Biologically Inspired Linguistic Habit Graph Networks Used For Text Correction

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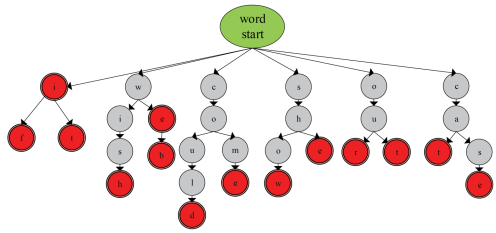
Linguistic Habit Graphs

Novel associative way of storing, compressing, and processing sentences.

Graph models that could be used for spell checking, text correction, proof-reading, and compression of sentences.

Graph construction



Word node properties

word	I
wordCounter	5217
startWithBigLetter	5082
startWithSmallLetter	135
startSentence	135
followedByStartingQuote	17
followedByEndingQuote	8
followedByComma	5
mayEndWithComma	5
endWithQuestionMark	3
endWithExclamationMark	6

LHG edge connection types

FOLLOW - letter nodes connections
ASEQ - associative sequence connections
ACON - associative context connections
BASE - word base form connections

The word priority in a given position:

$$w_p(i) = \sum_{n=i-2}^{i+2} o_{nb}(i) * (\frac{1}{2})^{|(i-n)|}$$

Threshold function of a signal potential pass:

$$y_k = \varphi \sum_{j=0}^{m} w_{kj} x_j = \begin{cases} 1 \text{ if } \theta_k \geq 0 \\ 0 \text{ if } \theta_k < 0 \end{cases}$$

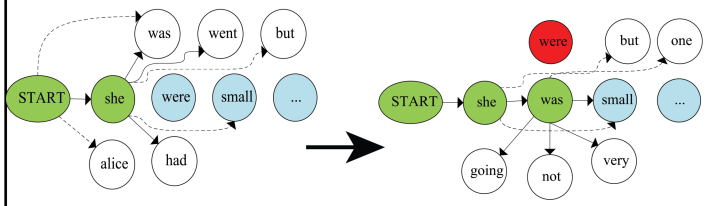
The stimulation of a node:

$$x(t) = \frac{x(t-1)}{2} + extIn(t) + \sum_{n=1}^{N} w_n * intIn_n(t)$$

- external stimulation extIn(t),
- internal stimulation intIn(t),
- its previous state in the time step (t – 1)

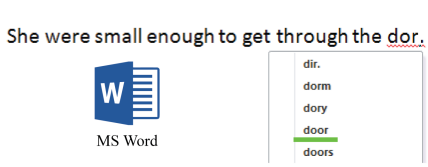
$$w_i = \frac{f_i}{\sum_{j=1}^{J} f_j}$$

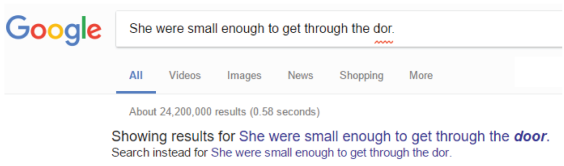
Contextual text correction

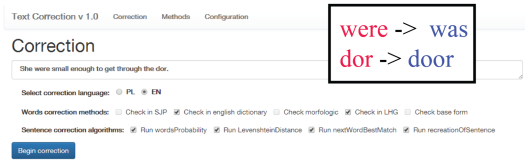


Correction results

She were small enough to get through the dor.







were -> was
dor -> door