DistaLs: A Comprehensive Collection of Language Distance Measures

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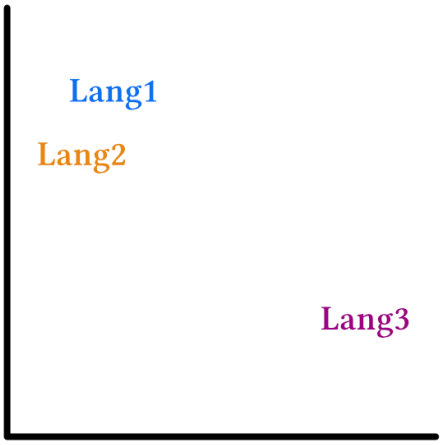
Typology



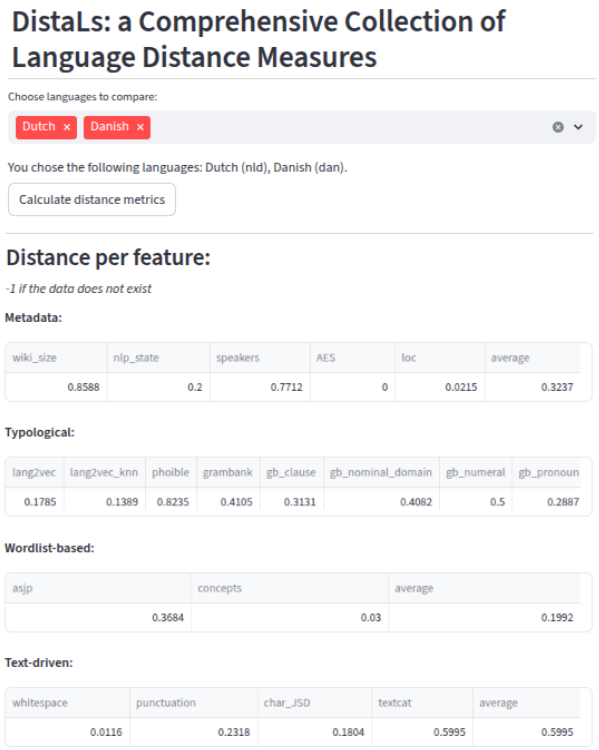
Lexical

Languages can differ among many dimensions!

Why do we need language distances?

- It is super interesting
- Pick good transfer languages in cross-lingual NLP
- Measure correlation between performance and language distance
- Ensure a diverse language sample in experiments

Online interface



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Choose languages to compare:

Dutch × Danish ×

You chose the following languages: Dutch (nld), Danish (dan).

Calculate distance metrics

Distance per feature:

-1 if the data does not exist

Metadata:

wiki_size	nlp_state	speakers	AES	loc	average
0.8588	0.2	0.7712	0	0.0215	0.3237

Typological:

lang2vec	lang2vec_knn	phoible	grambank	gb_clause	gb_nominal_domain	gb_numeral	gb_pronoun
0.1785	0.1389	0.8235	0.4105	0.3131	0.4082	0.5	0.2887

Wordlist-based:

asjp	concepts	average
0.3684	0.03	0.1992

Text-driven:

whitespace	punctuation	char_JSD	textcat	average
0.0116	0.2318	0.1804	0.5995	0.5995

Python

```
>>> from distals import distals
>>> model = distals.Distals()
>>> model.get_dists('nld', 'cmn')
{'metadata': {'wiki_size': 0.99378,
              'nlp_state': 0.2,
              'speakers': 0.98131,
              'AES': 0.0,
              'loc': 0.39121,
              'average': 0.39377},
 'typology': {'lang2vec': 0.31654,
              'lang2vec_knn': 0.33795,
              'phoible': 0.82278,
              'grambank': 0.58478,
              'gb_clause': 0.55470,
              'gb_nominal_domain': 0.59761,
              'gb_numeral': 0.0,
              'gb_pronoun': 0.64550,
              'gb_verbal_domain': 0.60302,
              'glot_tree': 1.0,
              'scripts': 0.66667,
              'average': 0.80252},
 'wordlists': {'asjp': 0.49636,
               'concepts': 0.08,
               'average': 0.28818}
 'textbased': {'whitespace': 0.21244,
               'punctuation': 0.67855,
               'char_JSD': 0.54401,
               'textcat': 0.87235,
               'average': 0.87235}
}
```

CLI

```
$ distals —langs fry dan
loading from: ./distals—db.pickle.gz
7856 languages loaded
```

```
Information for fry
wiki_size: 57,027
nlp_state: 1. The Scraping—Bys
speakers: 740,000
AES: 5. not endangered
loc: (5.86091, 53.143)
lang2vec: [1.0, 1.0, 0.0, ...]
lang2vec_knn: [1.0, 1.0, 0.0, ...]
phoible: ['0061', '0061+0069',
       '0061+0075', ...]
grambank: {'GB020': 1, 'GB021': 1, '
       GB022': 1, ...}
glot_tree: ['Western Frisian [west2354][
       fry]!', 'Westlauwers Terschelling
       Frisian [west2902]', 'Modern West
       Frisian [mode1264]', ...]
scripts: {'latn'}
asjp: [['1', 'ik'], ['2', 'do, yo'],
       ['3', 'vEi'], ...]
whitespace: 0.160835
punctuation: 0.031726
char_JSD: {' ': 0.1608, 'e': 0.1195, 'n
       ': 0.0754, ...}
textcat: [' ', 'e', 'n', ...]
```

```
Distances between fry and dan (—1 if
       feature not available)
METADATA
wiki_size: 0.8154
nlp_state: 0.4000
speakers: 0.8657
AES: 0.0000
loc: 0.0149
average: 0.5203

TYPOLOGY
lang2vec: 0.1598
lang2vec_knn: 0.1204
phoible: 0.8148
grambank: 0.3841
gb_clause: 0.3742
gb_nominal_domain: 0.3482
gb_numeral: 0.5000
gb_pronoun: 0.0000
gb_verbal_domain: 0.4644
glot_tree: 0.5325
scripts: 0.0000
average: 0.5995

WORDLISTS
asjp: 0.3397
concepts: 0.0400
average: 0.1898

TEXTBASED
whitespace: 0.0282
punctuation: 0.1012
char_JSD: 0.1979
textcat: 0.5859
average: 0.3919
```

How to use: `https://distals.streamlit.app/` `pip3 install distals` `https://bitbucket.org/robvanderg/distals`