

ASSOCIATIVE **TEXT REPRESENTATION** **AND CORRECTION**

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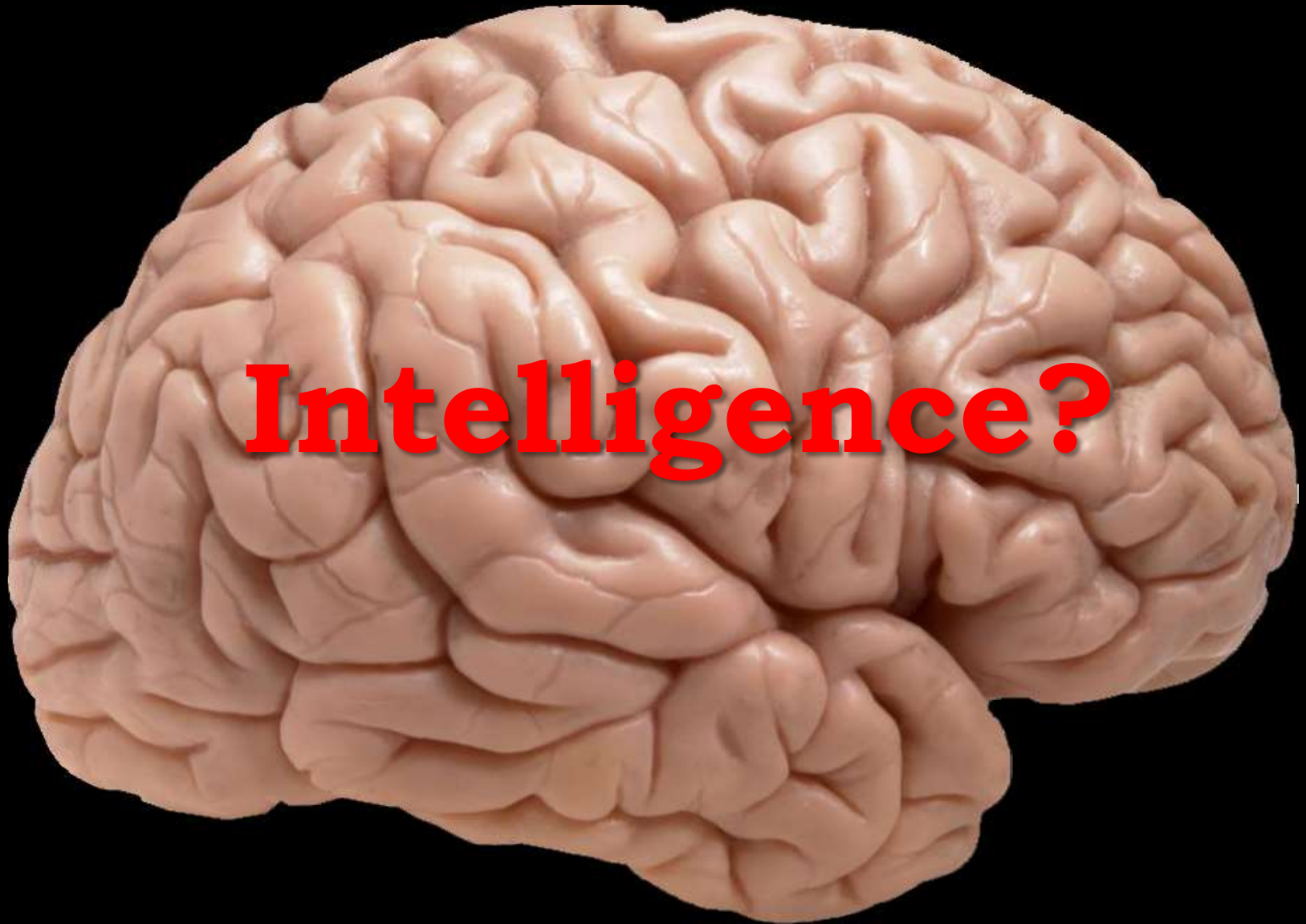
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Let's look inside at



