

Word Sense Disambiguation

John Gamboa

Word senses (from the Wordnet)

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She went down to the river and stood on the bank

She went to town to take some money out of the bank

(from Jackendoff's book)

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Noun

- [S:](#) (n) **bank** (sloping land (especially the slope beside a body of water)) *"they pulled the canoe up on the bank"; "he sat on the bank of the river and watched the currents"*
- [S:](#) (n) [depository financial institution](#), **bank**, [banking concern](#), [banking company](#) (a financial institution that accepts deposits and channels the money into lending activities) *"he cashed a check at the bank"; "that bank holds the mortgage on my home"*
- [S:](#) (n) **bank** (a long ridge or pile) *"a huge bank of earth"*
- [S:](#) (n) **bank** (an arrangement of similar objects in a row or in tiers) *"he operated a bank of switches"*
- [S:](#) (n) **bank** (a supply or stock held in reserve for future use (especially in emergencies))
- [S:](#) (n) **bank** (the funds held by a gambling house or the dealer in some gambling games) *"he tried to break the bank at Monte Carlo"*
- [S:](#) (n) **bank** [cut](#), [camber](#) (a slope in the turn of a road or track; the outside is higher)

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Say we have the following sentences:

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bank#2

Noun

- **S: (n) bank** (sloping land (especially the slope beside a body of water)) *"they pulled the canoe up on the bank"; "he sat on the bank of the river and watched the currents"*
- **S: (n) depository financial institution, bank, banking concern, banking company** (a financial institution that accepts deposits and channels the money into lending activities) *"he cashed a check at the bank"; "that bank holds the mortgage on my home"*
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- **S: (n) bank** **cont. embank** (a slope in the turn of a road or track; the outside is higher

Lesk Algorithm

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Sentence

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Sentence

“The little larva went down the **wormhole** and appeared at the other side of the book”

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Disclaimer

I was eventually told that this usage of “wormhole” is quite awkward here. Still... it will do for our purposes...

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Wormhole *noun*

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First we need to lemmatize the sentences...

Then we just apply the algorithm again....

Lemmatized Lesk Algorithm

Sentence

“The little larva go down the wormhole
at the other side of the book?”

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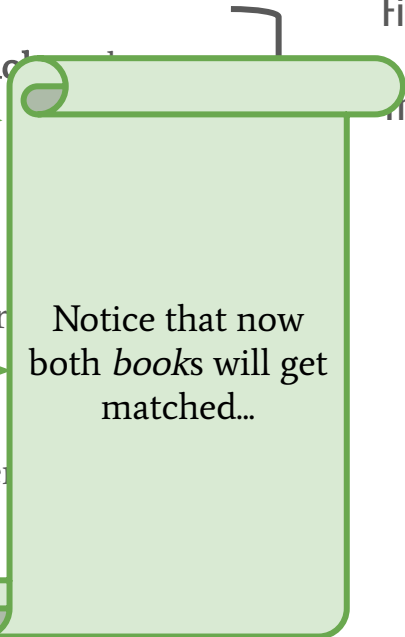
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Notice that now
both *books* will get
matched..

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(this is what is implemented in the NLTK)

More or less recent papers related to WSD...

([link](#))

An Enhanced Lesk Word Sense Disambiguation Algorithm through a Distributional Semantic Model

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Abstract

This paper describes a new Word Sense Disambiguation (WSD) algorithm which extends two well-known variations of the Lesk WSD method. Given a word and its context, Lesk algorithm exploits the idea of maximum number of shared words (maximum overlaps) between the context of a word and each definition of its senses (gloss) in order to select the proper meaning. The main contribution of our approach relies on the use of a word similarity function defined on a distributional semantic space to compute the gloss-context overlap. As sense inventory we adopt Babel-

([link](#))

Word Sense Disambiguation using a Bidirectional LSTM

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Abstract

In this paper we present a clean, yet effective, model for *word sense disambiguation*. Our approach leverage a *bidirectional long short-term memory* network which is shared between all words. This enables the model to share statistical strength and to scale well with vocabulary size. The model is trained *end-to-end*, directly from the raw text to sense labels, and makes effective use of word order. We evaluate our approach on two standard datasets, using identical hyperparameter settings, which are in turn tuned on a third set of held out data. We employ no external resources (e.g. knowledge graphs, part-of-speech tagging, etc), language specific features, or hand crafted rules, but still achieve statistically equivalent results to the best *state-of-the-art* systems, that employ no such limitations.