Modern Methods for Exploring Text Data

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RTI INTERNATIONAL

#solo10 Word Cloud

Word cloud of tweets from Science Online 2010, generated using Wordle (http://wordle.net).
https://www.flickr.com/photos/sjcockell/4963334783

How is it tokenizing?

What tokens is it excluding?

Can I differentiate nouns, verbs, and adjectives?

Can I combine tokens with the same root word in a meaningful way?

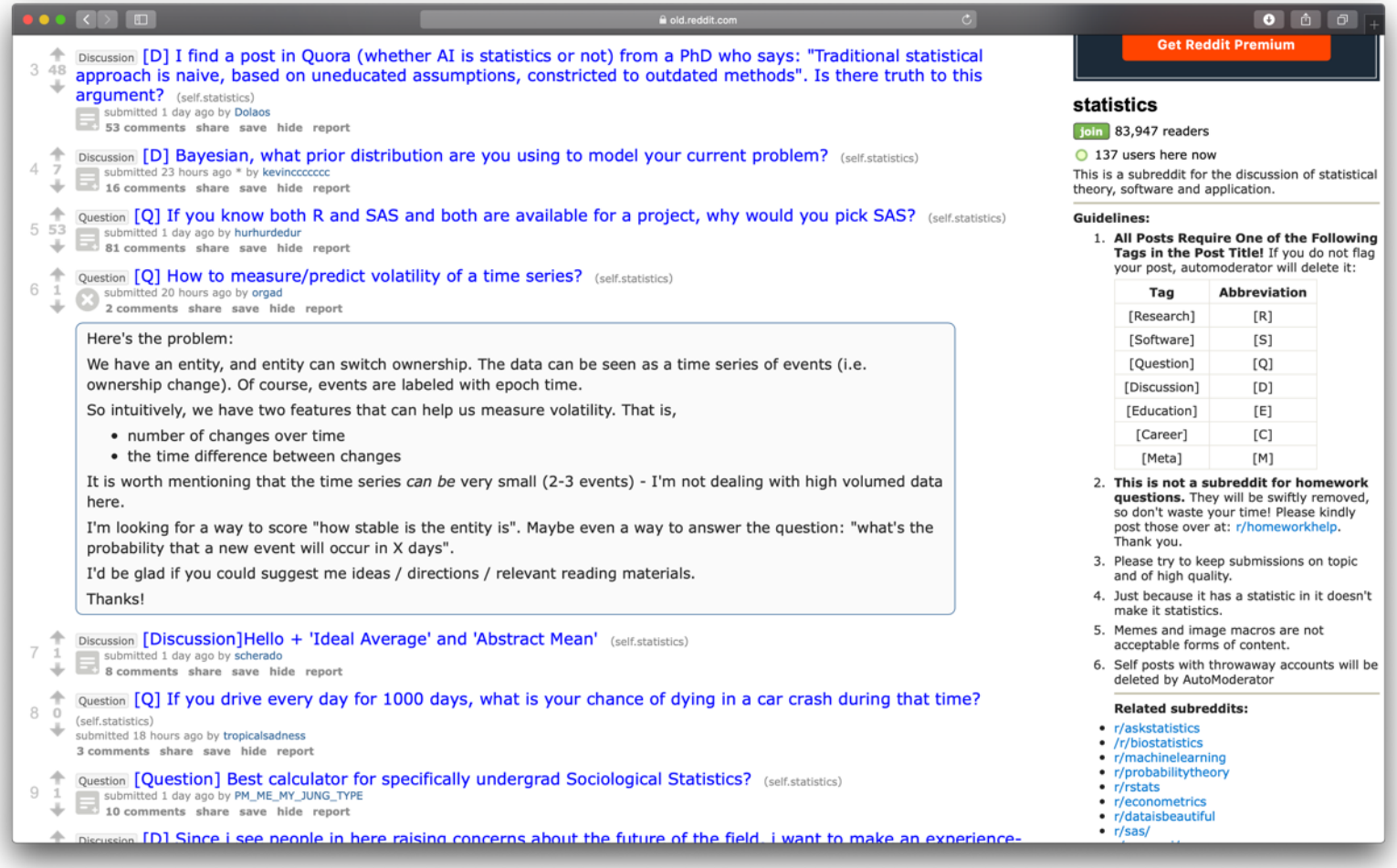
Which tokens are unique for this corpus?

Can I see a token used in context?

How will this scale to larger amounts of text?

Can I cluster words by their use?

