NLP Scholar: An Interactive Visual Explorer for Natural Language Processing Literature



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Ten-Second History of NLP

• Turing Test proposed

- Engine framework in the the the start for th
- Formation of the Association for Computational Linguistics (ACL)
 1962
 - originally named the Association for Machine Translation and Computational Linguistics (AMTCL)
- First ACL conference
- ACL, ELRA, and AFNLP publish peer-reviewed papers
 - journal articles and conference proceedings (long, short, demo, etc.)
- Broad interdisciplinary field
 - researchers from Computer Science, Linguistics, Information Science, Psychology, Social Sciences, Humanities, and more
 - thousands of papers published every year

1965

1950



Today

2

Need for a Search Engine Dedicated to NLP Literature

Desirable features:

- easy to use
- visual
- interactive
- captures impact of papers





Metrics of Research Impact (on subsequent scholarly work)

- Often derived from citations
 - number of citations, average citations, h-index, relative citation ratio, and impact factor (Bornmann and Daniel, 2009)
- However, citations do not always reflect quality or importance Impacted by:
 - systematic biases
 - atypical contributions
 - popularity of area
 - unethical practices (e.g. egregious self citations)

Nonetheless, given the lack of other easily applicable and effective metrics, citation metrics used as an imperfect but useful window into research impact

• often a factor in funding research and hiring scientists



The NLP Scholar Project

Data: extracted and aligned information from

- the ACL Anthology (AA)
- Google Scholar (GS)

to create a dataset of tens of thousands of NLP papers and their citations

NLP Scholar: A Dataset for Examining the State of NLP Research. LREC 2020.

Analyzing NLP Literature:

Examining Citations of Natural Language Processing Literature. ACL 2020. Gender Gap in Natural Language Processing Research: Disparities in Authorship and Citations. ACL 2020.

Practical Tool:

NLP Scholar: An interactive visual explorer for this unified AA-GS dataset

to find related work



Uses of NLP Scholar

- search for related work in various areas within NLP
- identify the highly cited articles on an interactive timeline
- identify past papers published in a venue of interest (such as ACL or COLING)
 - E.g., papers from ten years back published at ACL that have substantial citations
- examine changes in number of articles and number of citations in an area over time
- identify citation impact of different types of papers
 - e.g., short papers, shared task papers, demo papers, etc.

Other practical applications of the NLP Scholar dataset

Web browser extensions that allow:

- users of GS to look up the aligned AA information
 - the full ACL BibTeX, poster, slides, access to proceedings from the same venue, etc.
- access from AA to the GS information of the aligned paper
 - number of citations, lists of papers citing the paper, etc.



- A1: #papers
 - 44,895
- A2: #papers by year
 - substantial numbers since the 2000s
 - higher in alternate years (biennial conferences such as LREC, COLING
- B1: # citations
 - ~1.2 million citations (as of June 2019)
- B2: # citations by year
 - 2000s are the most notable





C. Papers

Row	Paper-Id	Paper-Title	Author(s)	Year	Url	
1	P02-1040	Bleu: a Method for Automatic Evaluation of Machine Translation	Papineni, Kishore and Roukos, S	2002	htt.	9,098
2	W02-1011	Thumbs up? Sentiment Classification using Machine Learning Techniques	Pang, Bo and Lee, Lillian and Vai	2002	htt.,	8,187
з	D14-1162	Glove: Global Vectors for Word Representation	Pennington, Jeffrey and Socher	2014	htt	7,965
4	J93-2004	Building a Large Annotated Corpus of English: The Penn Treebank	Marcus, Mitch and Santorini, Be	1993	htt	7,527
5	J91-4003	The Generative Lexicon	Pustejovsky, James	1991	htt	6,593
6	P02-1053	Thumbs Up or Thumbs Down? Semantic Orientation Applied to Unsuper	Turney, Peter	2002	htt	5,642
7	D14-1179	Learning Phrase Representations using RNN Encoder-Decoder for Stati	Cho, Kyunghyun and van Merrie	2014	htt	5,344
8	J93-2003	The Mathematics of Statistical Machine Translation: Parameter Estima.,	Brown, Peter F. and Della Pietra	1993	htt	5,047
9	J90-1003	Word Association Norms, Mutual Information, and Lexicography	Church, Kenneth and Hanks, Pat	1990	htt	4,845
10	P07-2045	Moses: Open Source Toolkit for Statistical Machine Translation	Koehn, Philipp and Hoang, Hieu	2007	htt.	4,581

OK 5K 10K

#citations

D. Authors

Row	Author-name	
1	Manning, Christoph	54,58
2	Koehn, Philipp	19,412
3	Och, Franz Josef	18,620
4	Socher, Richard	17,506
5	Lee, Lillian	17,458
6	Jurafsky, Dan	16,405
7	Hovy, Eduard	16,292
8	Klein, Dan	15,881
9	Ney, Hermann	15,097
10	Dyer, Chris	14,745

