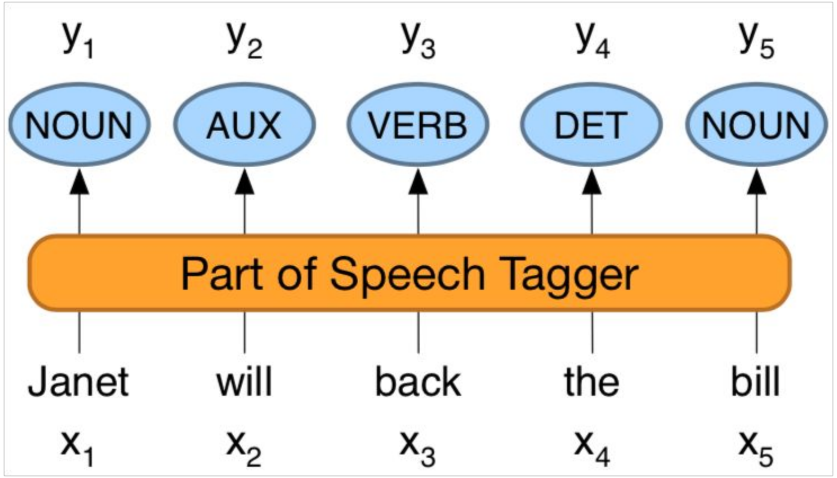
CONCORDANCE — Mūsdienu latgaliešu tekstu korpuss 2022

	Details	Left context	KWIC	Right context
61	doc#189	šajim, ar kurim myus saistēja kaidas saites, nu	sirds	pīdūd vysus tūs pōridarējumus, kū jī mums nū
62	doc#192	eigais Luidži Džanella sacēja, ka “eista kristīša	sirds	, kura tic un ir jyuteiga, navar paīt vīnaldzeigi g
63	doc#199	cauri balsynōtōs čaulas plaisom nūdūs myusu	sirds	patīsū stōvūkli. </s><s> Kotrs, kurs ir mēginōjis
64	doc#199	its: „Tys, kam nanūzīdzeigas rūkas un skaidra	sirds	, kam prōts nasanas uz niceigom lītom.” Cytim
65	doc#202	eigō okluma, atpestej myus, Jezu. </s><s> Nu	sirds	aizcītynōjuma, atpestej myus, Jezu. </s><s> N
66	doc#204	tū bolsta skaidrī simpatiju stori, kas izstoroj nu	sirds	uz sirdi. </s><s> Draudzeiba vīnmār ir atvārta,
67	doc#206	kai ari sekojūšōs bazneicōs: Rēzeknes Jezus	Sirds	katedralē, Aglyunas bazilikā, Daugavpils sv. </
68	doc#206	eibas bazneicā, Viļakas Vyssv. </s><s> Jezus	Sirds	bazneicā, Krōslovas sv. </s><s> Ludvika bazn
69	doc#208	ā”. </s><s> Tū vari izdareit tikai tu pats, sovas	sirds	dziļumūs. </s><s> Lai nikod myusu sirdis myus
70	doc#215	rpā sovus īpašumus: „Ticeigū pulks beja vīna	sirds	un dvēsele, un nivīns nikō nu sova monta nasa

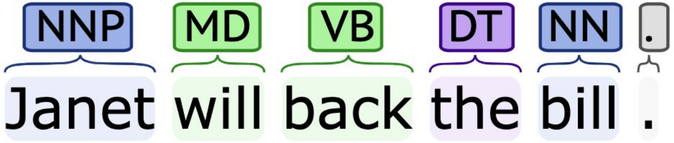
Part-of-Speech tagging

Sentence splitting » Tokenization » **Tagging & Lemmatization** » Parsing

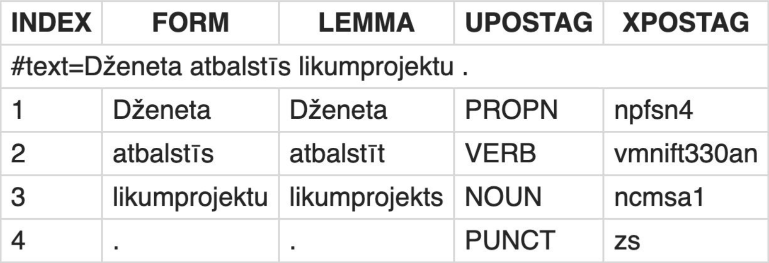
State-of-the-art POS taggers: above **95%** accuracy



