

# Semantic Change Characterization with LLMs using Rhetorics

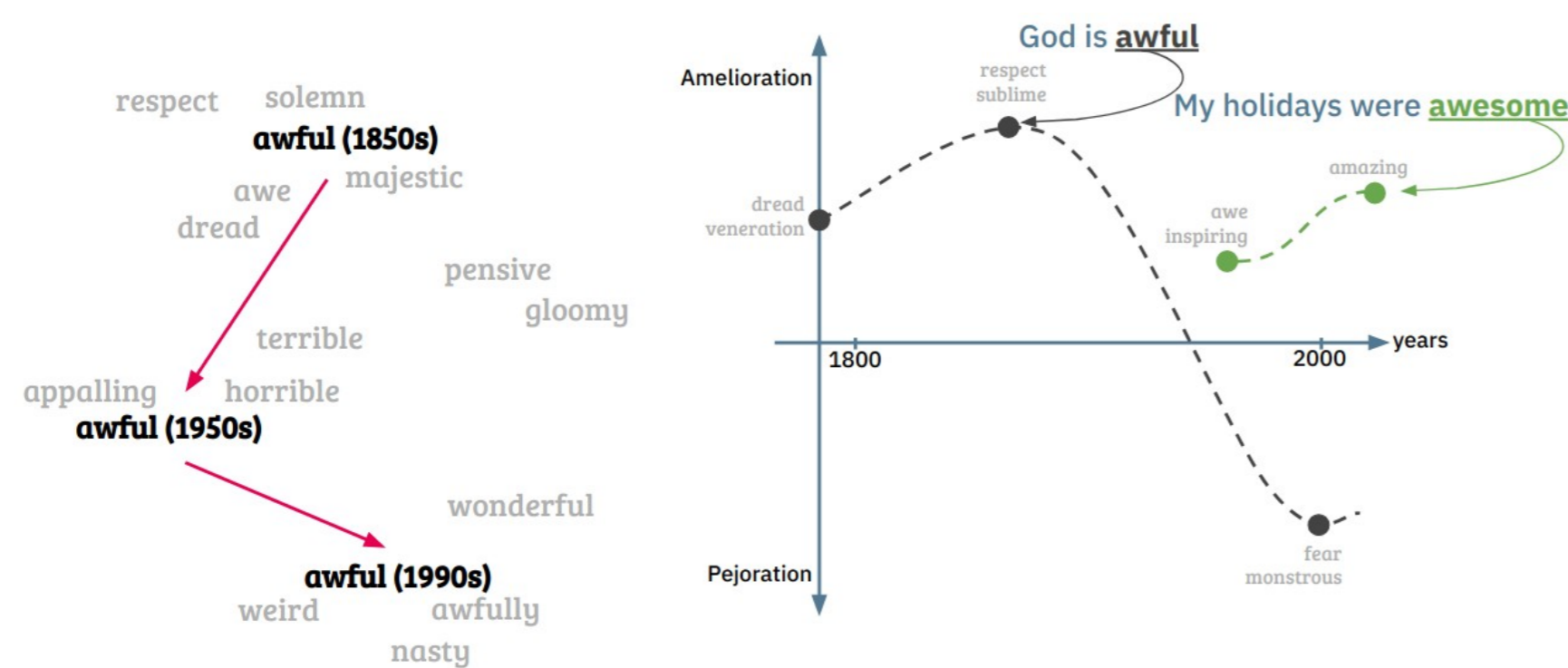
Jader Martins Camboim de Sá, Jooyoung Lee,  
Marcos Da Silveira, Cedric Pruski  
LIST - 5, avenue des Hauts-Fourneaux, L-4362 Esch-sur-Alzette  
Jader.martins@list.lu



