

Analogy for puns

Punalogy

A punalogy generator: ideas, goals

by

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Team organisation



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Background & interest:

Main tasks:

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Background & interest:

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Background & interest:

Main tasks:

Introduction

Pun

Figure of speech that exploits a word's meaning/form to create humor

Our project will generate **analogical puns (punalogies)** based on:

- Word semantic similarity ;
- Word morphological similarity.

woman
wheat

is to

womango
wheatdog

as

man
corn

is to

mango
corndog



Analogy - “a is to b as c is to d”

Type of logical proportion

4 objects A, B, C, D are in analogical proportion (i.e. $A : B :: C : D$) iff 3 postulates hold true:

- $A : B :: A : B$ (*reflexivity*);
- $A : B :: C : D \rightarrow C : D :: A : B$ (*symmetry*);
- $A : B :: C : D \rightarrow A : C :: B : D$ (*central permutation*).

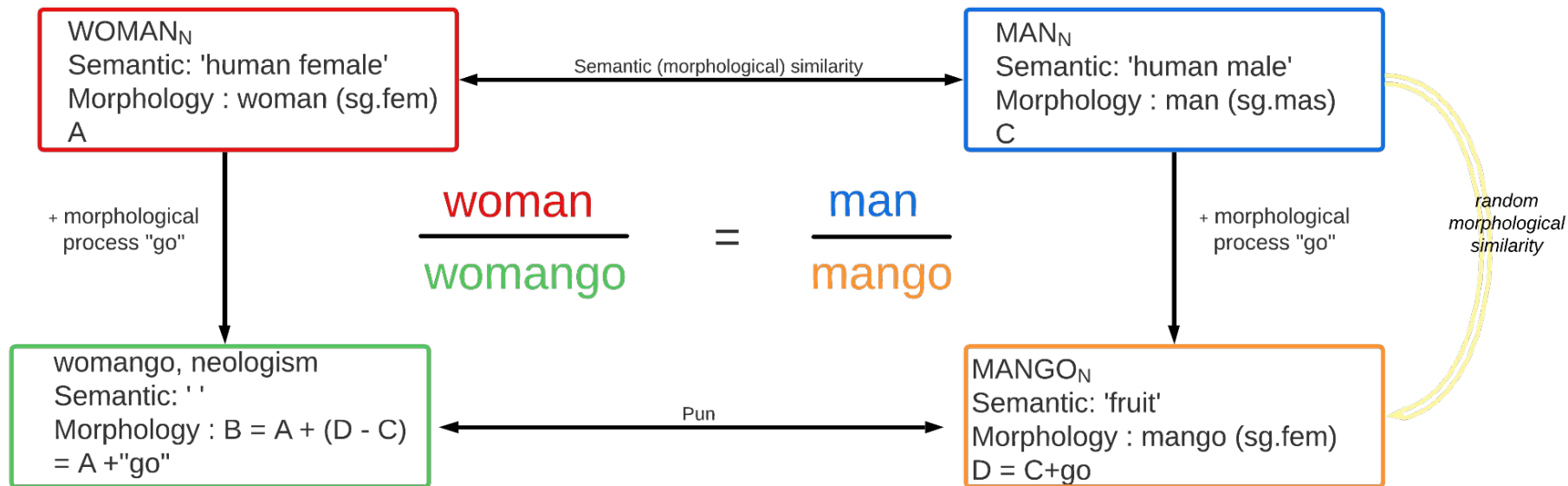
Imply other properties:

- $A : A :: B : B$ (*identity*);
- $A : B :: C : D \rightarrow B : A :: D : C$ (*inside pair reversing*);
- $A : B :: C : D \rightarrow D : B :: C : A$ (*extreme permutation*)