https://web.stanford.edu/~jurafsky/slp3/



https://corenlp.run



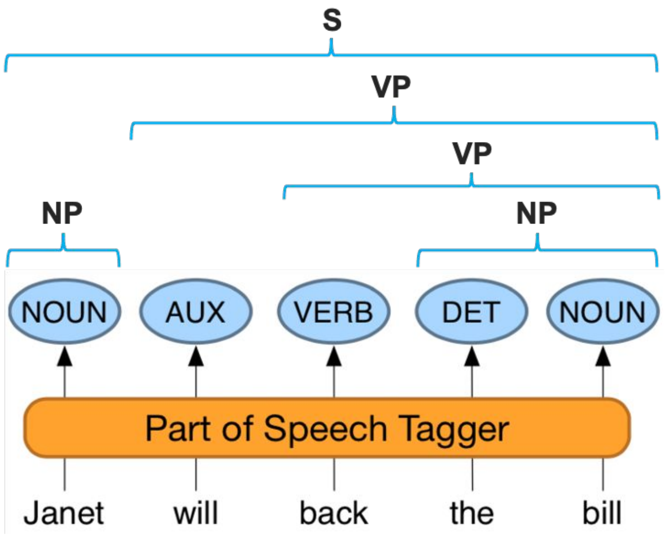
INDEX	FORM	LEMMA	UPOSTAG	XPOSTAG
#text=Dženeta atbalstīs likumprojektu .				
1	Dženeta	Dženeta	PROPN	npfsn4
2	atbalstīs	atbalstīt	VERB	vmnift330an
3	likumprojektu	likumprojekts	NOUN	ncmsa1
4	.	.	PUNCT	zs

https://nlp.ailab.lv

Syntactic parsing

Constituency (CFG/PSG) vs. **dependency** (UD) parsing

State-of-the-art parsers: above **90%** accuracy

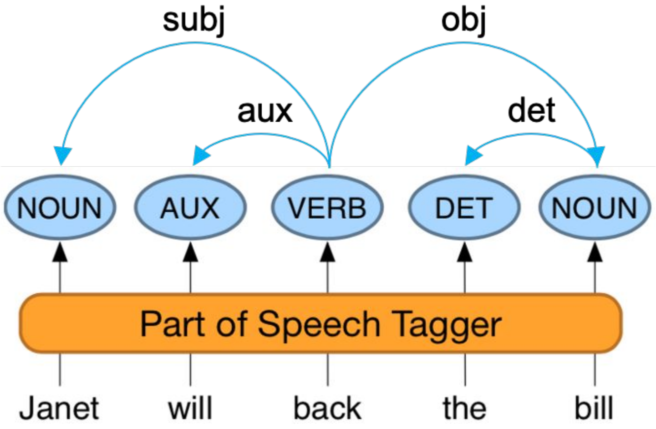


Chomsky (1956)

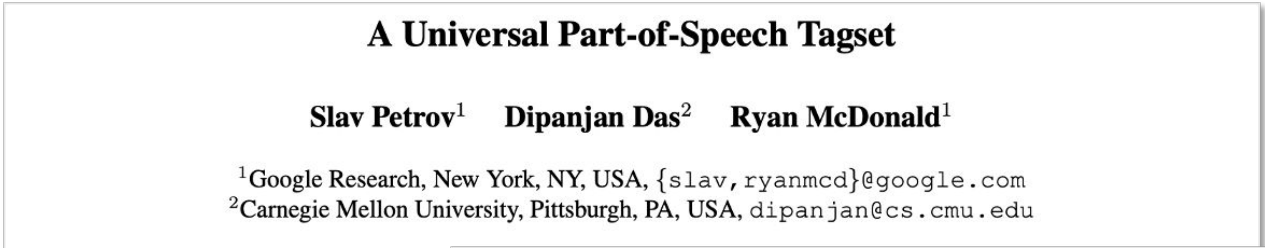
Production rules
e.g. `S → NP VP`

Tesnière (1959)