E. Search by year of publication, title term (unigram, bigram), or author name

1965	0			D.	2019
Unigram		Bigram	Author Name		

OK 20K 40K 60K 80K #citations



B2: # citations by year

- ~1.2 million citations (as of June 2019)
- colored segments correspond to each of the papers
- the height of a segment is proportional to the number of citations the paper has received





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- C: most cited papers
 - machine translation, sentiment analysis, word embeddings, syntax, semantics
- D: most cited authors
- E: search options





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1965	0			D	2019
1000	9				2013
Unigram		Bigram	Author Name		

#citations



Four Other Dashboards

Main dashboard (A to E) + sixth element (F) for focused search

- F1: venues and paper types
- F2: title unigrams
- F3: title bigrams
- F4: language mentions in the title



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1	P02-1040	Bleu: a Method for Automatic Evaluation of Machine Translation	Papineni, Kishore and Roukos, S.	2002	htt.	9,098
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\$	P03-1054	Accurate Unlexicalized Parsing	Klein, Dan and Manning, Christo	2003	htt.	3,195
5	P04-1035	A Sentimental Education: Sentiment Analysis Using Subjectivity Summa	Pang, Bo and Lee, Lillian	2004	htt.	3,109
5	P03-1021	Minimum Error Rate Training in Statistical Machine Translation	Och, Franz Josef	2003	htt.	3,023
7.	P05-1045	Incorporating Non-local Information into Information Extraction Syste	Finkel, Jenny Rose and Grenage.	2005	htt	2,765
3	P95-1026	UNSUPERVISED WORD SENSE DISAMBIGUATION RIVALING SUPERVISE.	Yarowsky, David	1995	htt.	2,480
9	P14-1062	A Convolutional Neural Network for Modelling Sentences	Kalchbrenner, Nal and Grefenst	2014	htt.	1,794

10 P10-1040 Word Representations: A Simple and General Method for Semi-Supervis.. Turian, Joseph and Ratinov, Lev.. 2010 htt., 📓 1.753

OK 5K 10K #citations

D. Authors

E. Search by year of publication, title term (unigram, bigram), or author name



Year of publication



F1. Venue and Paper Type





Treemap of Venues and Paper Types

F1. Venue and Paper Type

*SEM	CL	Demos	EMNLP	JEP/TALN/RECI	NAACL	ROCLING/IJCLCL	TACL	TINLAP
192	922	981	3,140	48	1,477	918	258	84
ACL	COLING	Doctoral Cons.	HLT	LREC	PACLIC	SEMEVAL	Tutorials	
4,830	3,863	10	74	5,763	1,210	1,347	211	
ANLP	CoNLL	EACL	IJCNLP	MUC	RANLP	Shared Task	Workshops	
300	571	1,057	794	146	501	283	15,389	

- Items are in alphabetic order
- Below each item is the number of papers
- Darker shades of green indicate higher numbers



Treemap of Common Title Unigrams

papers 750 4.162 F2. Title Unigrams classificatio data knowledge linguistic multilingual spoken analysis discourse extraction recognition speech statist study 1,994 1,250 901 813 1,211 1,748 775 1,168 1,364 900 1,674 1,047 873 annotation context dependency domain features machine language natural semantic 1,154 757 987 857 2,611 1,100 1,256 syntactic task text transl 888 1,716 2,337 approach detection english languages model corpora generation neural sense 1,532 987 976 1,238 1,197 780 1,840 1,609 793 system dialogue automatic entity learning models parsing sentence 2,191 corpus grammar unsupervised word 764 1,751 2,248 982 932 831 1,475 2,020 systems chinese disambiguat evaluation information lexical multi sentiment cross processing web 911 1,837 804 765 1,425 1,466 1,262 1,105 813 985

- Items are in alphabetic order
- Below each item is the number of papers
- Darker shades of green indicate higher numbers



Treemap of Common Title Bigrams

F3

3. Title Bigra	. Title Bigrams							#papers		200,150 C
2016task	coreference resolution	finite state	language models	named entity	question answering	semeval 2017	shared task	social media	speech recogn.	spoken dialog.
2017 task	cross lingual	information extraction	language processing	natural language	relation extraction	semeval 2018				
2018 task	dependency parsing	information retrieval	large scale	neural machine	role labeling	semi supervised	spoken language	9	word alignmt.	word embeds.
case study	dialogue	language	machine	neural network	semantic role	sense	statistica	al		
•	systems	generation	learning			disambiguation	machine		word segmentn.	
chinese word	entity recognition	language model	machine translation	neural networks	semeval 2016	sentiment analysis	translati system	on	word sense	e