Sample Dataset



Post titles and text from the ***r/statistics*** and ***r/askstatistics*** communities on reddit from December 2015 – March 2019.

30,693 total posts.

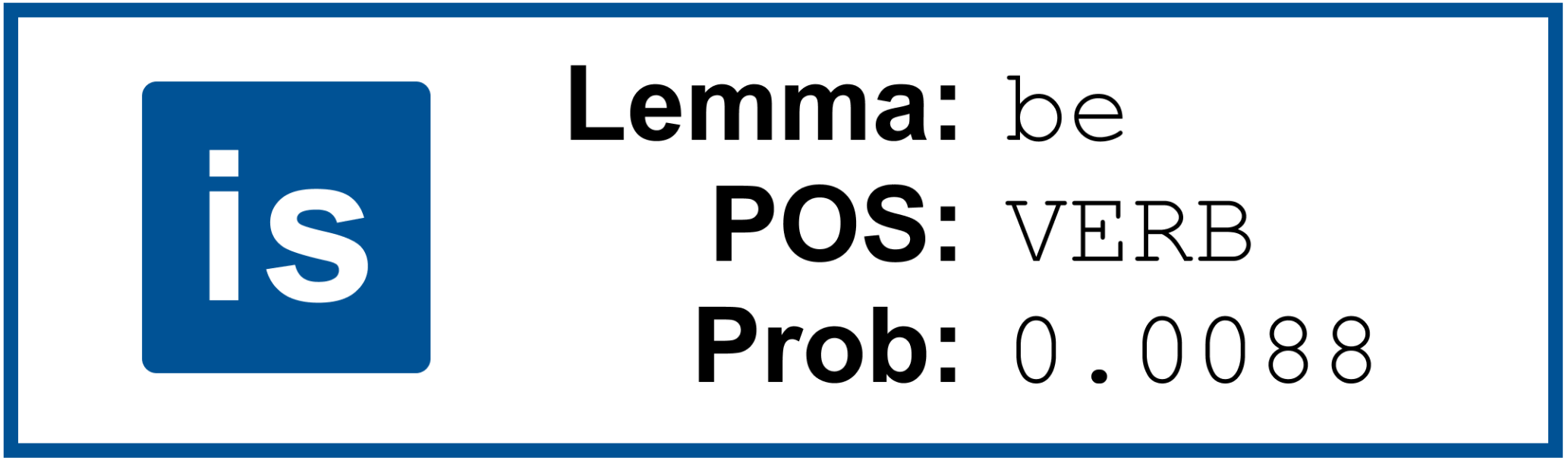
61% from r/statistics
39% from r/askstatistics

TOKENIZATION

"Can anyone tell me what a p-value is?"