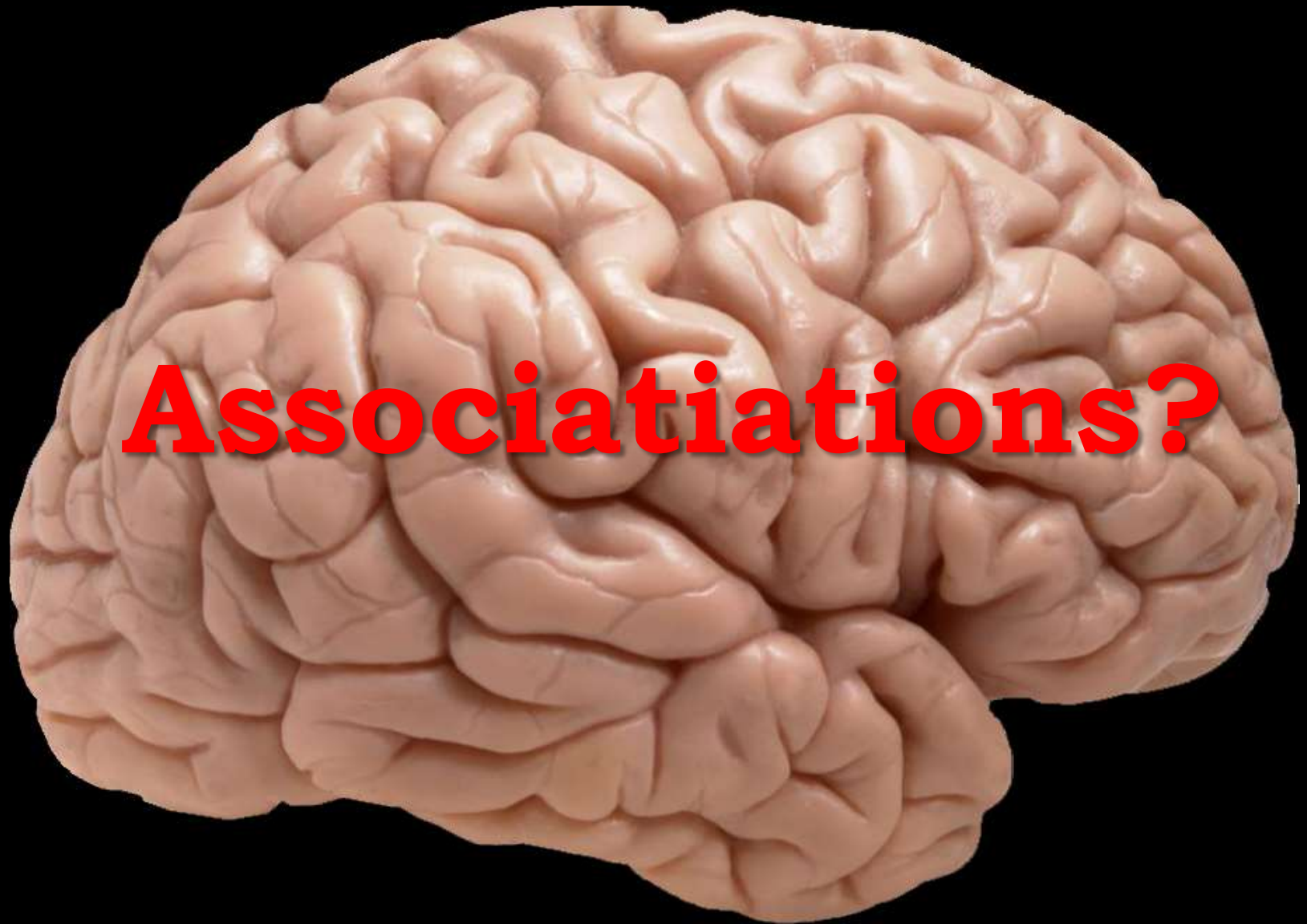
Intelligence?

Let's look inside at



Intelligence?

Let's look inside at



Associations?

ASSOCIATIVE means **EFFICIENT**
EFFICIENT means **INTELLIGENT**

Efficiency of biological data processing
is implicate in **associations**
of **neural** representation
of objects and actions
and also in **active knowledge**
that can be triggered
by activating **them**.

NEURAL REPRESENTATION OF OBJECTS

Neurons can **represent many** various objects.

Objects are represented by various **combinations** of input data spread over time that **activate neurons** as a result of exceeding their thresholds.