Syntactic relations
(functions)
(roles)



Universal Dependencies



A Universal Part-of-Speech Tagset

Slav Petrov[1] Dipanjan Das[2] Ryan McDonald[1]

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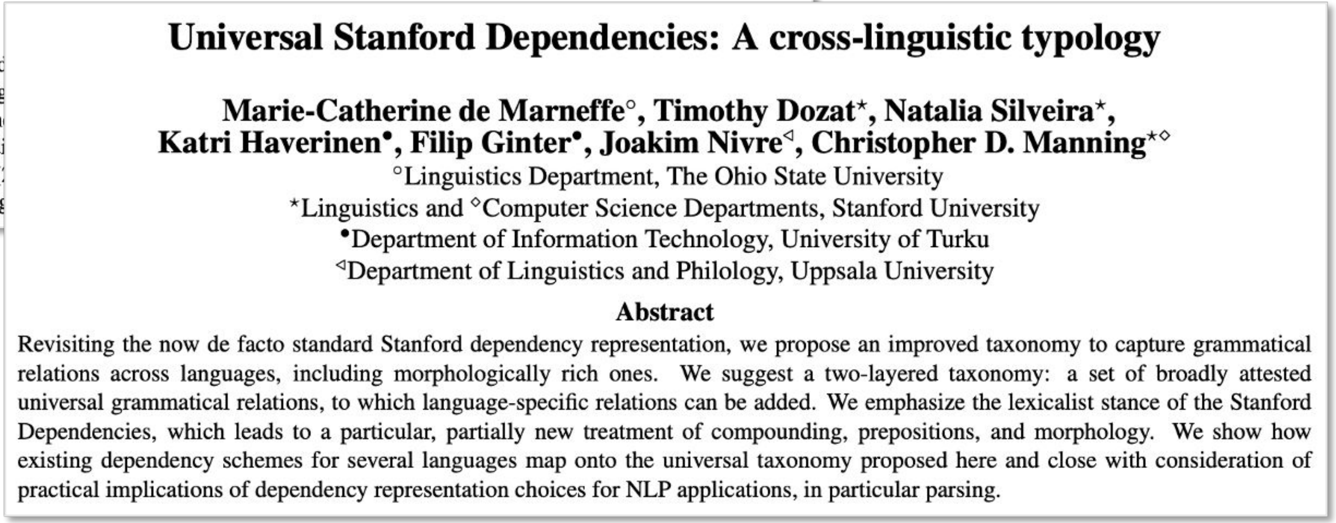
[2]Carnegie Mellon University, Pittsburgh, PA, USA, dipanjan@cs.cmu.edu

To facilitate future research in unsupervised ind
consists of twelve universal part-of-speech categ
to this universal set. As a result, when combin
consisting of common parts-of-speech for 22 di
compare tagging accuracies across languages, (
part-of-speech tags, and (3) use the universal tag

LREC 2012
Language and treebank specific POS tagsets ↣ 12 universal tags (currently: **17**)