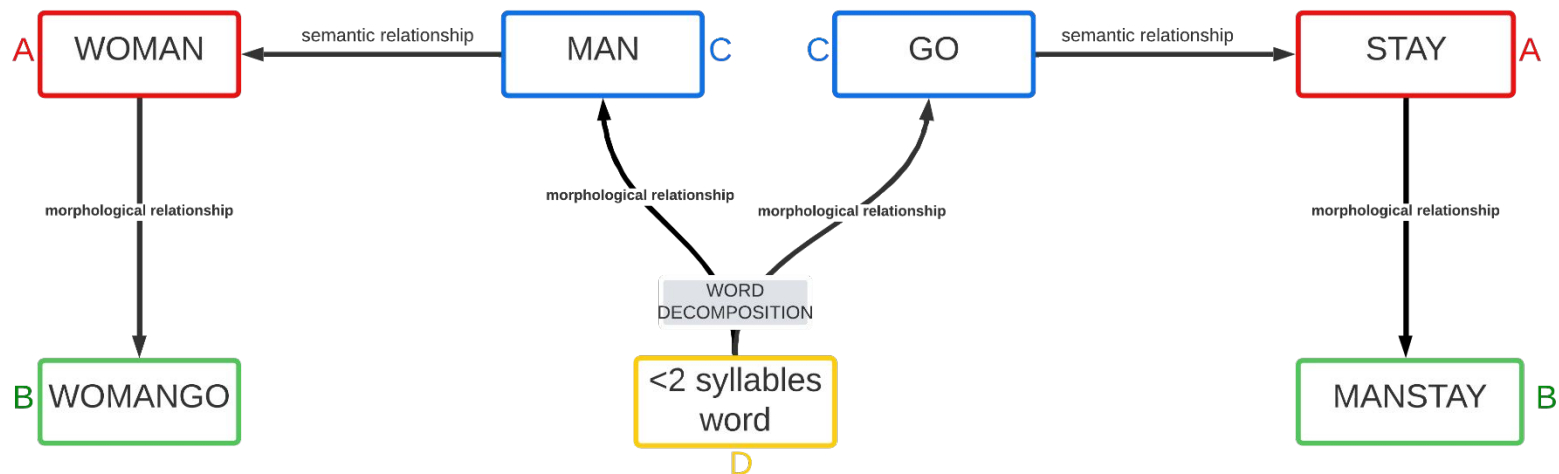
Tasks:
Analogy detection,
analogy solving

Punalogy- Unidirectional Approach

woman is to womango as man is to mango



Punalogy- Bidirectional Approach



WOMAN
WOMANGO

=

MAN
MANGO

GO
MANGO

=

STAY
MANSTAY

woman is to womango as man is to mango

go is to mango as stay is to manstay



Punalogy- Bidirectional Approach

Combining analogies :

MANGO -> MAN -> WOMAN -> WOMANGO

MANGO -> GO -> STAY -> MANSTAY

To have (augmentation):

MANGO->MANSTAY->WOMANGO->WOMANSTAY

Method

Analogy solving Unidirectional (given A, C and D, generate B)

1. Generation of A("woman") and C("man") -
Semantic Level (relation of similarity
between A and C)
2. Generation of D("mango") from C("man") -
Morphological Level
3. Generation of an analogy B("womango") -
Morphological Level (Function D)

Analogy solving Bidirectional (given A, C and D, generate B)