- Items are in alphabetic order
- Below each item is the number of papers •
- Darker shades of green indicate higher numbers •



Treemap of Common Languages

F4.	Lar	ngu	lag	es
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4. Langua	ges									#pap	ers	5 D	1,837
afrikaans 10	bulgarian 48	czech 111	filipino 15	hebrew 47	interlingua 20	korean 231	mandarin 212	portuguese 162	slovak 7	slover 21	n sp 23	anis O	swahili 5
amharic 16	cantonese 19	danish 68	finnish 44	hindi 177	inuktitut 6	kurdish 7	mongolian 9	romanian 63	swedish		thai	turki	urdu
arabic 550	catalan 20	dutch 135	french 362	hungarian 56	irish 17	latin 32	norwegian 54	russian 120	146 tagalog 9	68		87	64
assamese 8	chinese 1,837	english 1,238	galician 7	icelandic 17	italian 141	malay 8	persian 60	sanskrit 25	tamil 24		uyghu 9	r	wels 6
basque 64	croatian 57	estonian 35	german 405	indonesian 35	japanese 711	malayalam 15	polish 98	serbian 20	telugu 20		vietna 51	mese	

- Items are in alphabetic order
- Below each item is the number of papers
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Main View

C. Papers

A1. #papers

40K

20K

OK

Row	Paper-Id	Paper-Title	Author(s)	Year	Url	
1	P02-1040	Bleu: a Method for Automatic Evaluation of Machine Translation	Papineni, Kishore and Roukos, S	2002	htt	9,098
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5	J91-4003	The Generative Lexicon	Pustejovsky, James	1991	htt	6,593
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10	P07-2045	Moses: Open Source Toolkit for Statistical Machine Translation	Koehn, Philipp and Hoang, Hieu	2007	htt	4,581

OK 5K 10K

#citations

D. Authors

Row Author-name Manning, Christoph. 54,587 Koehn, Philipp 19,412 Och, Franz Josef 18,620 Socher, Richard 17,506 Lee, Lillian 17,458 Jurafsky, Dan 16,405 Hovy, Eduard 16,292 Klein, Dan 15,881 9 Ney, Hermann 15,097 10 Dyer, Chris 14,745 OK 20K 40K 60K 80K

E. Search by year of publication, title term (unigram, bigram), or author name

Year of publication

1965	0			D	2019
Unigram		Bigram	Author Name		

OK 40K 60K 80K #citations

A2. #papers, by year of publication





After entering terms associated with sentiment analysis in the Search Box.

~		-		÷.	1	100
	۲	d	P	e	r	5

1500

1000

500

Row	Paper-Id	Paper-Title	Author(s)	Year	Url
1	W02-1011	Thumbs up? Sentiment Classification using Machine Learning Techniques	Pang, Bo and Lee, Lillian and Vai	2002	htt 8,187
Z	P02-1053	Thumbs Up or Thumbs Down? Semantic Orientation Applied to Unsuper	Turney, Peter	2002	htt 5,642
3	H05-1044	Recognizing Contextual Polarity in Phrase-Level Sentiment Analysis	Wilson, Theresa and Wiebe, Jan	2005	htt 3,487
4	P04-1035	A Sentimental Education: Sentiment Analysis Using Subjectivity Summa	Pang, Bo and Lee, Lillian	2004	htt 🔜 3,109
5	D13-1170	Recursive Deep Models for Semantic Compositionality Over a Sentimen	Socher, Richard and Perelygin,	2013	htt 🗾 2,798
6	L10-1-531	SentiWordNet 3.0: An Enhanced Lexical Resource for Sentiment Analysi.	Baccianella, Stefano and Esuli,	2010	htt 📰 2,263
7	J11-2001	Lexicon-Based Methods for Sentiment Analysis	Taboada, Maite and Brooke, Jul	2011	htt 📕 1,982
8	P05-1015	Seeing Stars: Exploiting Class Relationships for Sentiment Categorizati	Pang, Bo and Lee, Lillian	2005	htt 📕 1,743
9	P07-1056	Biographies, Bollywood, Boom-boxes and Blenders: Domain Adaptation	Blitzer, John and Dredze, Mark	2007	htt 📕 1,735
10	C04-1200	Determining the Sentiment of Opinions	Kim, SooMin and Hovy, Eduard	2004	htt 📕 1,723

Year of publication

#citations

17

D. Authors

1	Pang, Bo				13,	039
2	Lee, Lillian				13,	039
3	Vaithyanathan, Shi		8	,187		
4	Turney, Peter		6,14	8		
5	Ng, Andrew Y.		5,158			
6	Manning, Christoph		4,518			
7	Wilson, Theresa		4,502			
8	Wiebe, Janyce		4,409			
9	Potts, Christopher	1	4,257			
10	Socher, Richard		3,823			

