WORD SENSE DISAMBIGUATION ALGORITHMS IN HINDI

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Word Sense Disambiguation

The task of automatically assigning a sense to an ambiguous word according to the context in which it is present.

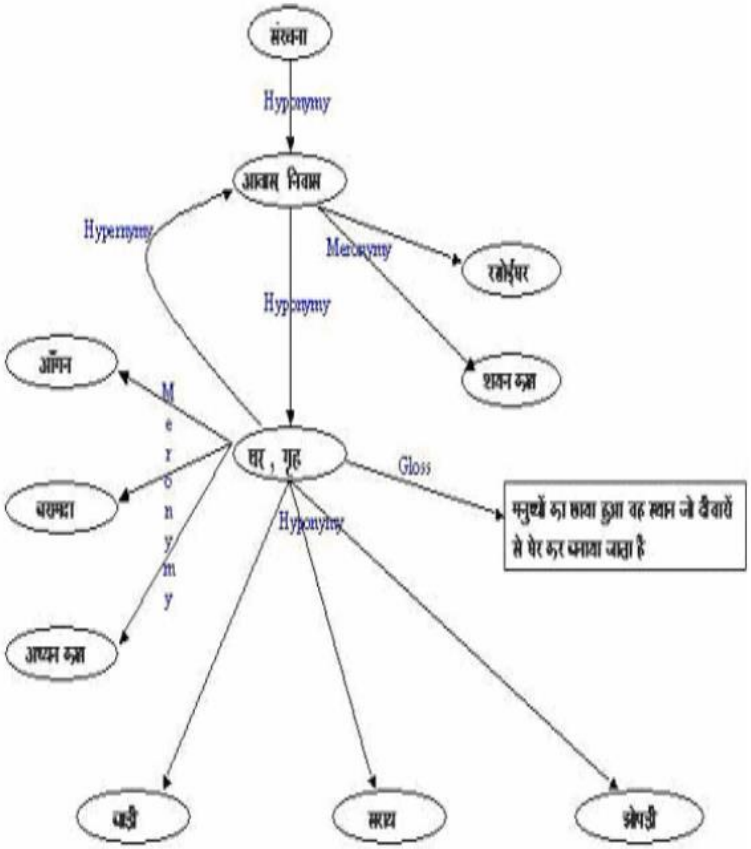
“सफाई”

Sense 1 - *"हर वस्तु की सफ़ाई जरूरी है"*

Sense 2 - *"हमें सफ़ाई देने की जरुरत नहीं है"*

Hindi Wordnet

- A lexical database which has semantic relations between words
- For each word, its different senses are provided
- Each sense has a
  - Synset
  - Gloss
  - Semantic Relations (Homonymy, Hypernymy)



Hindi Wordnet

Noun(3)

1. **सफ़ाई**, **सफाई**, **मार्जन**, **अवदान**, **अवधावन**, **उज्वलन**, **उज्ज्वलन** - साफ करने की क्रिया *"हर वस्तु की सफ़ाई जरूरी है ।"*

(R)(E)(A)(Be)(Bo)(G)(K)(Ka)(Ko)(M)(Ma)(Ml)(N)(O)(P)(S)(T)(Te)(U) (Close)

- Ontology Nodes (Close)
- Hyponymy (... is a kind of)
- Hypernymy (is a kind of ...)

2. **स्वच्छता**, **सफ़ाई**, **सफाई**, **शुद्धता**, **शुद्धि**, **निर्मलता**, **सुथरापन**, **साफ़-सफ़ाई**, **साफ-सफाई**, **उज्वलता**, **उज्ज्वलता**, **उजलापन**, **उज्वला**, **उज्ज्वला**, **उजलाई**, **उजराई**, **अमलता**, **पूति**, **धवलिमा** - स्वच्छ होने की अवस्था या भाव *"स्वच्छता बरतने से बीमारियाँ नहीं फैलतीं । / रासायनिक प्रक्रिया द्वारा जल की स्वच्छता बनाई रखी जा सकती है ।"*