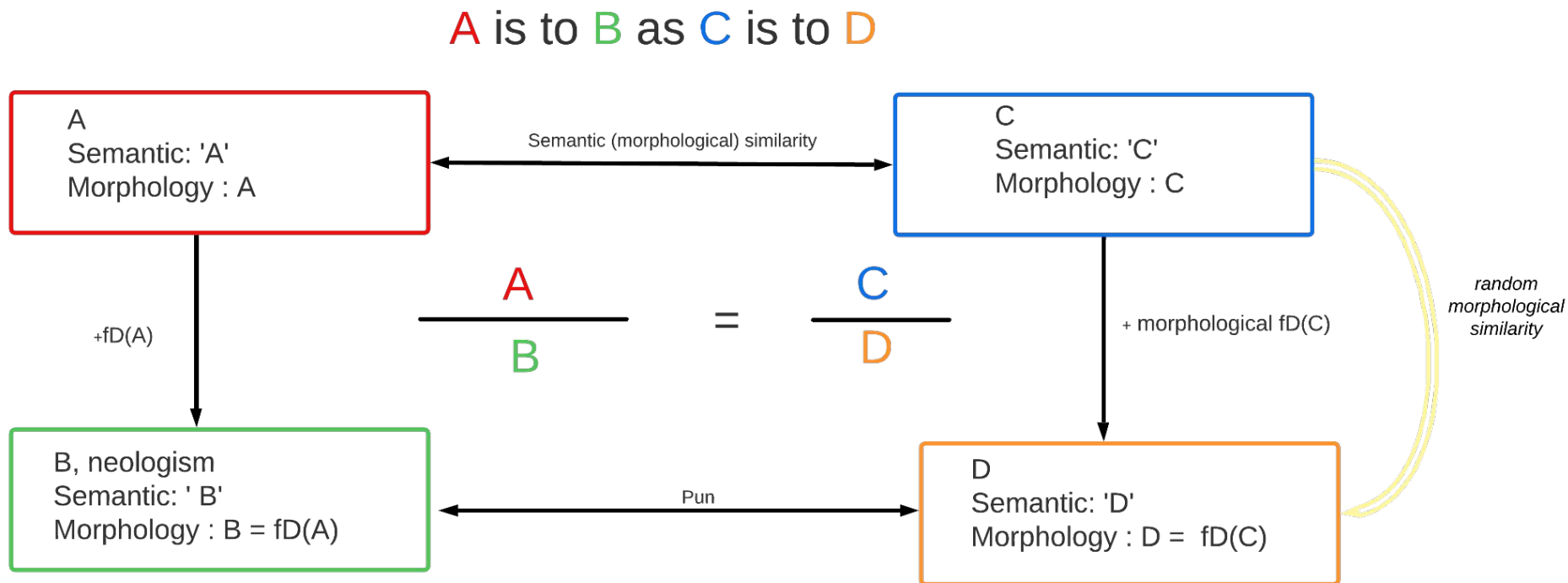
1. Generation of C("man") from D("mango") -
Morphological Level (Function C)
2. Generation of A("woman") - Semantic Level relation
3. Generation of an analogy B("womango") -
Morphological(Reverse Function C)

Or /And

1. Generation of C("go") from A("mango") -
Morphological Level (Function C)
2. Generation of A("stay") - Semantic Level relation
3. Generation of an analogy B("manstay") -
Morphological(Reverse Function C)