TOKENIZATION

Token Attributes



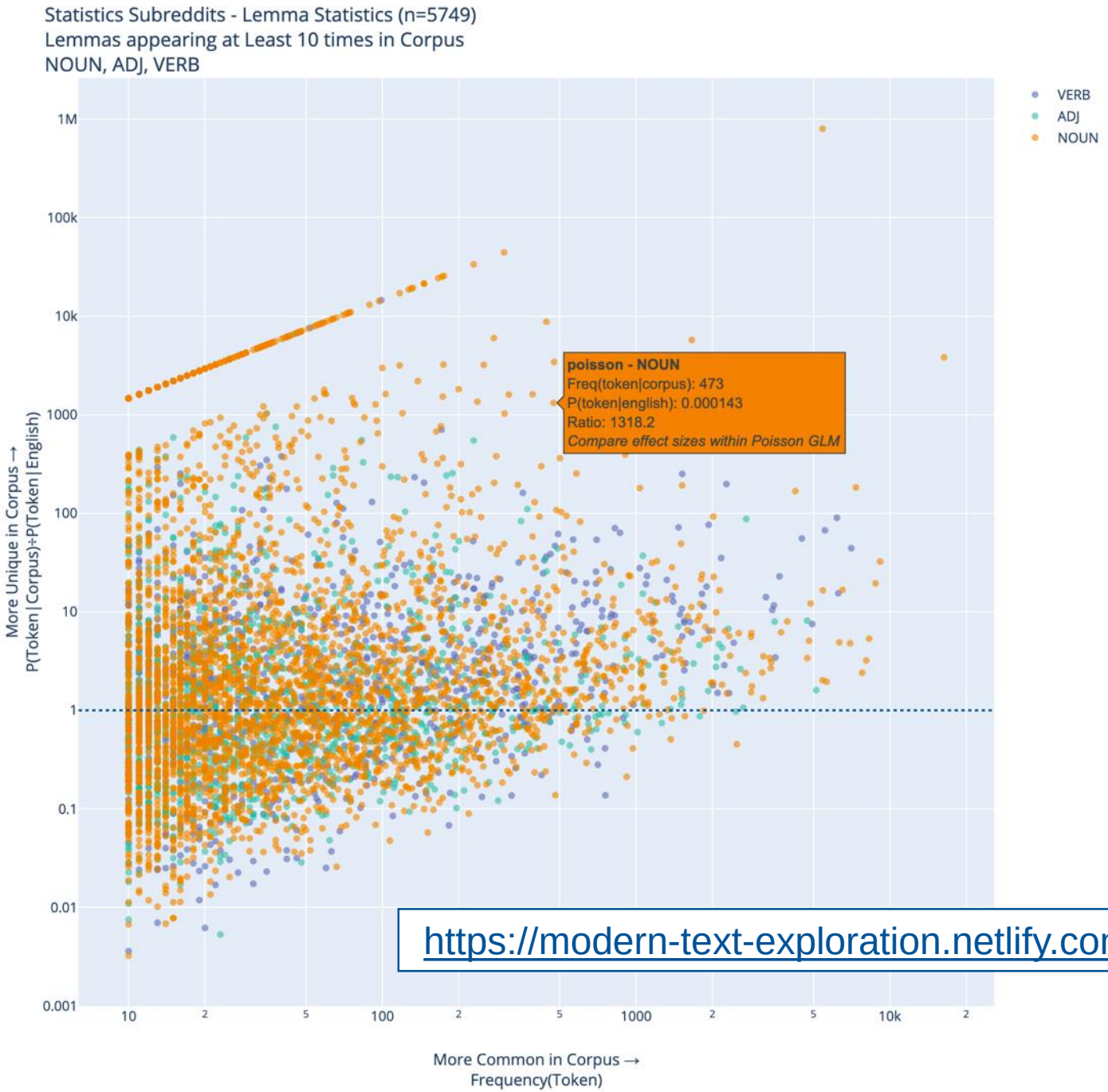
Can anyone tell me what a p-value **is** ?

Data Processing & Lemma Statistics

sample

Lemma	POS	Stopword	Corpus Count	Corpus Prob	English Prob	Corpus/English Ratio
manual	NOUN	FALSE	**29**	0.000009	0.000023	**0.388**
injure	VERB	FALSE	**13**	0.000004	0.000001	**7.033**
methods	NOUN	FALSE	**58**	0.000018	0.000277	**0.063**
irregular	ADJ	FALSE	**12**	0.000004	0.000015	**0.243**
forests	NOUN	FALSE	**10**	0.000003	0.000016	**0.193**

