Natural Language Processing

Natural language processing (NLP) is a field of computer science, artificial intelligence, and linguistics concerned with the interactions between computers and human (natural) languages. As such, NLP is related to the area of human–computer interaction. Many challenges in NLP involve natural language understanding - that is, enabling computers to derive meaning from human or natural language input.

Knowledge item description	References
Beginner	
Understanding the concept of regular expressions	[1.1], [1.2], [2.1]
Edit distance	[1.3]
N-gram models	[1.4], [2.5]
Spelling correction	[1.5]
Finite-State automata	[2.2]
Competent	
Text classification	[1.6]
Sentiment analysis	[1.7]
Discriminative classifiers: Maximum Entropy classifiers	[1.8]
Named entity recognition and Maximum Entropy Sequence Models	[1.9]
Relation Extraction	[1.10]
Advanced Maximum Entropy Models	[1.11]
POS Tagging	[1.12]
Parsing Introduction	[1.13]
Computational Phonology and Text-to-Speech	[2.3]
Probabilistic Models for Pronunciation and Spelling	[2.4]
Expert	
Probabilistic Parsing	[1.14]
Lexicalized Parsing	[1.15]
Dependency Parsing	[1.16]
Information Retrieval	[1.17]
Ranked Information Retrieval	[1.18]
Semantics	[1.19]
Question Answering	[1.20]
Summarization	[1.21]
Pragmatics	[2.8]
Deep learning approach no NLP	[3.1]
Vector word representation	[3.2], [3.3], [3.4], [3.5], [3.6], [3.7]
Recurrent neural networks for NLP tasks	[3.8], [3.9], [3.10], [3.11]
Convolutional neural networks for NLP	[3.12]

References

#	Reference	Link
1.	Coursera Class: Natural Language Processing by Dan Jurafsky, Christopher Manning	Link
1.1.	Course Introduction	
1.2.	Basic Text Processing	
1.3.	Edit Distance	
1.4.	Language Modeling	
1.5.	Spelling Correction	
1.6.	Text Classification	
1.7.	Sentiment Analysis	
1.8.	Discriminative classifiers: Maximum Entropy classifiers	
1.9.	Named entity recognition and Maximum Entropy Sequence Models	
1.10.	Relation Extraction	
1.11.	Advanced Maximum Entropy Models	
1.12.	POS Tagging	
1.13.	Parsing Introduction	
1.14.	Probabilistic Parsing	
1.15.	Lexicalized Parsing	
1.16.	Dependency Parsing	
1.17.	Information Retrieval	
1.18.	Ranked Information Retrieval	
1.19.	Semantics	
1.20.	Question Answering	
1.21.	Summarization	
2.	Jurafsky and Martin, Speech and Language Processing	TBD
2.1.	Regular expressions and Automata	
2.2.	Morphology and Finite-State Transducers	
2.3.	Computational Phonology and Text-to-Speech	
2.4.	Probabilistic Models of Pronunciation and Spelling	
2.5.	N-grams	
2.6.	HMMs and Speech Recognition	
2.7.	Semantics	
2.8.	Pragmatics	
3.	Stanford CS224d: Deep Learning for Natural Language Processing	Link
3.1.	Intro to NLP and Deep Learning	
3.2.	Simple Word Vector representations: word2vec, GloVe	
3.3.	Advanced word vector representations: language models, softmax, single layer networks	

3.4.	Neural Networks and backpropagation -- for named entity recognition	
3.5.	Project Advice, Neural Networks and Back-Prop (in full gory detail)	
3.6.	Practical tips: gradient checks, overfitting, regularization, activation functions, details	
3.7.	Introduction to Tensorflow	
3.8.	Recurrent neural networks -- for language modeling and other tasks	
3.9.	GRUs and LSTMs -- for machine translation	
3.10.	Recursive neural networks -- for parsing	
3.11.	Recursive neural networks -- for different tasks (e.g. sentiment analysis)	
3.12.	Convolutional neural networks -- for sentence classification	