This makes them **discriminating** parts of all **combinations**.

Thanks **this discriminative property** neurons can **differentiate** data combinations that **activate neurons** from all others input data combinations.

Activation of neurons lets them **conditionally influence** other neurons that represent the other objects.

Letters and words can be represented by neurons in their **semantic context** of the other words and their sequences.

ASSOCIATIVE NEURAL GRAPHS

are **plastically build** from neurons representing various objects, e.g. letters and words.

Neural representantion of the same objects **is never duplicated** in these graphs.

It lets these graphs **consolidate** representations of objects and **associate** them in various **real contexts**.

These contexts define the **semantics** of them.

ASSOCIATIVE LINGUISTIC NEURAL GRAPHS

represent linguistic objects at the level of the letters and words represented by neurons.

Such **neurons are interconnected** after the letter orders in real words and the word orders in real sentences.

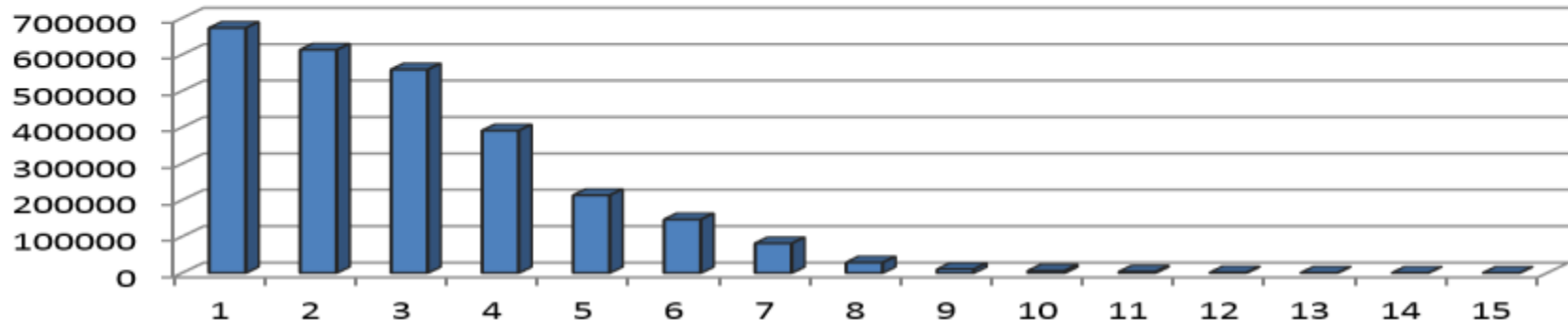
It lets us to **expect** some **common successors** of letters and words accordingly **to the context** of other letters and words taking into account **frequencies** of all subsequences in which they were.

This can be used for **associative semi-automatic contextual text corrections**.

NUMBER OF CONTEXTUAL CONNECTIONS

is maximally limited to the number of words in sentences.

Number of sentences		200	400	2000	4000	>100000
Number of words		2614	11729	25461	50953	961684
Number of letters		11452	52459	115564	231917	4288439
Number of vertices		941	2336	3688	5638	64297
LEVEL OF CONTEXTUAL CONNECTIONS	ASEQ	2423	9289	17969	35184	673338
	ACON-2	1579	7556	16322	35282	613252
	ACON-3	894	6017	13709	28921	558984
	ACON-4	56	1190	3707	8908	391357
	ACON-5		144	1124	3943	213736
	ACON-6		5	322	1787	147010
	ACON-7			28	672	81445
	ACON-8				129	28858
	ACON-9				3	10346
	ACON-10					6242
	ACON-11					3619
	ACON-12					1471
	ACON-13					619
	ACON-14					245
	ACON-15					13



