

Mnemonic Generator

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What the research paper intended

The paper titled, *Mnemonic phrase generation using genetic algorithms and natural language processing*, by James Mountstephens, intended the automatic generation of mnemonic phrases for information in the form of lists. The paper has quoted studies that tested the use of mnemonic phrases as an aid to learning, to try and establish that mnemonic phrases are indeed proven ways of information retention techniques.

The approach used by the research paper

The author has used two methods for the automatic generation of mnemonic phrases. The first method directly uses natural language processing (NLP), while the second involves optimization using genetic algorithms.

First method

For a list of words, a phrase structure grammar (PSG) would be used recursively to generate appropriate parts of speech (POS) for each grammatical unit and further to each item in the list. It is possible that the division of the word sequences can have many possible combinations. It is pertinent to make sure that the sentence structure generated is compatible with the initials of the list and the parts of speech assigned to each such initial.

E.g.: For the list {C, H, O, N, P, S}, a certain division of the list yields *article* as the POS for the first initial 'C'. But in the English language there is no article that starts with 'C'.

After ensuring such compatibilities, words must be selected from a lexicon to fill the sentence structure. The challenge then arises in achieving a meaningful sentence while filling the words to the sentence structure. Here, bigram probability is used as the criterion for selection of words to form the sentence.

Second method

The second method approaches the problem using genetic algorithms. Genetic algorithms are inspired from the theory of natural selection, where the fittest individuals are selected for survival and reproduction.

The basic unit in a GA is the chromosome (sentence). A chromosome itself comprises of a sequence of genes (words). Here, from an initial population of chromosomes, the fittest chromosome is selected to reproduce new chromosomes. The author of this paper proposes a

grammar parser together with bigram probability to function as the fitness test of a chromosome. The highest rated chromosome is selected for further reproduction, which should yield much better sentences.

Results and Conclusions of the research paper

Although the methods described by the paper appear to be concrete, the author has not published a detailed Results section to showcase success or the difficulties faced in trying to achieve success. The author seems to have deferred the results/testing for the future. However, the paper highlights the need for the personalization of the mnemonic phrases generated to make them more memorable.

A machine learning implementation

The problem of generating meaningful mnemonic phrases for a list of words can be