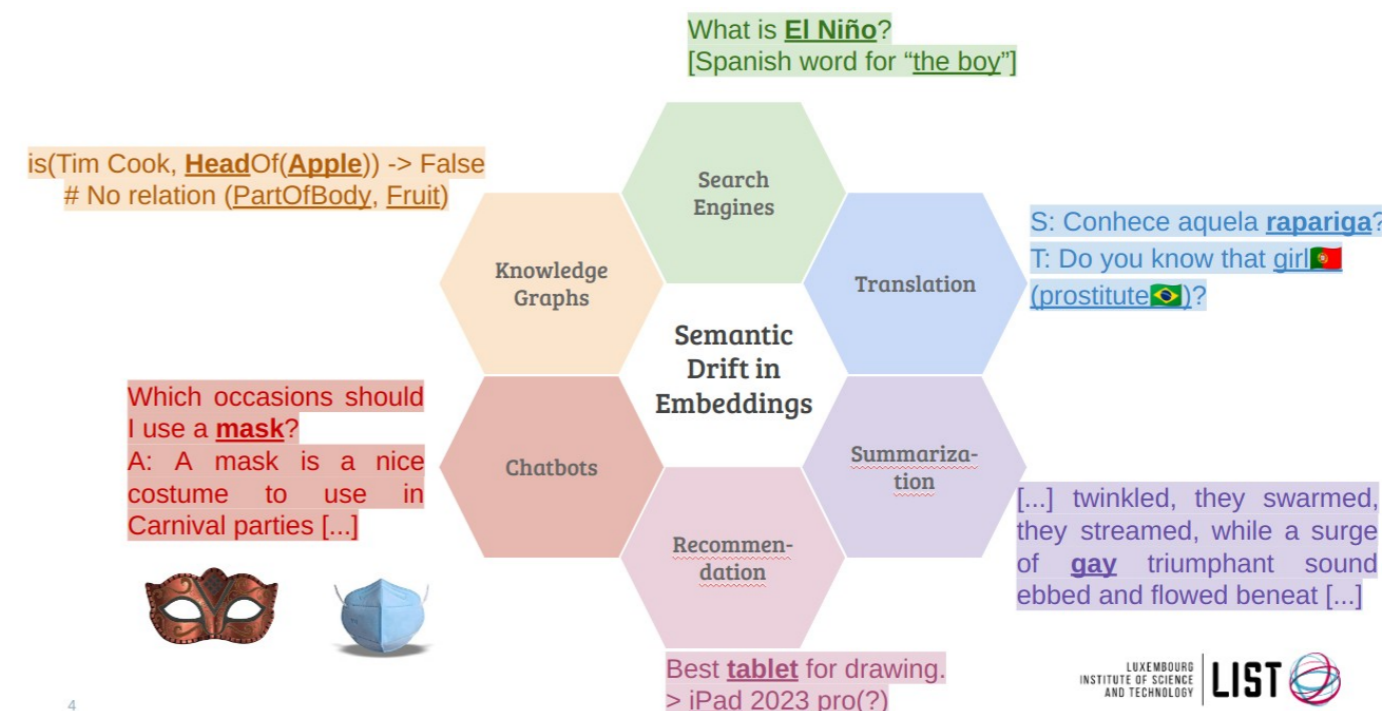
4th year

FACULTY OF SCIENCE, TECHNOLOGY AND MEDICINE

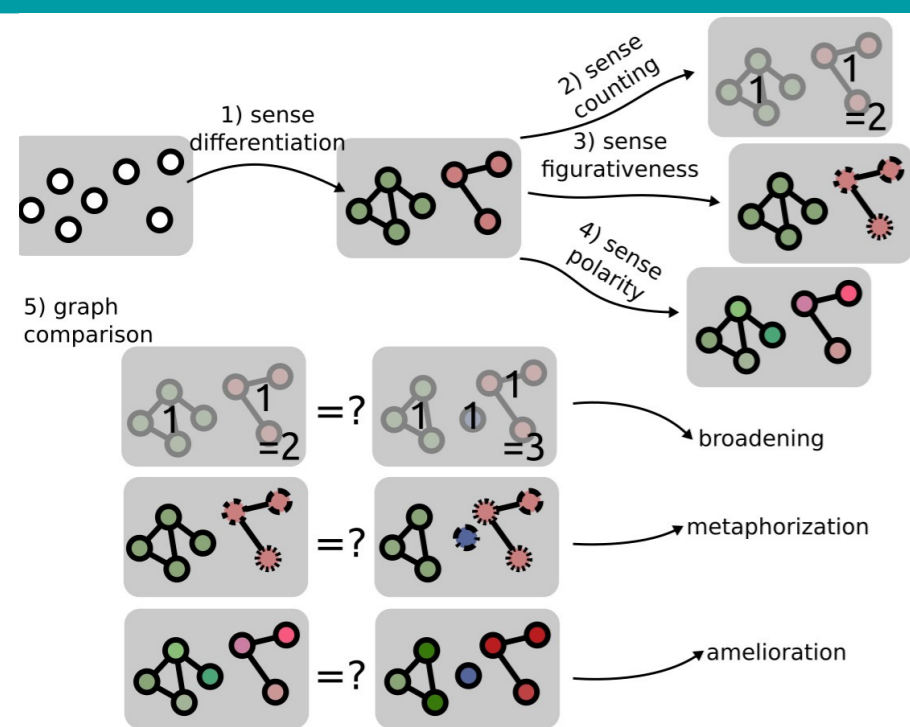
## INTRODUCTION / SCOPE



## OBJECTIVES / HYPOTHESES



## METHODS



This study frames Lexical Semantic Change Characterization as a comparative semantics problem, utilizing Large Language Models (LLMs) as annotators to compare word meanings across distinct contexts. To achieve this, we employ a specialized Chain-of-Thought (CoT) prompting strategy that leverages specific rhetorical devices to elicit step-by-step, "cognitive-appealing" reasoning from the models. The framework analyzes semantic drift across three poles: dimension, relation, and orientation.

## RESULTS

We prompted three state-of-the-art LLMs using rhetorical devices and below we present some of the results generated by prompt guiding.

### Example #54 cup

- He drank a **cup** of coffee.
- He borrowed a **cup** of sugar.

In sentence 1, it is used with the sense of a container. — In sentence 2, it is used with the sense of an amount. — "He drank a cup of sugar." Both sentences use 'cup' with different meanings.

A: different

### Example #167 salt

- She was **salty** because of what happened yesterday.
- She **salts** her lectures with jokes.

In sentence 1, 'salty' is used to describe someone who is angry or upset. — In sentence 2, 'salts' is used to describe the act of adding flavor to something, in this case, a lecture. — I'd rather have a lecture with jokes than be angry or upset. The second sense is more positive.

A: positive

### Example #9 battle

- During the course of this **battle**, four Canadian soldiers were wounded.
- I call on him not to let the **battle** of hierarchies within the directorates-general prevent this from being implemented.