n lemmas = 74,358

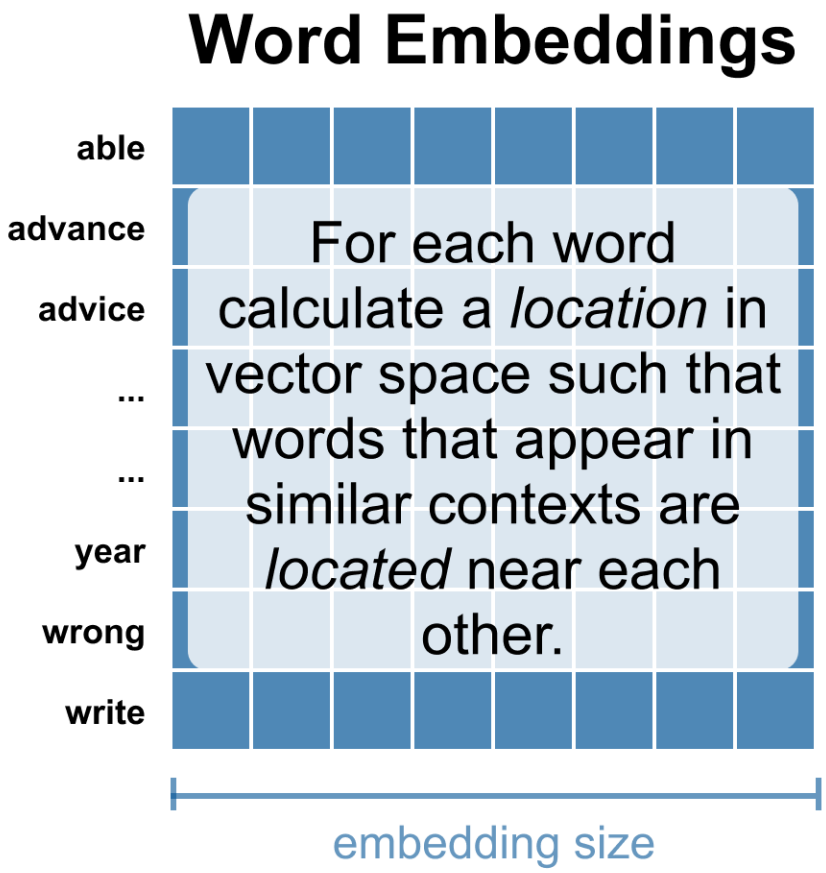


Interactive Visualization 1:

Exploring lemma counts and uniqueness by parts of speech

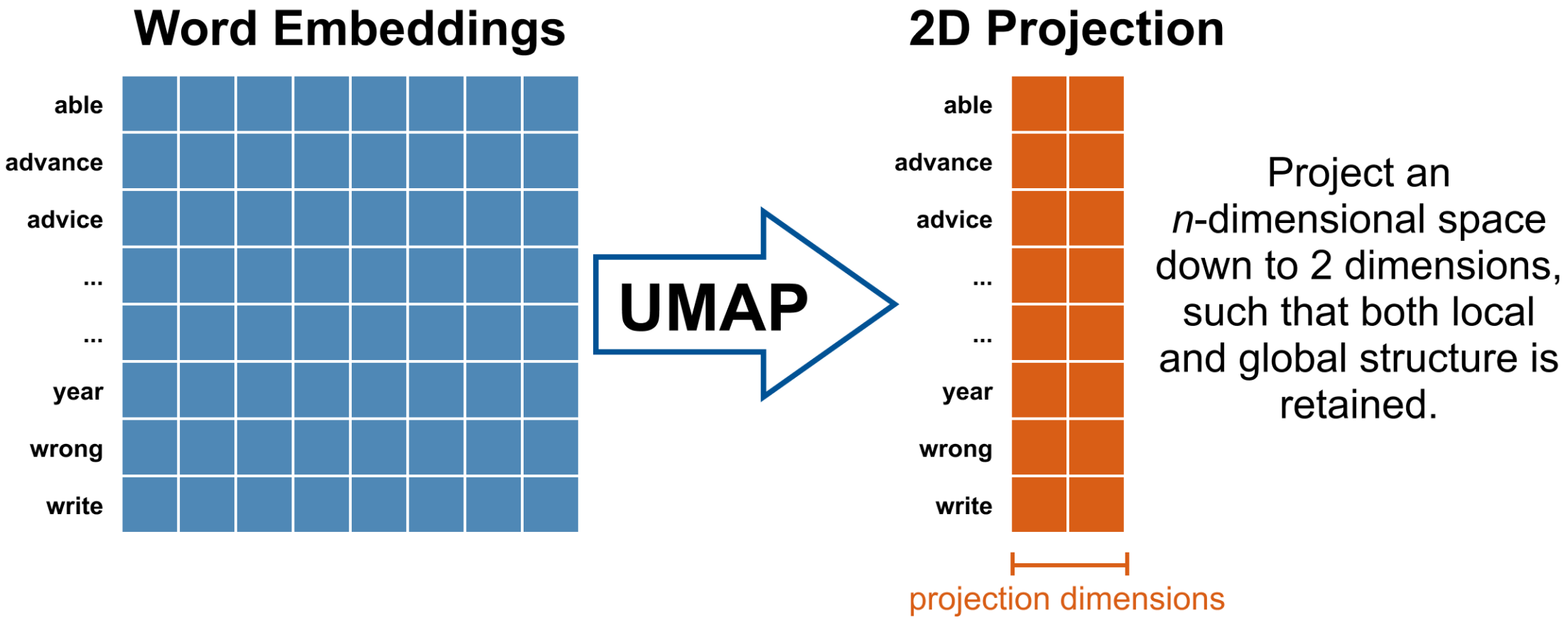
https://modern-text-exploration.netlify.com/token-statistics.html