ASSOCIATIVE TEXT CORRECTION

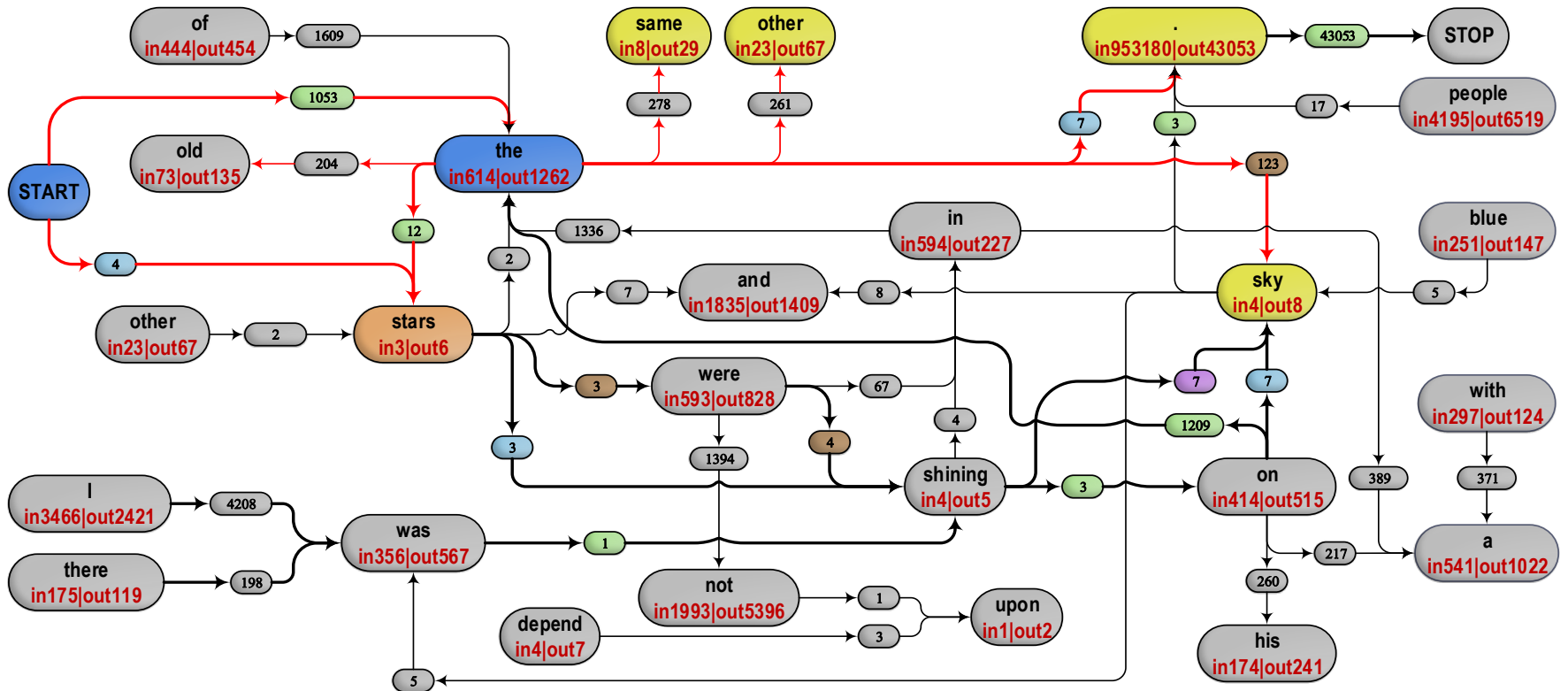
Neurons are stimulated by the read words and through the connections.

CORRECTED TEXT SEQUENCE:

the stars was shining on the sky .

TEXT AFTER CORRECTION:

the stars were shining on the sky .