In the first sentence, 'battle' is used literally, referring to a fight or conflict. — In the second sentence, 'battle' is used metaphorically to represent a struggle or conflict between different groups or factions. — The word 'battle' is related to the first sentence as a metaphor.

A: metaphor

Method	LLaMA-3-8b	LLaMA-3-70b	Phi-3
Few-Shot	<b>.75±.00</b>	.76±.00	.60±.00
CoT	.59±.02	.75±.02	.62±.01
Rhetoric (ours)	.68±.03	<b>.78±.01</b>	<b>.71±.02</b>

Table 3: Accuracy metrics for the Dimension dataset.

Method	LLaMA-3-8b	LLaMA-3-70b	Phi-3
Few-Shot	.38±.00	.52±.00	.49±.00
CoT	.45±.01	.53±.01	.51±.03
Rhetoric (ours)	<b>.52±.02</b>	<b>.59±.02</b>	<b>.56±.01</b>

Table 4: Accuracy metrics for the Relation dataset.

Method	LLaMA-3-8b	LLaMA-3-70b	Phi-3
Few-Shot	<b>.37±.00</b>	.36±.00	.30±.00
CoT	.34±.03	.35±.00	.30±.02
Rhetoric (ours)	<b>.37±.03</b>	<b>.39±.01</b>	<b>.40±.02</b>

Table 5: Accuracy metrics for the Orientation dataset.

## CONCLUSIONS

We experimentally observed that rhetorical devices can help LLMs to mimic human meaning associations, enabling semantic change characterization. In future works, we expect to explore in depth if LLMs can produce new rhetoric associations or if it's just reproducing its training data, this task can be investigate through non conventionalized metaphor or circumstantial metonymy.

## REFERENCES

- [1] Petroni, Fabio, et al. "Language Models as Knowledge Bases?"
- [2] Wei, Jason et al. "Chain of Thought Prompting Elicits Reasoning in Large Language Models."
- [3] Huang, Lei et al. "A Survey on Hallucination in Large Language Models: Principles, Taxonomy, Challenges, and Open Questions."

## ACKNOWLEDGEMENTS

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