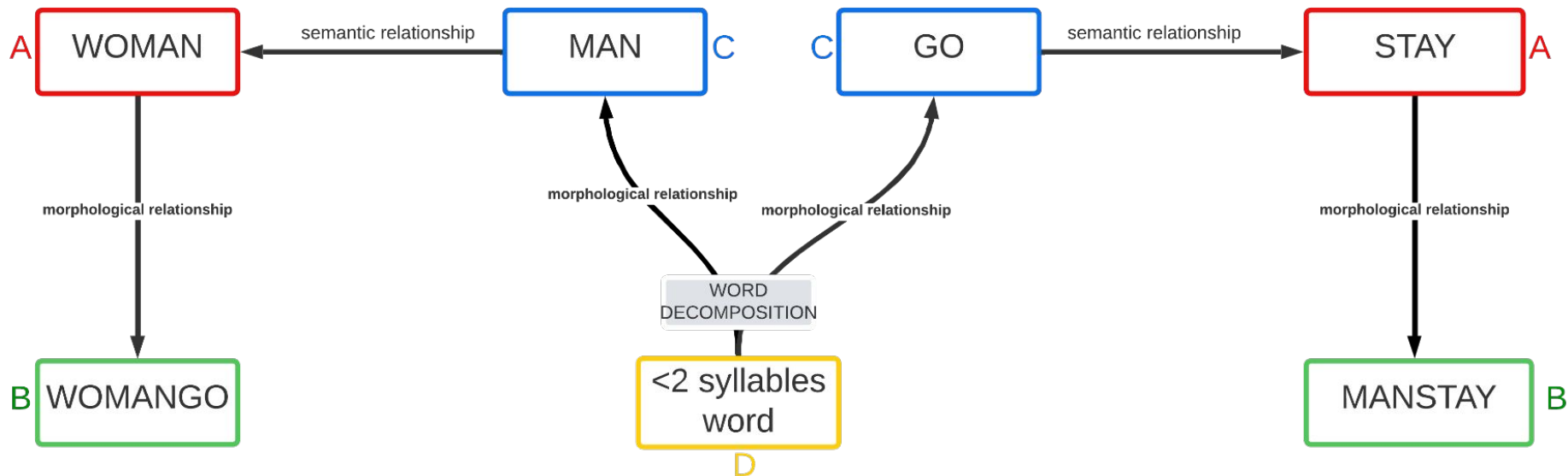
Punalogies-Unidirectional

Task : Analogy solving (given A, C and D, generate B)



Punalogies-Bidirectional

Task : Analogy solving (given A, C and D, generate B)



WOMAN
WOMANGO

=

MAN
MANGO

GO
MANGO

=

STAY
MANSTAY

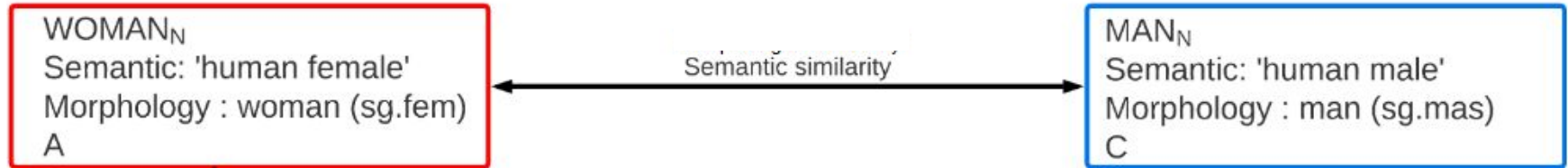
woman is to womango as man is to mango

go is to mango as stay is to manstay

Semantic Level Conception Idea

Playing with Similarity Semantic :

- a. antonym
- b. synonym
- c. (Paronym)
- d. (Homonym)