Unigram #emotional affect emotional emotional emotions orientation sentiment stance valence	Bigram	Author Name

OK 5K 10K

A2. #papers, by year of publication A1. #papers



NLP Scholar Dashboard

Clicking on the 2016 bar in the **#papers by year** viz (A2)

C. Papers

2K

OK

tions

40K

20K

0K

Row	Paper-Id	Paper-Title	Author(s)	Year	Url	
1	N16-3020	"Why Should I Trust You?": Explaining the Predictions of Any Classifier	Ribeiro, Marco Tulio and Singh,	2016	htt	1,387
2	P16-1162	Neural Machine Translation of Rare Words with Subword Units	Sennrich, Rico and Haddow, Bar	2016	htt	1,028
3	N16-1030	Neural Architectures for Named Entity Recognition	Lample, Guillaume and Balleste	2016	htt	957
4	N16-1174	Hierarchical Attention Networks for Document Classification	Yang, Zichao and Yang, Diyi and	2016	htt	952
5	D16-1264	SQuAD: 100,000+ Questions for Machine Comprehension of Text	Rajpurkar, Pranav and Zhang, Ji	2016	htt	748
6	P16-1101	End-to-end Sequence Labeling via Bi-directional LSTM-CNNs-CRF	Ma, Xuezhe and Hovy, Eduard	2016	htt	611
7	S16-1001	SemEval-2016 Task 4: Sentiment Analysis in Twitter	Nakov, Preslav and Ritter, Alan	2016	htt	567
8	K16-1002	Generating Sentences from a Continuous Space	Bowman, Samuel and Vilnis, Lu	2016	htt	561
9	S16-1002	SemEval-2016 Task 5: Aspect Based Sentiment Analysis	Pontiki, Maria and Galanis, Dim	2016	htt	549
10	D16-1044	Multimodal Compact Bilinear Pooling for Visual Question Answering an.	Fukui, Akira and Park, Dong Huk	2016	htt	430

012	11/	21
UN:	- T.V.	£.D.

#citations

D. Authors

Row Author-name Dyer, Chris 1 2,886 Hovy, Eduard 2,000 2 Haddow, Barry 1,919 Sennrich, Rico 1,730 4 Birch, Alexandra 1,583 Manning, Christoph.. 1,455 Singh, Sameer 1,414 8 Ribeiro, Marco Tulio 📕 1,387 9 Guestrin, Carlos 1,387 10 Goldberg, Yoav 1,326 0K 1K 2K

1965	0			D	2019
Unigram		Bigram	Author Name		

A1. #papers A2. #papers, by year of publication





Clicking on 'Manning, Christopher' in the Authors List (D)

6	Da	-	-	-	
L.	Pd	P	e	5	

200

100

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Row	Paper-Id	Paper-Title	Author(s) Y	/ear	Url
1	D14-1162	Glove: Global Vectors for Word Representation	Pennington, Jeffrey and Socher. 2	2014	htt 7,965
2	P14-5010	The Stanford CoreNLP Natural Language Processing Toolkit	Manning, Christopher D. and Su. 2	2014	htt 3,543
3	P03-1054	Accurate Unlexicalized Parsing	Klein, Dan and Manning, Christo 2	2003	htt 3,196
4	N03-1033	Feature-Rich Part-of-Speech Tagging with a Cyclic Dependency Network	Toutanova, Kristina and Klein, D 2	2003	htt 🔜 3,083
5	D13-1170	Recursive Deep Models for Semantic Compositionality Over a Sentimen	Socher, Richard and Perelygin, 2	2013	htt 🗾 2,798
6	P05-1045	Incorporating Non-local Information into Information Extraction Syste	Finkel, Jenny Rose and Grenage 2	2005	htt., 🔜 2,765
7	L06-1-260	Generating Typed Dependency Parses from Phrase Structure Parses	de Marneffe, MarieCatherine a 2	2006	htt., 🔜 2,414
8	D15-1166	Effective Approaches to Attention-based Neural Machine Translation	Luong, Minh-Thang and Pham, 2	2015	htt 📕 1,961
9	D09-1026	Labeled LDA: A supervised topic model for credit attribution in multi-lab	Ramage, Daniel and Hall, David 2	2009	htt 📕 1,168
10	W00-1308	Enriching the Knowledge Sources Used in a Maximum Entropy Part-of-S.	Toutanvoa, Kristina and Mannin 2	2000	htt., 📕 1,164

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10	Dyer, Chris	14,745



Unigram	Bigram	Author Name	

A1. #papers A2. #papers, by year of publication





Clicking on 'Lee, Lillian' in the Authors List (D)