Universal Stanford Dependencies: A cross-linguistic typology

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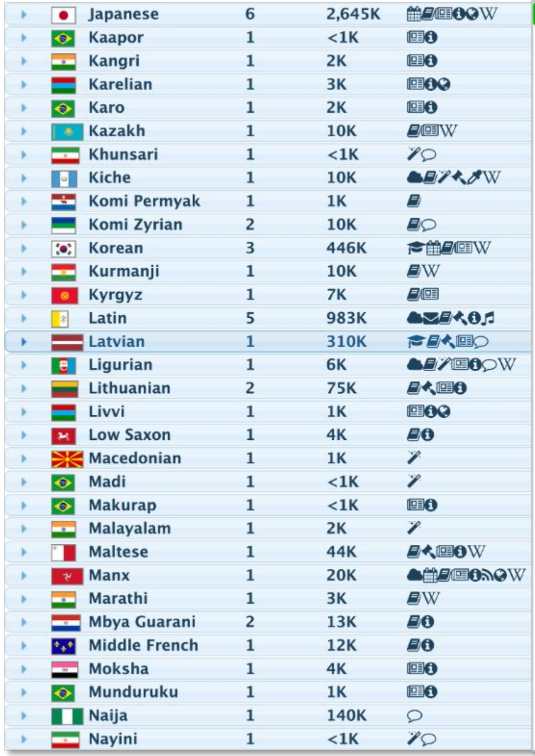
Abstract

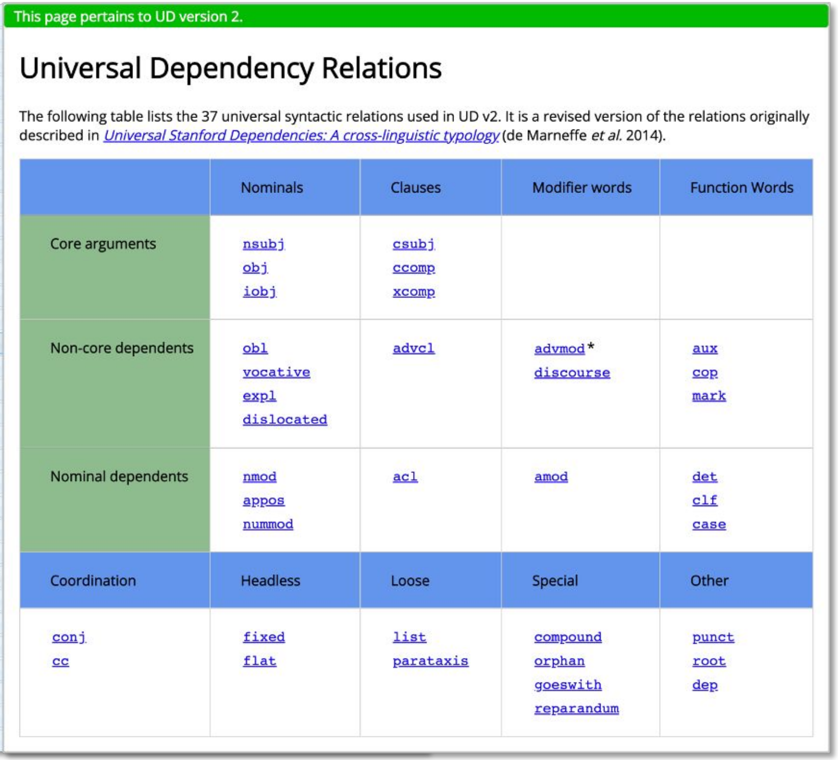
Revisiting the now de facto standard Stanford dependency representation, we propose an improved taxonomy to capture grammatical relations across languages, including morphologically rich ones. We suggest a two-layered taxonomy: a set of broadly attested universal grammatical relations, to which language-specific relations can be added. We emphasize the lexicalist stance of the Stanford Dependencies, which leads to a particular, partially new treatment of compounding, prepositions, and morphology. We show how existing dependency schemes for several languages map onto the universal taxonomy proposed here and close with consideration of practical implications of dependency representation choices for NLP applications, in particular parsing.

LREC 2014
A set of broadly attested universal syntactic relations (currently: **37**)

Universal Dependencies



Japanese	6	2,645K
Kaapor	1	<1K
Kangri	1	2K
Karelian	1	3K
Karo	1	2K
Kazakh	1	10K
Khunsari	1	<1K
Kiche	1	10K
Komi Permyak	1	1K
Komi Zyrian	2	10K
Korean	3	446K
Kurmanji	1	10K
Kyrgyz	1	7K
Latin	5	983K
Latvian	1	310K
Ligurian	1	6K
Lithuanian	2	75K
Livvi	1	1K
Low Saxon	1	4K
Macedonian	1	1K
Madi	1	<1K
Makurap	1	<1K
Malayalam	1	2K
Maltese	1	44K
Manx	1	20K
Marathi	1	3K
Mbya Guarani	2	13K
Middle French	1	12K
Moksha	1	4K
Munduruku	1	1K
Naija	1	140K
Nayini	1	<1K



This page pertains to UD version 2.