Word Embeddings



more on word2vec: https://jalammar.github.io/illustrated-word2vec/

Word Embeddings & Dimension Reduction

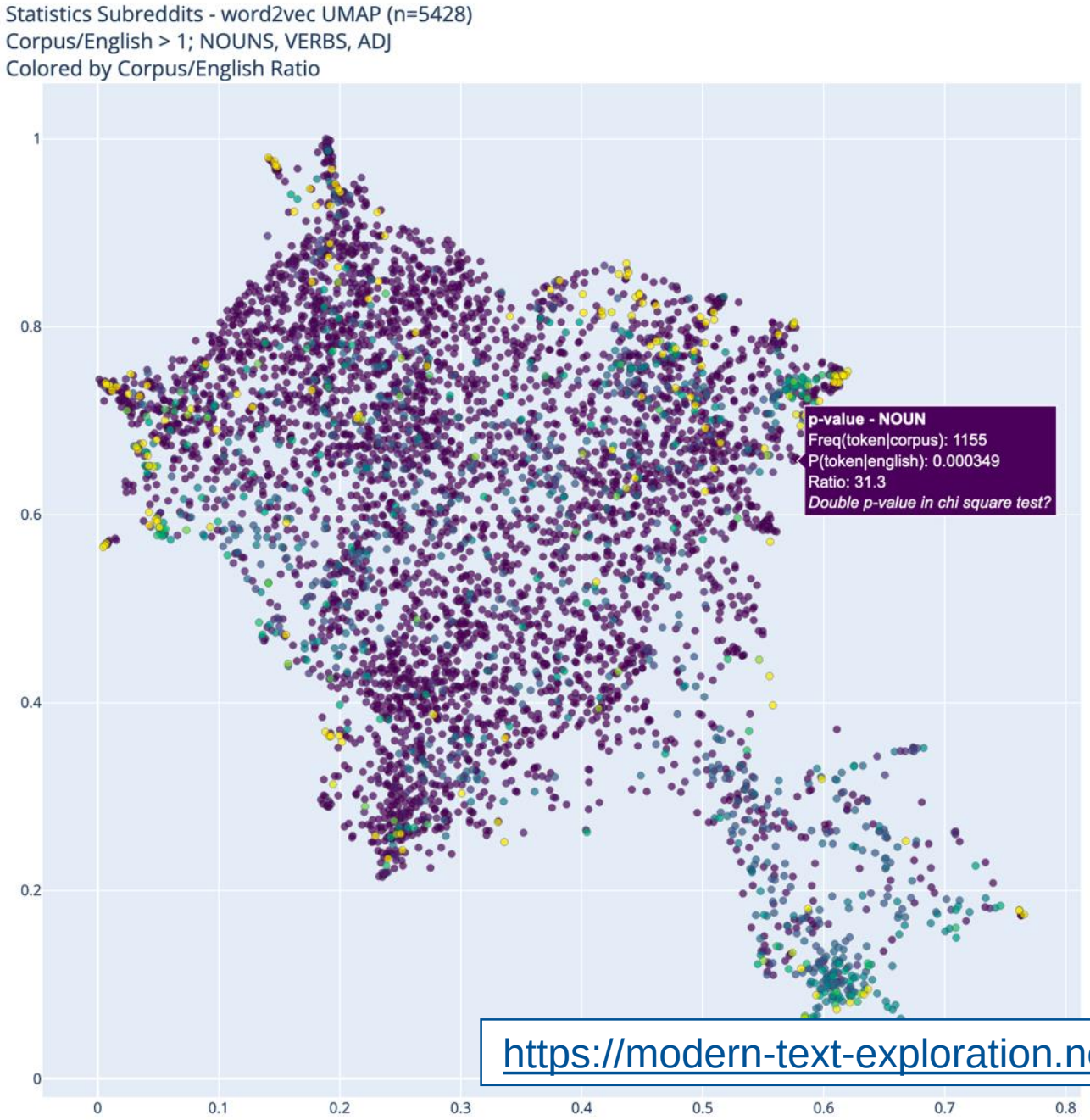


Project an *n*-dimensional space down to 2 dimensions, such that both local and global structure is retained.

Merge Projection Back to Dataset

sample

Lemma	POS	…	Component 1	Component 2
manual	NOUN	…	**0.934**	**0.734**
injure	VERB	…	**0.723**	**0.222**
methods	NOUN	…	**0.147**	**0.063**
irregular	ADJ	…	**0.237**	**0.243**
forests	NOUN	…	**0.717**	**0.182**



Interactive Visualization 2:

Exploring projections of word embeddings from word2vec

https://modern-text-exploration.netlify.com/w2v-umap.html

modern-text-exploration.netlify.com

Slides

Notebook with code

Visualizations 1 & 2

Resources