ASSOCIATIVE TEXT CORRECTION

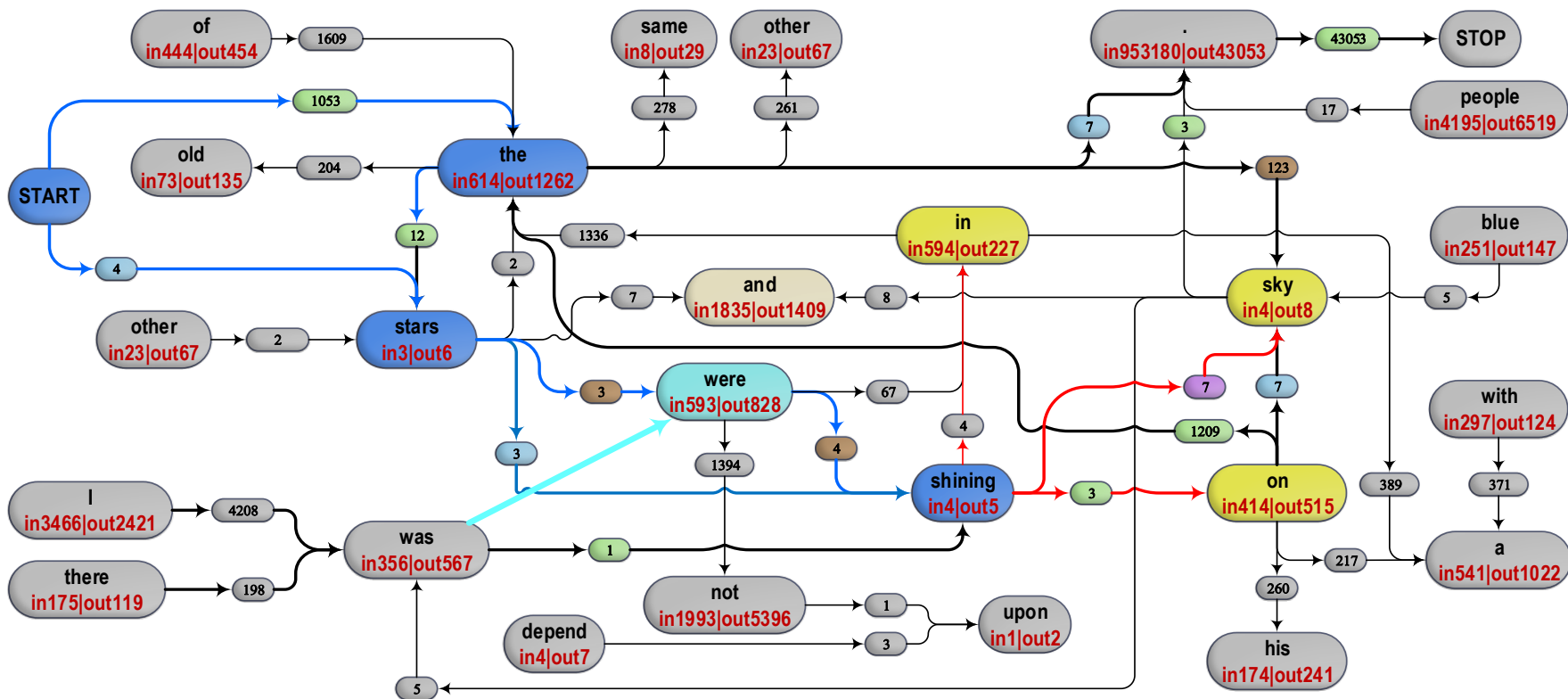
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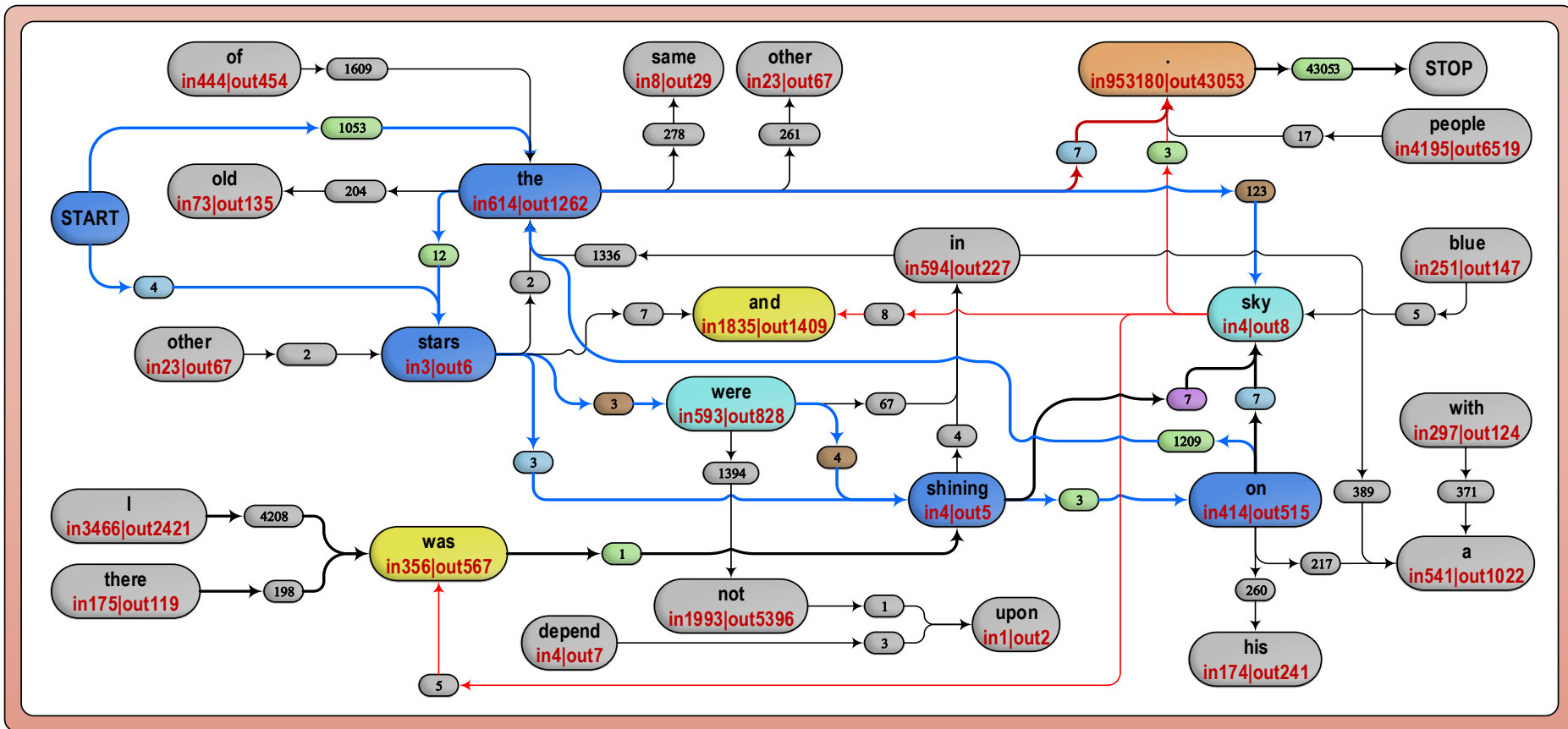