Universal Dependency Relations

The following table lists the 37 universal syntactic relations used in UD v2. It is a revised version of the relations originally described in *Universal Stanford Dependencies: A cross-linguistic typology* (de Marneffe *et al.* 2014).

	Nominals	Clauses	Modifier words	Function Words
Core arguments	nsubj obj iobj	csubj ccomp xcomp		
Non-core dependents	obl vocative expl dislocated	advcl	advmod* discourse	aux cop mark
Nominal dependents	nmod appos nummod	acl	amod	det clf case
Coordination	**Headless**	**Loose**	**Special**	**Other**
conj cc	fixed flat	list parataxis	compound orphan goeswith reparandum	punct root dep

~150 languages
~250 treebanks
500+ contributors

Released twice a year (via CLARIN)

Used for:

- linguistic research
- training of language models

https://universaldependencies.org

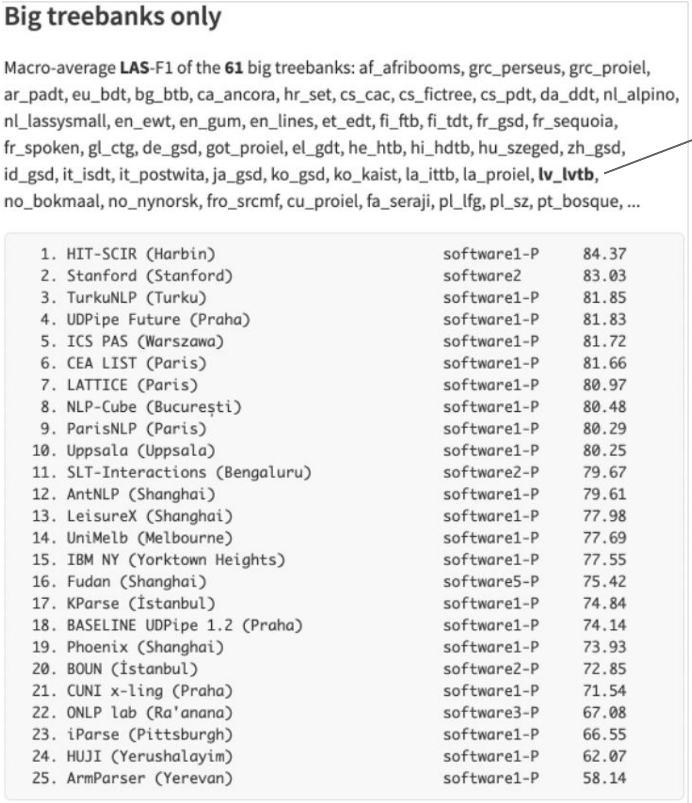
https://universaldependencies.org/u/pos/
https://universaldependencies.org/u/dep/

The CoNLL-U format (i.e., the data fields)

```
1 Workers worker NOUN  Number=Plur                      2 nsubj
2 dumped  dump   VERB  Mood=Ind|Tense=Past|VerbForm=Fin 0 root
3 sacks   sack   NOUN  Number=Plur                      2 dobj
4 into    into   ADP   _                                6 case
5 a       a      DET   Definite=Ind|PronType=Art        6 det
6 bin     bin    NOUN  Number=Sing                      2 nmod
7 .       .      PUNCT _                                2 punct
```