C.	Pa	pe	ers
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30

20

10

Row	Paper-Id	Paper-Title	Author(s)	Year	Url	
1	W02-1011	Thumbs up? Sentiment Classification using Machine Learning Techniques	Pang, Bo and Lee, Lillian and Vai	2002	htt	8,187
2	P04-1035	A Sentimental Education: Sentiment Analysis Using Subjectivity Summa	Pang, Bo and Lee, Lillian	2004	htt	3,109
3	P05-1015	Seeing Stars: Exploiting Class Relationships for Sentiment Categorizati	Pang, Bo and Lee, Lillian	2005	htt	1,743
4	P93-1024	DISTRIBUTIONAL CLUSTERING OF ENGLISH WORDS	Pereira, Fernando and Tishby, N	1993	htt.,	1,322
5	P99-1004	Measures of Distributional Similarity	Lee, Lillian	1999	htt	697
6	W06-1639	Get out the vote: Determining support or opposition from Congressiona	Thomas, Matt and Pang, Bo and	2006	htt	536
7	N03-1003	Learning to Paraphrase: An Unsupervised Approach Using Multiple-Seq	Barzilay, Regina and Lee, Lillian	2003	htt.	504
8	N04-1015	Catching the Drift: Probabilistic Content Models, with Applications to G.	Barzilay, Regina and Lee, Lillian	2004	htt	341
9	P94-1038	Similarity-Based Estimation of Word Cooccurrence Probabilities	Dagan, Ido and Pereira, Fernan	1994	htt	183
10	W11-0609	Chameleons in Imagined Conversations: A New Approach to Understand	DanescuNiculescuMizil, Cristia	2011	htt	147

OK 5K 10K

#citations

D. Authors







Clicking on 'ACL' in the Venue and Paper Type treemap (F1)



C. Papers

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8	P95-1026	UNSUPERVISED WORD SENSE DISAMBIGUATION RIVALING SUPERVISE.	Yarowsky, David	1995	htt.	2,480
9	P14-1062	A Convolutional Neural Network for Modelling Sentences	Kalchbrenner, Nal and Grefenst.	2014	htt.	1,794
10	P10-1040	Word Representations: A Simple and General Method for Semi-Supervis.	Turian, Joseph and Ratinov, Lev.	2010	htt.	1,753

OK 5K 10K #citations

D. Authors

E. Search by year of publication, title term (unigram, bigram), or author name



#citations





F1. Venue and Paper Type



Clicking on 'Workshops' in the Venue and Paper Type treemap (F1)



C. Papers

Row	Paper-Id	Paper-Title	Author(s)	Year	Url	
1	W04-1013	ROUGE: A Package for Automatic Evaluation of Summaries	Lin, Chin-Yew	2004	htt_	3,349
2	W02-0109	NLTK: The Natural Language Toolkit	Loper, Edward and Bird, Steven	2002	htt.	2,128
3	W14-4012	On the Properties of Neural Machine Translation: Encoder-Decoder App.	Cho, Kyunghyun and van Merrie	2014	htt.	1,673
4	W00-0403	Centroid-based summarization of multiple documents: sentence extract	Radev, Dragomir and Jing, Hon.	2000	htt.	1,480
5	W05-0909	METEOR: An Automatic Metric for MT Evaluation with Improved Correla	Banerjee, Satanjeev and Lavie,	2005	htt.	1,469
6	W95-0107	Text Chunking using Transformation-Based Learning	Ramshaw, Lance and Marcus, M.	1995	htt.	1,370
7	W11-0705	Sentiment Analysis of Twitter Data	Agarwal, Apoorv and Xie, Boyia	2011	htt_	1,369
8	W97-0703	Using Lexical Chains for Text Summarization	Barzilay, Regina and Elhadad,	1997	htt.	1,302
9	H94-1020	THE PENN TREEBANK: ANNOTATING PREDICATE ARGUMENT STRUCTURE	Marcus, Mitch and Kim, Grace a	1994	htt.	834
10	W00-0726	Introduction to the CoNLL-2000 Shared Task Chunking	Tjong Kim Sang, Erik and Buchh	2000	htt.	800

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D. Authors



#citations

Unigram







Clicking on 'parsing' in the Title Unigrams treemap (F2)