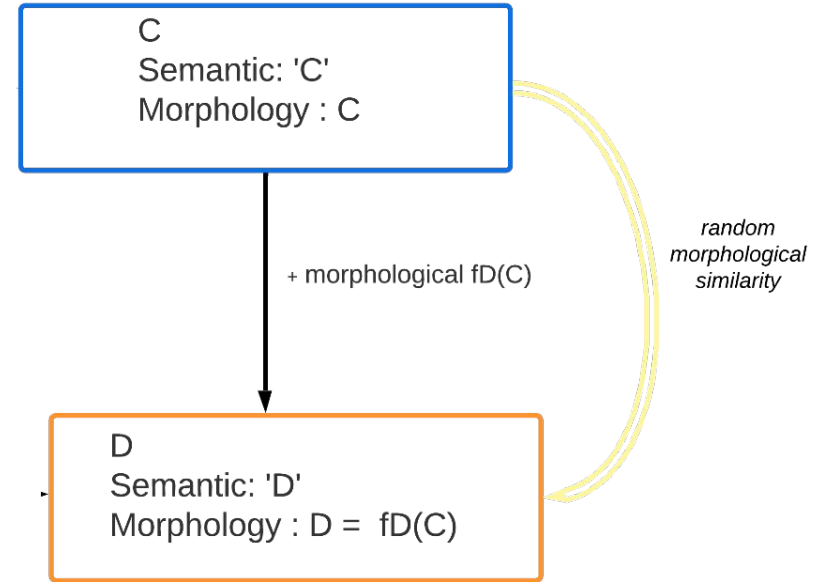
Morphological Level Conception Idea

Selection by Affix

- prefix
- suffix

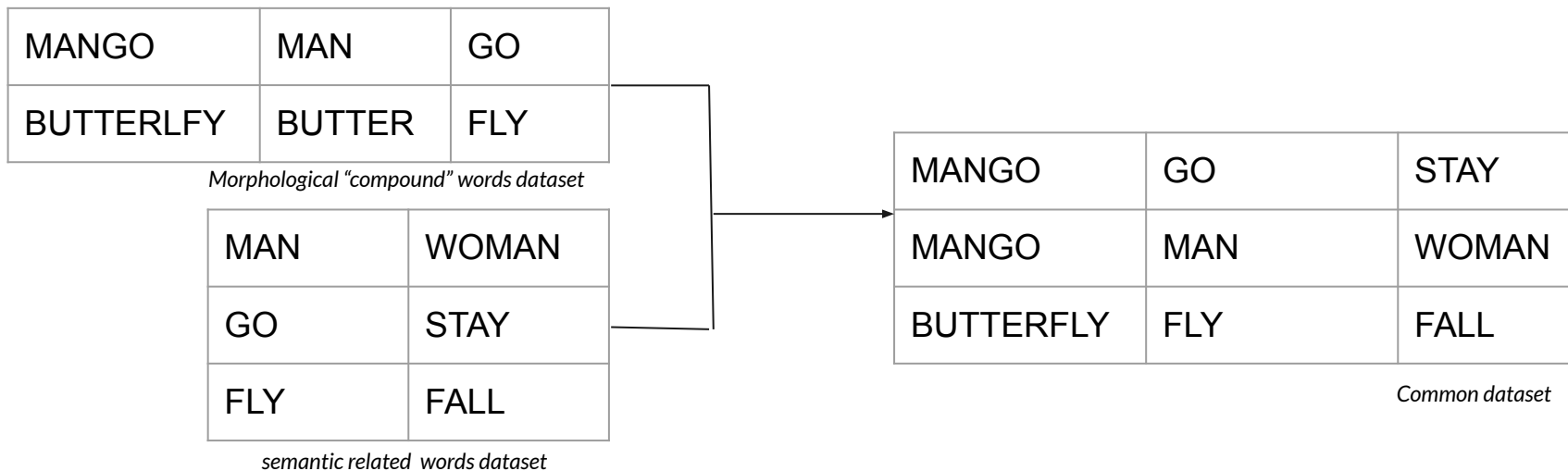
B generation :

- Function $B = fD(A)$
- Reverse Function $B = rfD(A)$



Datasets

- Focus on English analogy
- Selection of special type of words
- Based on semantic similarity pairs (man-woman)
 - > Creation of a common dataset
- Based on morphologic of decomposition of “compound” words (mango-man-go)