https://universaldependencies.org/format.html

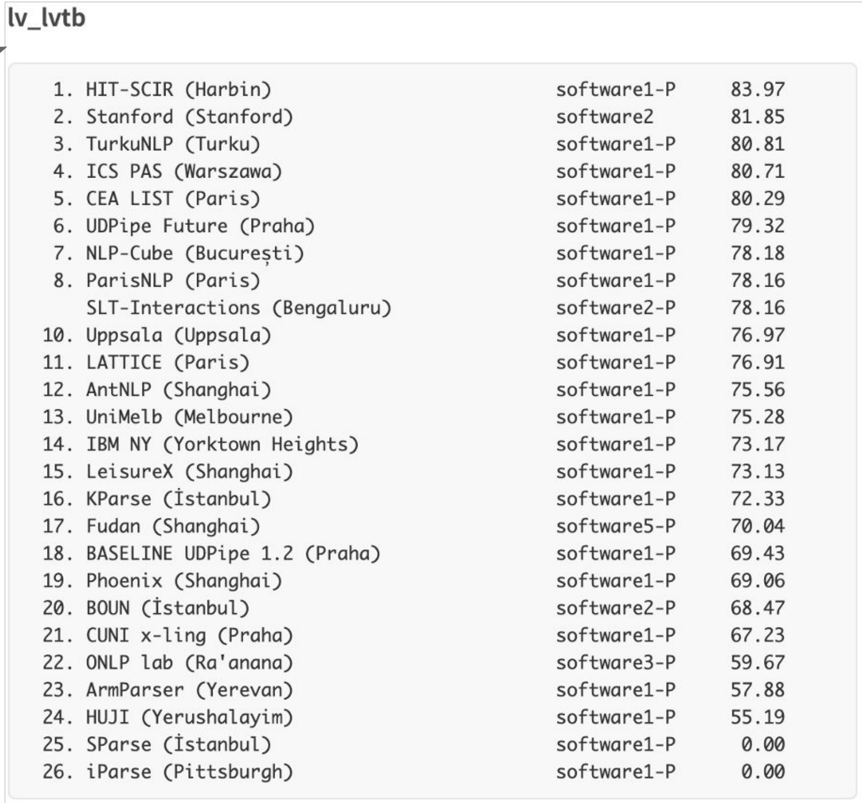
UD parsing: CoNLL 2018 Shared Task, etc.



Big treebanks only

Macro-average **LAS**-F1 of the **61** big treebanks: af_afribooms, grc_perseus, grc_proiel, ar_padt, eu_bdt, bg_btb, ca_ancora, hr_set, cs_cac, cs_fictree, cs_pdt, da_ddt, nl_alpino, nl_lassysmall, en_ewt, en_gum, en_lines, et_edt, fi_ftb, fi_tdt, fr_gsd, fr_sequoia, fr_spoken, gl_ctg, de_gsd, got_proiel, el_gdt, he_htb, hi_hdtb, hu_szeged, zh_gsd, id_gsd, it_isdt, it_postwita, ja_gsd, ko_gsd, ko_kaist, la_ittb, la_proiel, **lv_lvtb**, no_bokmaal, no_nynorsk, fro_srcmf, cu_proiel, fa_seraji, pl_lfg, pl_sz, pt_bosque, ...