C. Papers

Row	Paper-Id	Paper-Title	Author(s)	Year	Url	
1	P03-1054	Accurate Unlexicalized Parsing	Klein, Dan and Manning, Christo.	2003	htt.,	3,196
2	J03-4003	Head-Driven Statistical Models for Natural Language Parsing	Collins, Michael	2003	htt	2,271
3	N03-1028	Shallow Parsing with Conditional Random Fields	Sha, Fei and Pereira, Fernando	2003	htt	1,689
4	P05-1022	Coarse-to-Fine n-Best Parsing and MaxEnt Discriminative Reranking	Charniak, Eugene and Johnson,	2005	htt	1,184
5	J97-3002	Stochastic Inversion Transduction Grammars and Bilingual Parsing of P.	Wu, Dekai	1997	htt	1.015
6	W06-2920	CoNLL-X Shared Task on Multilingual Dependency Parsing	Buchholz, Sabine and Marsi, Er	2006	htt	911
7	H05-1066	Non-Projective Dependency Parsing using Spanning Tree Algorithms	McDonald, Ryan and Pereira, Fe	2005	htt.	905
8	J05-1003	Discriminative Reranking for Natural Language Parsing	Collins, Michael and Koo, Terry	2005	htt	832
9	P13-1045	Parsing with Compositional Vector Grammars	Socher, Richard and Bauer, Joh	2013	htt	748
10	D07-1096	The CoNLL 2007 Shared Task on Dependency Parsing	Nivre, Joakim and Hall, Johan a.,	2007	htt	699

Year of publication

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Unigram

E. Search by year of publication, title term (unigram, bigram), or author name

Bigram

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D. Authors

Row Author-name Nivre, Joakim Manning, Christoph 6,350 Collins, Michael 5.741 Klein, Dan 5.140 Johnson, Mark 3,248 Pereira, Fernando 3,153 Charniak, Eugene 3,114 McDonald, Ryan 2,934 Nilsson, Jens 2,213 10 Hall, Johan 1,868 OK 2K 4K 6K 8K

#citations

papers 750 4,162

Author Name





Clicking on 'statistical' in the Title Unigrams treemap (F2)



C. Papers

Row	Paper-Id	Paper-Title	Author(s)	Year	Url	
1	D14-1179	Learning Phrase Representations using RNN Encoder-Decoder for Stati.	Cho, Kyunghyun and van Merrie	2014	htt.	5,344
2	J93-2003	The Mathematics of Statistical Machine Translation: Parameter Estima.	Brown, Peter F. and Della Pietra.	1993	htt	5,047
3	P07-2045	Moses: Open Source Toolkit for Statistical Machine Translation	Koehn, Philipp and Hoang, Hieu	2007	htt.	4,581
4	J03-1002	A Systematic Comparison of Various Statistical Alignment Models	Och, Franz Josef and Ney, Herm	2003	htt	4,040
5	N03-1017	Statistical Phrase-Based Translation	Koehn, Philipp and Och, Franz J	2003	htt	3,501
6	P03-1021	Minimum Error Rate Training in Statistical Machine Translation	Och, Franz Josef	2003	htt	3,023
7	J03-4003	Head-Driven Statistical Models for Natural Language Parsing	Collins, Michael	2003	htt.	2,271
8	J90-2002	A Statistical Approach to Machine Translation	Brown, Peter F. and Cocke, John	1990	htt	2,102
9	P05-1033	A Hierarchical Phrase-Based Model for Statistical Machine Translation	Chiang, David	2005	htt	1,288
10	P02-1038	Discriminative Training and Maximum Entropy Models for Statistical M.	Och, Franz Josef and Nev, Herm.	2002	htt.	1.240

OK 5K #citations

D. Authors

Row Author-name Och, Franz Josef 15,989 Koehn, Philipp 14,435 12,308 Nev, Hermann Brown, Peter F. 7,748 Mercer, Robert L. 7,747 Della Pietra, Vincen.. Della Pietra, Stephe. 1000000 7,747 CallisonBurch, Chris Manuel 7,563 Schwenk, Holger 5,726 10 Zens, Richard 5,705 OK 10K ZÓK #citations





F2. Title Unigrams

Clicking on 'neural' in the Title Unigrams treemap (F2)





C. Papers

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Row	Paper-Id	Paper-Title	Author(s)	Year	Url
1	D14-1181	Convolutional Neural Networks for Sentence Classification	Kim, Yoon	2014	htt 4,362
2	D15-1166	Effective Approaches to Attention-based Neural Machine Translation	Luong, Minh-Thang and Pham,	2015	htt 1,961
3	P14-1062	A Convolutional Neural Network for Modelling Sentences	Kalchbrenner, Nal and Grefenst.	2014	htt 1,794
4	W14-4012	On the Properties of Neural Machine Translation: Encoder-Decoder App	Cho, Kyunghyun and van Merrie	2014	htt 1.673
5	D14-1082	A Fast and Accurate Dependency Parser using Neural Networks	Chen, Dangi and Manning, Chris	2014	htt 1,110
6	P16-1162	Neural Machine Translation of Rare Words with Subword Units	Sennrich, Rico and Haddow, Bar	2016	htt 1,028
7	N16-1030	Neural Architectures for Named Entity Recognition	Lample, Guillaume and Balleste	2016	htt 📕 957
8	D15-1044	A Neural Attention Model for Abstractive Sentence Summarization	Rush, Alexander M. and Chopra,	2015	htt 910
9	C14-1008	Deep Convolutional Neural Networks for Sentiment Analysis of Short Te	dos Santos, Cicero and Gatti, M.	2014	htt 📕 697
10	D15-1167	Document Modeling with Gated Recurrent Neural Network for Sentime.	Tang, Duyu and Qin, Bing and Li	2015	htt 📕 606