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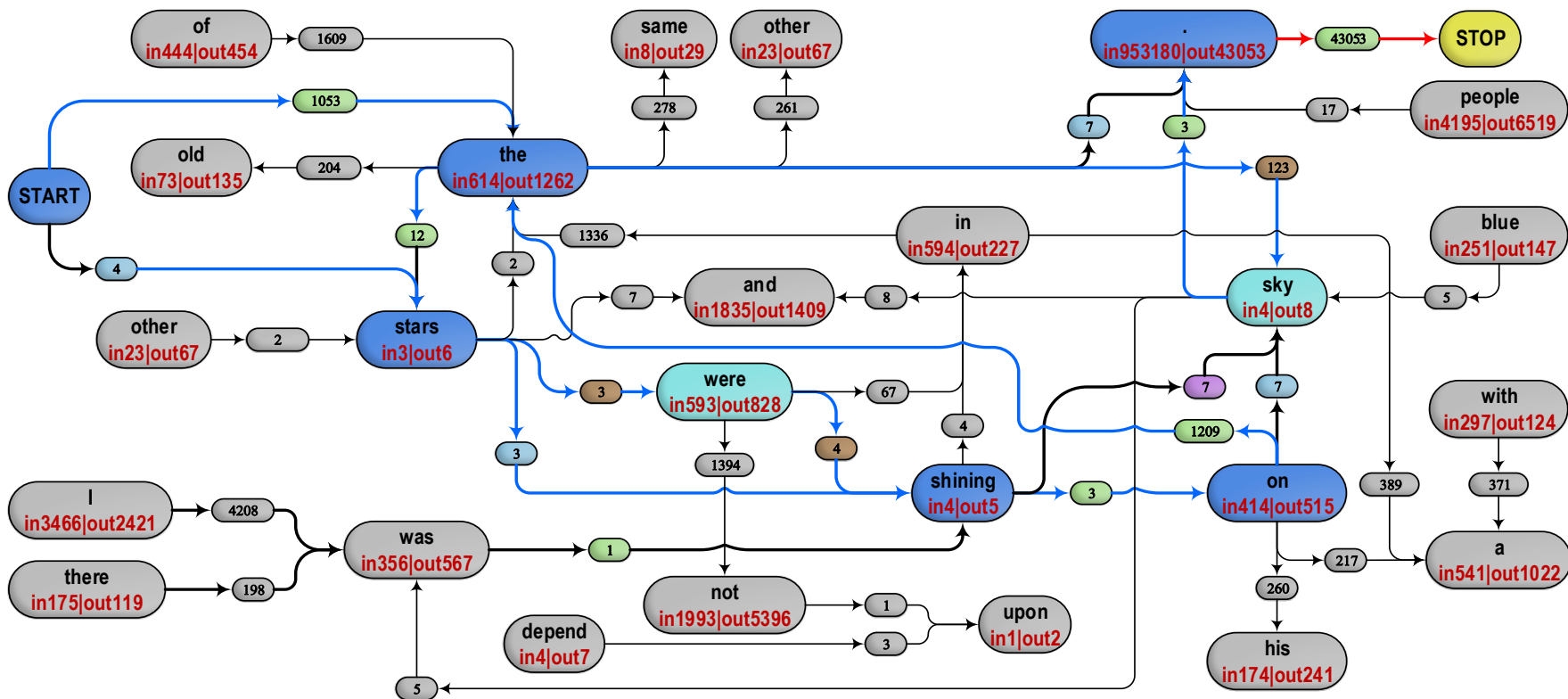
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RESULTS AND CONCLUSIONS