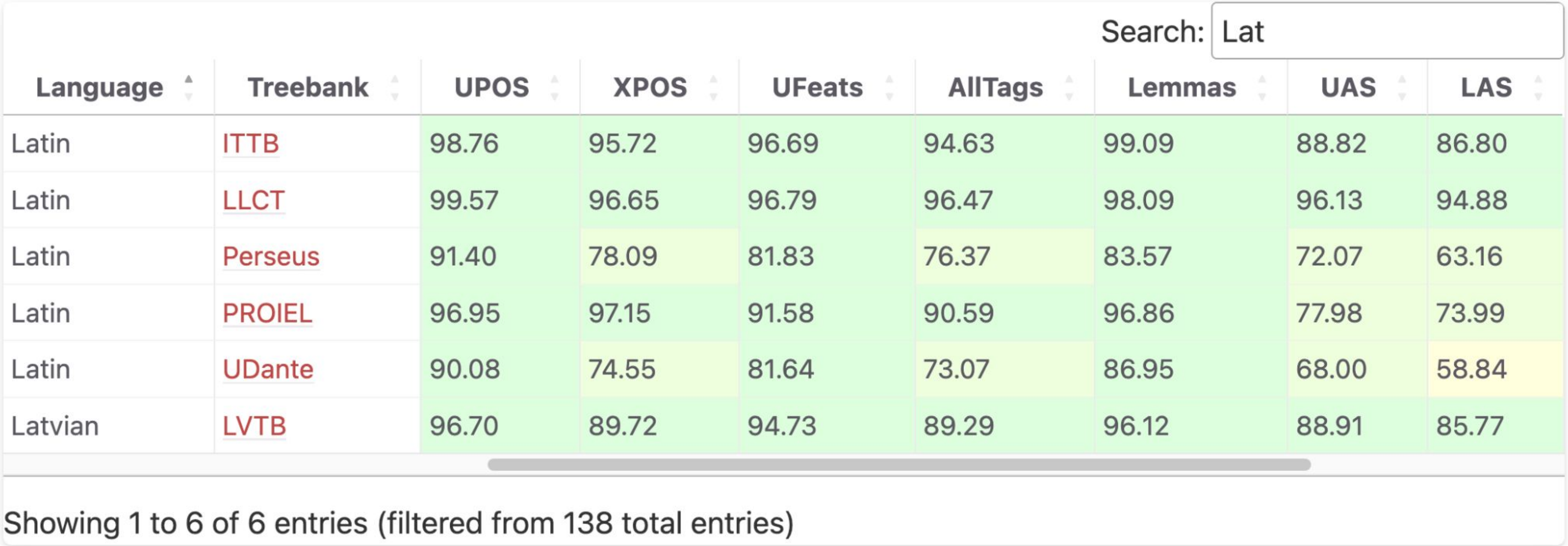
1.	HIT-SCIR (Harbin)	software1-P	84.37
2.	Stanford (Stanford)	software2	83.03
3.	TurkuNLP (Turku)	software1-P	81.85
4.	UDPipe Future (Praha)	software1-P	81.83
5.	ICS PAS (Warszawa)	software1-P	81.72
6.	CEA LIST (Paris)	software1-P	81.66
7.	LATTICE (Paris)	software1-P	80.97
8.	NLP-Cube (București)	software1-P	80.48
9.	ParisNLP (Paris)	software1-P	80.29
10.	Uppsala (Uppsala)	software1-P	80.25
11.	SLT-Interactions (Bengaluru)	software2-P	79.67
12.	AntNLP (Shanghai)	software1-P	79.61
13.	LeisureX (Shanghai)	software1-P	77.98
14.	UniMelb (Melbourne)	software1-P	77.69
15.	IBM NY (Yorktown Heights)	software1-P	77.55
16.	Fudan (Shanghai)	software5-P	75.42
17.	KParse (İstanbul)	software1-P	74.84
18.	BASELINE UDPipe 1.2 (Praha)	software1-P	74.14
19.	Phoenix (Shanghai)	software1-P	73.93
20.	BOUN (İstanbul)	software2-P	72.85
21.	CUNI x-ling (Praha)	software1-P	71.54
22.	ONLP lab (Ra'anana)	software3-P	67.08
23.	iParse (Pittsburgh)	software1-P	66.55
24.	HUJI (Yerushalayim)	software1-P	62.07
25.	ArmParser (Yerevan)	software1-P	58.14