Year of publication

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Unigram

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D. Authors

F2. Title Unigrams

Row Author-name Kim, Yoon 4,828 Manning, Christoph. 3,959 Cho, Kyunghyun 3,292 Luong, Minh-Thang 3,196 12 2,816 Bengio, Yoshua Sennrich, Rico 2,138 Blunsom, Phil 2,019 Haddow, Barry 1,983 Kalchbrenner, Nal 1,980 10 Pham, Hieu 1,975 OK ZK 4K 68

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E. Search by year of publication, title term (unigram, bigram), or author name

Bigram

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Clicking on `machine translation' in the Title Bigrams treemap (F3)



C. Papers

Row	Paper-Id	Paper-Title	Author(s)	Year	Url
1	P02-1040	Bleu: a Method for Automatic Evaluation of Machine Translation	Papineni, Kishore and Roukos, S.	2002	htt 9,098
2	D14-1179	Learning Phrase Representations using RNN Encoder-Decoder for Stati.	Cho, Kyunghyun and van Merrie	2014	htt 5,344
3	J93-2003	The Mathematics of Statistical Machine Translation: Parameter Estima.	Brown, Peter F. and Della Pietra	1993	htt 5,047
4	P07-2045	Moses. Open Source Toolkit for Statistical Machine Translation	Koehn, Philipp and Hoang, Hieu	2007	htt 4,581
5	P03-1021	Minimum Error Rate Training in Statistical Machine Translation	Och, Franz Josef	2003	htt 3,023
6	J90-2002	A Statistical Approach to Machine Translation	Brown, Peter F. and Cocke, John.	1990	htt 🎬 2,102
7	D15-1166	Effective Approaches to Attention-based Neural Machine Translation	Luong, Minh-Thang and Pham,	2015	htt. 📕 1,961
8	W14-4012	On the Properties of Neural Machine Translation: Encoder-Decoder App	Cho, Kyunghyun and van Merrie	2014	htt 1,673
9	P05-1033	A Hierarchical Phrase-Based Model for Statistical Machine Translation	Chiang, David	2005	htt 🔳 1,288
10	P02-1038	Discriminative Training and Maximum Entropy Models for Statistical M.	Och, Franz Josef and Nev, Herm.	2002	htt. 1.240

Year of publication

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F3. Title Bigrams



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Bigram



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Clicking on 'question answering' in the Title Bigrams treemap (F3)

A1. #papers A2. #papers, by year of publication



B2. #citations, by year of publication



C. Papers

Row	Paper-Id	Paper-Title	Author(s)	Year	Url		
1	P02-1006	Learning surface text patterns for a Question Answering System	Ravichandran, Deepak and Hov	2002	htt_	1,001.0	
2	D16-1044	Multimodal Compact Bilinear Pooling for Visual Question Answering an.	Fukui, Akira and Park, Dong Huk.	2016	htt	430.0	
3	W02-1033	An Analysis of the AskMSR Question-Answering System	Brill, Eric and Dumais, Susan an	2002	htt	384.0	1
4	D07-1002	Using Semantic Roles to Improve Question Answering	Shen, Dan and Lapata, Mirella	2007	htt.,	354.0	
5	P02-1005	Performance Issues and Error Analysis in an Open-Domain Question Ans	Moldovan, Dan and Pasca, Mari	2002	htt	350.0	
6	D14-1067	Question Answering with Subgraph Embeddings	Bordes, Antoine and Chopra, Su	2014	htt.,	318.0	
7	P14-1090	Information Extraction over Structured Data: Question Answering with .	Yao, Xuchen and Van Durme, Be.	2014	htt.	256.0	
8	N16-1181	Learning to Compose Neural Networks for Question Answering	Andreas, Jacob and Rohrbach,	2016	htt	255.0	
9	D14-1070	A Neural Network for Factoid Question Answering over Paragraphs	lyyer, Mohit and BoydGraber, J	2014	htt	255.0	
10	D15-1237	WikiQA: A Challenge Dataset for Open-Domain Question Answering	Yang, Yi and Yih, Wentau and M.,	2015	htt.	250.0	١.