Associative semi-automatic text correction uses a **natural semantic context** for all words in checked and corrected sentences.

Using this kind of **associative graphs** it can **suggest** a few most popular and common corrections after the **linguistic knowledge** formed during reading of many text corpora written by people.

It can **find mistakes** even in sentences constructed from **seemingly correct words** that were used in **improper** context the native speaker will not use.

■ wrong

■ improper

■ inappropriate

■ bad

■ unsuitable

■ objectionable

■ extrinsic

■ unbecoming

■ unseemly

Let's use the power of

Associatiatiion!



QUESTIONS?

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&

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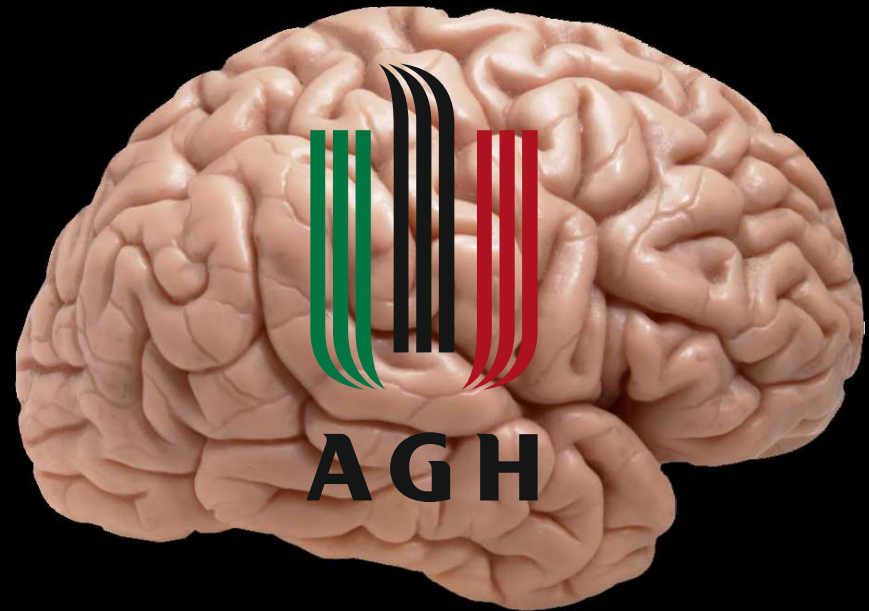
INFORMATYKA

Adrian Horzyk

Sztuczne systemy skojarzeniowe
i asocjacyjna sztuczna inteligencja



Akademicka Oficyna Wydawnicza EXIT
Warszawa 2013



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