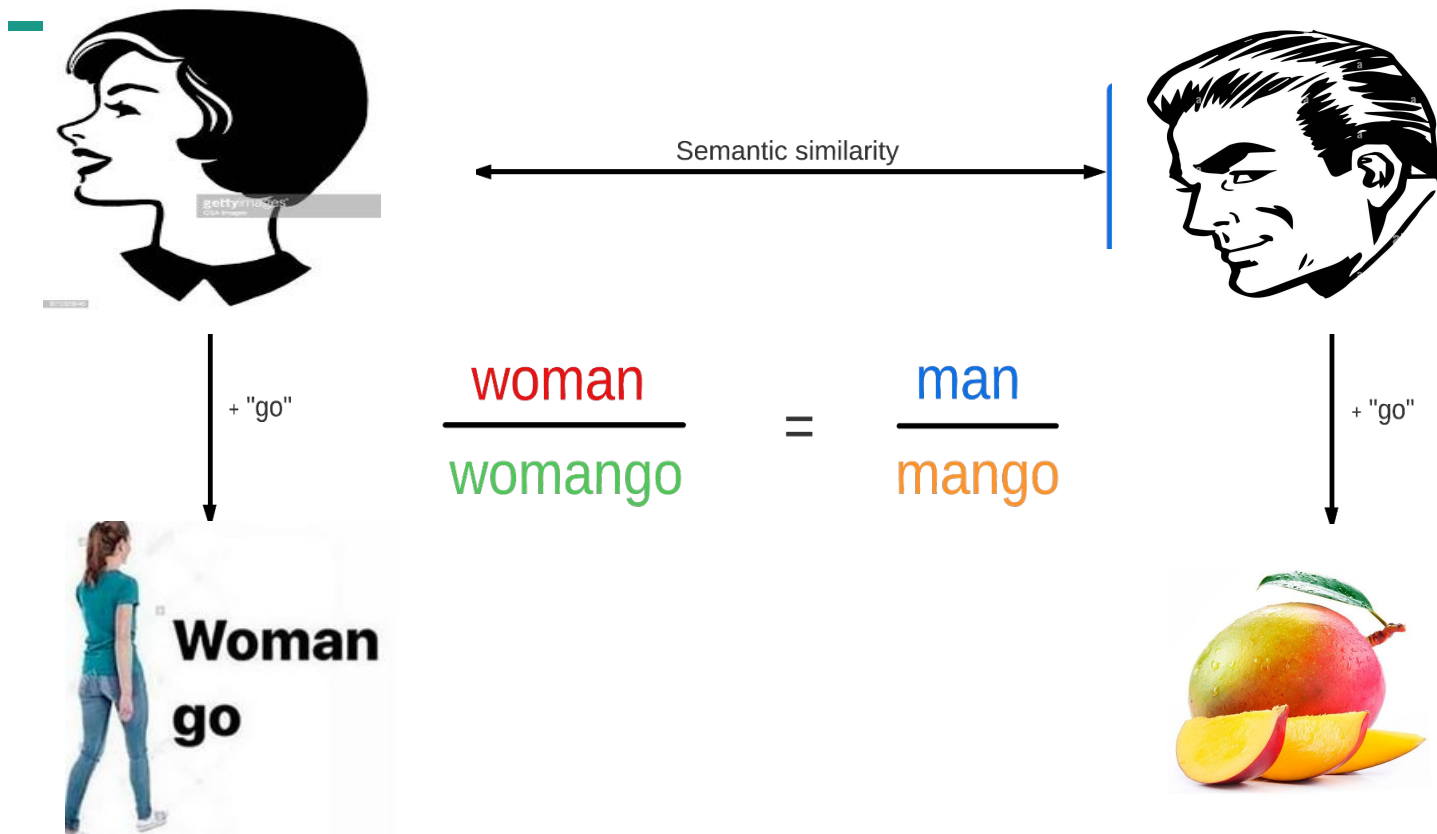
Possible Models Networks:



- **Convolutional Neural Network (CNN):** Using Morphology analogies approach model from Safa Alsaïdi et al. (2021)[1] and Semantic analogies approach model from Lim et al.(2019)[2]
- **Similarity Network Fusion (SNF):** Inspiration of aggregating data types from Bo Wang, A. Mezlin(2014)[3]

Further ideas

Possible addition of images



Futur Ideas (sentence level/ word level)



Organisation

Future work



Tasks:

Research/ Literature survey

Development implementation

Train and test the model

Evaluate the model/results



- Model settings (different approaches)
- Datasets
- Analogy Function
- Embeddings
- Semantic/Morphology similarities

Work in progress

Organisation



Organisation :

- Research
- Development implementation
- Training/Testing
- Final evaluation


Important dates :

- 24/10 : Project Presentation
- 31/10: Supervised Meeting (
- 07/11: Supervised Meeting
- 14/11: Supervised Meeting
- 27/01: Report deadline
- 07/02: Final Project Presentation

Goal:

- Literature survey
- Implementation

References

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- [1] Safa Alsaïdi and al. “A Neural Approach for Detecting Morphological Analogies”. In: The 8th IEEE International Conference on Data Science and Advanced Analytics (DSAA). 2021. url: <https://hal.inria.fr/hal-03313556>
 - [2] S. Lim, H. Prade, and G. Richard, “Solving word analogies: A machine learning perspective,” in 15th EC-SQARU, G. Kern-Isberner and Z. Ognjanovic, Eds., vol. 11726. Belgrade, Serbia: Springer, 2019, pp. 238–250.
 - [3] Bo Wang and al. “Similarity network fusion for aggregating data types on a genomic scale”. In : Nature methods. 2014. url: <http://mgHASSEM.mit.edu/wp-content/uploads/2015/06/nmeth.2810.pdf>



Images

- Alamy Stock Photo
- Getty Images
- <https://starecat.com/woman-stand-woman-go-man-stand-mango-literally-fruit/>