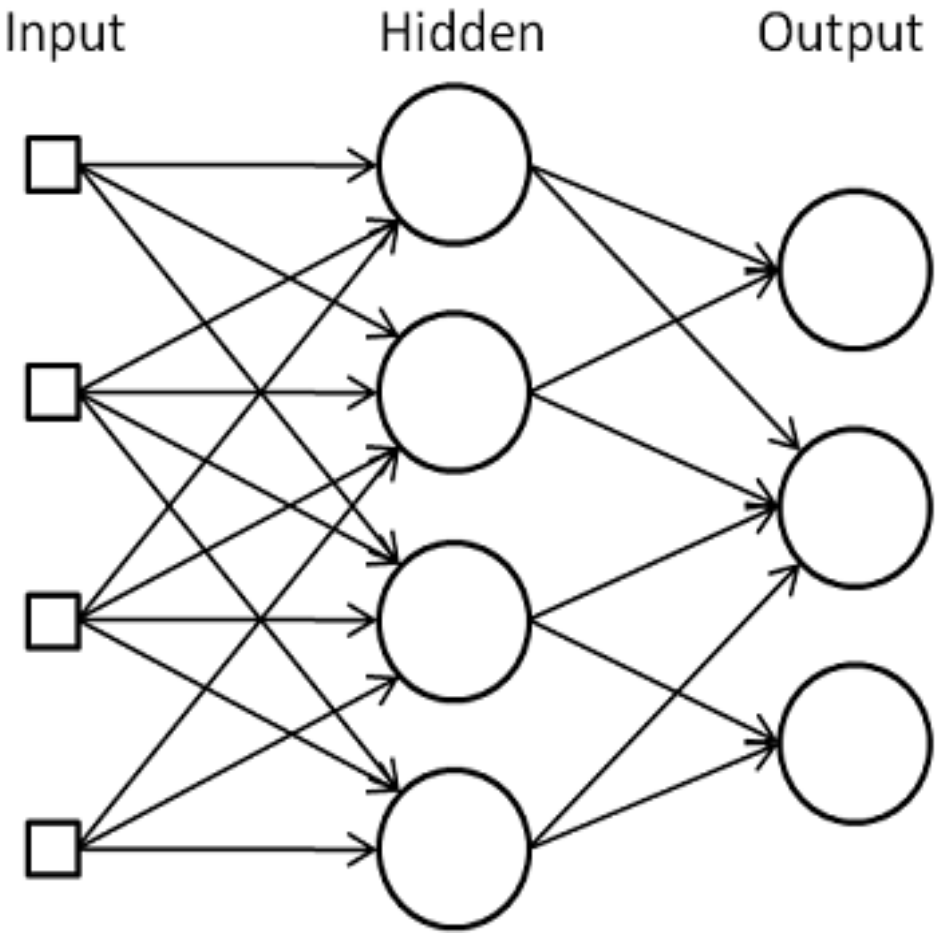
Relations and Languages

3. **सफ़ाई**, **सफाई**, **अभिवचन** - अभियुक्त आदि का अपनी निर्दोषिता प्रमाणित करने के लिए कुछ कहने की क्रिया *"उन्हें सफ़ाई देने का मौका ही नहीं मिला ।"*

Relations and Languages

Mikolov's Word2Vec Model

- Vectorizes a word using a skip-gram model
- The weights learnt form the "features" of the word according to its surroundings



Sense Vector Method

- Word2Vec (skip-gram) model is trained on a POS-tagged Hindi corpus
- For a word to be disambiguated, we create vector representations for each sense by averaging over the vectors of the relevant words in the gloss
- A vector representation for the word to be disambiguated is created by averaging the vectors of the relevant words in its neighbourhood
- We assign it the sense which has maximum cosine similarity with its vector

Older WSD Approaches

- Lesk's Algorithm : We assign that sense to the word which has maximum word-overlap

- Unsupervised clustering : Forming clusters using BOW (Bag Of Words) model for each sense of the word

THANK YOU

References

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