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D. Authors



Clicking on 'word embeddings' in the Title Bigrams treemap (F3)

A1. #papers A2. #papers, by year of publication





C. Papers

Row	Paper-Id	Paper-Title	Author(s)	Year	Url	
1	Q15-1016	Improving Distributional Similarity with Lessons Learned from Word E.	Levy, Omer and Goldberg, Yoav	2015	htt.,	718.0
2	P14-2050	Dependency-Based Word Embeddings	Levy, Omer and Goldberg, Yoav	2014	htt	673.0
3	D13-1141	Bilingual Word Embeddings for Phrase-Based Machine Translation	Zou, Will Y. and Socher, Richard .	2013	htt	395.0
4	D15-1036	Evaluation methods for unsupervised word embeddings	Schnabel, Tobias and Labutov, I.	2015	htt	233.0
5	P16-1141	Diachronic Word Embeddings Reveal Statistical Laws of Semantic Chan.	Hamilton, William L. and Leskov	2016	htt	215.0
6	P15-1077	Gaussian LDA for Topic Models with Word Embeddings	Das, Rajarshi and Zaheer, Manz	2015	htt	152.0
7	P14-1113	Learning Semantic Hierarchies via Word Embeddings	Fu, Ruiji and Guo, Jiang and Qin,	2014	htt.	152.0
8	D15-1168	Fine-grained Opinion Mining with Recurrent Neural Networks and Word.	Liu, Pengfel and Joty, Shafiq an.	2015	htt	130.0
9	P16-1035	Query Expansion with Locally-Trained Word Embeddings	Diaz, Fernando and Mitra, Bhas.	2016	htt	127.0
10	P15-2070	PPDB 2.0: Better paraphrase ranking, fine-grained entailment relations.	Pavlick, Ellie and Rastogi, Push.	2015	htt.	120.0

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3. Title Bigr	ams			#papers	s 0—	D	200,150
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Clicking on 'Chinese' in the Languages treemap (F4)



C. Papers

Row	Paper-Id	Paper-Title	Author(s)	Year	Url	
1	W03-1730	HHMM-based Chinese Lexical Analyzer ICTCLAS	Zhang, HuaPing and Yu, HongKu	2003	htt.	545.0
2	W03-1728	Chinese Word Segmentation as LMR Tagging	Xue, Nianwen and Shen, Libin	2003	htt	517.0
3	CO4-1081	Chinese Segmentation and New Word Detection using Conditional Rand.	Peng, Fuchun and Feng, Fangfa	2004	htt.	480.0
4	J96-3004	A Stochastic Finite-State Word-Segmentation Algorithm for Chinese	Sproat, Richard and Shih, Chilin	1996	htt	450.0
5	W03-1719	The First International Chinese Word Segmentation Bakeoff	Sproat, Richard and Emerson, T.	2003	htt	405.0
6	C10-3004	LTP: A Chinese Language Technology Platform	Che, Wanxiang and Li, Zhenghu	2010	htt	367.0
7	W06-3812	Chinese Whispers - an Efficient Graph Clustering Algorithm and its Appli	Biemann, Chris	2006	htt.	310.0
8	P94-1012	ALIGNING A PARALLEL ENGLISH-CHINESE CORPUS STATISTICALLY WITH	Wu, Dekai	1994	htt	295.0
9	W08-0335	Optimizing Chinese Word Segmentation for Machine Translation Perfor.	Chang, PiChuan and Galley, Mic.,	2008	htt	293.0
10	P03-1056	Is it Harder to Parse Chinese, or the Chinese Treebank?	Levy, Roger and Manning, Chris.	2003	htt.	272.0

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Clicking on 'Swahili' in the Languages treemap (F4)



C. Papers

Row	Paper-Id	Paper-Title	Author(s)	Year	Url				
1	W05-0504	Refining the SED Heuristic for Morpheme Discovery: Another Look at S	Hu, Yu and Matveeva, Irina and	2005	htt.			12.0	000
2	W16-5803	Word-Level Language Identification and Predicting Codeswitching Point.	Piergallini, Mario and Shirvani,	2016	htt		1	0.000	0
3	L14-1-686	Morphological parsing of Swahili using crowdsourced lexical resources	Littell, Patrick and Price, Kaitly	2014	htt	4	.000		
4	W09-0702	The SAWA Corpus: A Parallel Corpus English - Swahili	Pauw, Guy De and Wagacha, Pe.	2009	htt				
5	CO4-1037	Optimizing disambiguation in Swahili	Hurskainen, Arvi	2004	htt				
						0 5	10	15	20

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								swahili 5

Summary

NLP Scholar—an interactive visual explorer for the ACL Anthology

- access to citation information from Google Scholar
- interconnected interactive visualizations (multiple dashboards)
- quickly and efficiently search for relevant related work

Future Work:

- automatically identifying related papers
- analyze NLP papers that are published outside of the ACL Anthology
- compare patterns of citations in NLP with those in other fields
- develop richer ways of capturing scholarly impact

Project page for NLP Scholar: http://saifmohammad.com/WebPages/nlpscholar.html

- data
- Interactive visualizations
- limitations and ethical considerations







