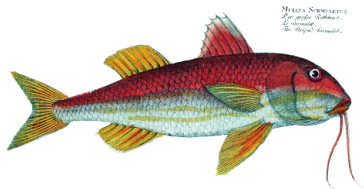


# MULLE for Latin: Computer-Generated Translation Exercises for Latin

Herbert Lange

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MUSTE = Multi(modal|lingual) S(emantics|yntax) in Text Editing  
MULLE = MUSTE Language Learning Environment



### Challenges in teaching Latin

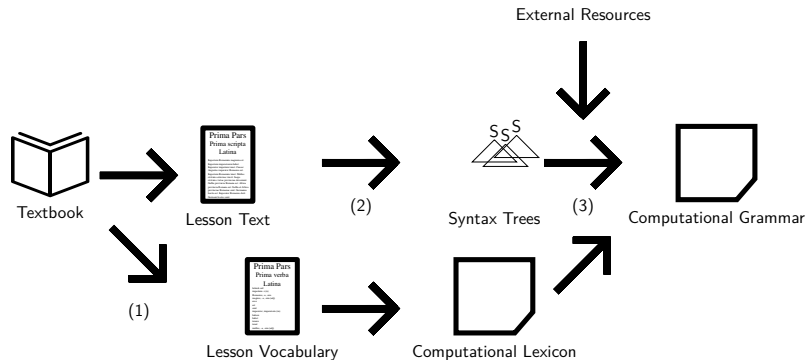
- ▶ High level of linguistic complexity (strongly inflecting, free word order)
- ▶ Only as foreign language
- ▶ Mostly translation competence
- ▶ Usually not considered “fun”, sometimes even causes anxiety

Gamification for Latin learning

## Application Design

- ▶ Lessons: Bi-/multi-lingual grammar and a set of exercises
- ▶ Exercise: Pair of sentences in different languages
- ▶ Solve all Exercises in a Lesson to pass it
- ▶ Change one sentence to make it a proper translation of the other to solve Exercise
- ▶ User interaction always leads to grammatical sentences

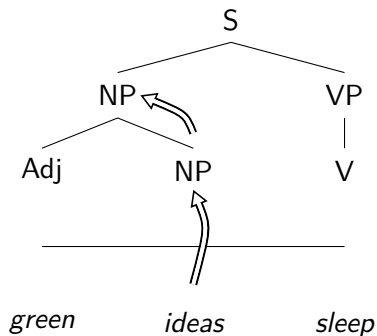
# Lesson Creation



## Implementation Details

- ▶ Sentences give rise to a set of syntax trees
- ▶ User interaction on the surface mapped onto tree operations on these syntax trees (insert, delete, replace)
- ▶ Two sentences are proper translation of each other if the intersection of the sets is non-empty

## User Interaction



Syntax Tree

*green*      *ideas*      *sleep*      Surface String

↑  
User

NP  
colorless green ideas

NP  
green books

NP  
ideas



GameFlow (Sweetser and Wyeth 2005):

- ▶ Concentration
- ▶ Challenge
- ▶ Control
- ▶ Clear Goals
- ▶ Immediate feedback

Demo

## Conclusion

- ▶ Interactive, playful and game-like access to translating Latin sentences as a web application
- ▶ System suitable for historic languages (data sparseness, integration in existing classes)
- ▶ Grammar design controls both learning outcome and methods of teaching, high level of variety within the material
- ▶ Keep Language teachers in the loop (and make the work as easy as possible for them)

## Future work

- ▶ Additional Exercise Types
- ▶ Improvements in Lesson/Grammar design
- ▶ Improvement of Exercise generation
- ▶ (Full, Empirical) Evaluation

# Main References



UNIVERSITY OF GOTHENBURG

## Computer-Assisted Language Learning with Grammars

A Case Study on Latin Learning

*Herbert Lange*



**Licentiate thesis**

Department of Computer Science and Engineering  
University of Gothenburg, Sweden 2018

<https://gup.ub.gu.se/file/207536>

Free and Open Source:

<https://github.com/MUSTE-Project/>



8th NLP4CALL

NoDaLiDa workshop, Turku, Finland, September 30 2019