lv_lvtb

1.	HIT-SCIR (Harbin)	software1-P	83.97
2.	Stanford (Stanford)	software2	81.85
3.	TurkuNLP (Turku)	software1-P	80.81
4.	ICS PAS (Warszawa)	software1-P	80.71
5.	CEA LIST (Paris)	software1-P	80.29
6.	UDPipe Future (Praha)	software1-P	79.32
7.	NLP-Cube (București)	software1-P	78.18
8.	ParisNLP (Paris)	software1-P	78.16
	SLT-Interactions (Bengaluru)	software2-P	78.16
10.	Uppsala (Uppsala)	software1-P	76.97
11.	LATTICE (Paris)	software1-P	76.91
12.	AntNLP (Shanghai)	software1-P	75.56
13.	UniMelb (Melbourne)	software1-P	75.28
14.	IBM NY (Yorktown Heights)	software1-P	73.17
15.	LeisureX (Shanghai)	software1-P	73.13
16.	KParse (İstanbul)	software1-P	72.33
17.	Fudan (Shanghai)	software5-P	70.04
18.	BASELINE UDPipe 1.2 (Praha)	software1-P	69.43
19.	Phoenix (Shanghai)	software1-P	69.06
20.	BOUN (İstanbul)	software2-P	68.47
21.	CUNI x-ling (Praha)	software1-P	67.23
22.	ONLP lab (Ra'anana)	software3-P	59.67
23.	ArmParser (Yerevan)	software1-P	57.88
24.	HUJI (Yerushalayim)	software1-P	55.19
25.	SParse (İstanbul)	software1-P	0.00
26.	iParse (Pittsburgh)	software1-P	0.00

UD parsing: Stanza’s pretrained UD models



Search: Lat

Language	Treebank	UPOS	XPOS	UFeats	AllTags	Lemmas	UAS	LAS
Latin	ITTB	98.76	95.72	96.69	94.63	99.09	88.82	86.80
Latin	LLCT	99.57	96.65	96.79	96.47	98.09	96.13	94.88
Latin	Perseus	91.40	78.09	81.83	76.37	83.57	72.07	63.16
Latin	PROIEL	96.95	97.15	91.58	90.59	96.86	77.98	73.99
Latin	UDante	90.08	74.55	81.64	73.07	86.95	68.00	58.84
Latvian	LVTB	96.70	89.72	94.73	89.29	96.12	88.91	85.77

Showing 1 to 6 of 6 entries (filtered from 138 total entries)

https://stanfordnlp.github.io/stanza/performance.html

UD parsers: Stanza, UDpipe, spaCy, LV-PIPE, etc.

Stanza: a Python package, supports **70**+ languages (out of the box)

- https://stanfordnlp.github.io/stanza/models.html
- **easy to use**

UDpipe: a REST web-service, supports **70**+ languages

- https://ufal.mff.cuni.cz/udpipe/2/models

spaCy: a Python package, supports **25**+ languages (out of the box)

- https://spacy.io/models
- industry-strength

LV-PIPE: a REST web-service, supports only Latvian

- https://nlp.ailab.lv ↠ https://korpuss.lv, https://proza.lnb.lv, etc.
- ~**90%** LAS score (based on LV-BERT, 2020-2022)

The Task

Create a teeny-tiny UD annotated text corpus of **~10** currently trending news articles

- In a language of your choice
- Together, you will create a multilingual corpus

Get a list of such articles (links)

- Use **Europe Media Monitor** as a source
- Extract the links form an **RSS** feed, using `feedparser`

Extract text from the webpages, using `bs4`

Parse the texts, using `stanza`, and create a **VERT** file

We will concatenate your VERT files into a single file

- It will be uploaded to a **NoSketch Engine** instance for running **CQL** queries over this dataset

https://github.com/LUMII-AILab/NLP_Course/blob/main/notebooks/**BSSDH2024.ipynb**

Assignment & Grading

Submission: your final version of the `BSSDH2024.ipynb` template

- Improvements, extensions, comments, runtime output, etc.

Criteria:

- Grade **7–8**: you have managed to do basic plain-text extraction (which may still be noisy) and have produced a valid VERT file with basic UD annotations (`lemma`, `pos`, `dep`)
- Grade **8–9**: the extracted plain-text is rather clean and rather well segmented, the VERT file contains extra UD annotations (`dep_head_lemma`, `dep_head_pos`, `dep_head_dep`)
- Grade **10**: surprise us 😉
  - e.g., scale your corpus from 10 to 100 articles, or add named entity recognition, or use another framework, etc.
- +/**-1** point for a well/poorly commented and documented notebook with some/no conclusions