The LiLa Knowledge Base in a Nutshell

The LiLa Team

UNIVERSITÀ CATTOLICA del Sacro Cuore

IRCSE

LiLa Tutorial

2nd International Conference of the European Association for Digital Humanities (EADH 2021)

Krasnoyarsk, Russia, 21 - 25 September 2021

This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme - Grant Agreement No. 769994.

Overview

Introduction and fundamentals

- LiLa: mission and architecture

LiLa now!

- Lemma Bank and Lexical Resources
- Textual Resources
- Text Linker
- To sum up

Tutorial

- What, How and Who
- Programme & Communication Tools

Table of Contents

Introduction and fundamentals
- LiLa: mission and architecture

LiLa now!
- Lemma Bank and Lexical Resources
- Textual Resources
- Text Linker
- To sum up

Tutorial
- What, How and Who
- Programme & Communication Tools

Research question
State of affairs

We have built and collected (for Latin and other languages):

Research question
State of affairs

We have built and collected (for Latin and other languages):

- Textual Resources

Research question
State of affairs

We have built and collected (for Latin and other languages):

- Textual Resources
- Lexical Resources

Research question
State of affairs

We have built and collected (for Latin and other languages):

- Textual Resources
- Lexical Resources
- NLP Tools

Research question
State of affairs

We have built and collected (for Latin and other languages):

- Textual Resources
- Lexical Resources
- NLP Tools

Scattered and unconnected

ERC Consolidator Grant 2018-2023

A collection of multifarious, interoperable linguistic resources described with the same vocabulary for knowledge description (by using common data categories and ontologies)

Interlinking as a Form of Interaction

CLARIN
Common Language Resources and Technology Infrastructure

Infrastructure

Interoperability

The Linked Data Principles

…just to be FAIR

The Linked Data Principles
…just to be FAIR

- Use URIs for things (e.g. an entry in a lexicon, a token in a corpus)

The Linked Data Principles

…just to be FAIR

- Use URIs for things (e.g. an entry in a lexicon, a token in a corpus)
- Use HTTP URIs to allow people (and machines) to look up things

The Linked Data Principles
…just to be FAIR

- Use URIs for things (e.g. an entry in a lexicon, a token in a corpus)
- Use HTTP URIs to allow people (and machines) to look up things
- Use web standards to represent/query (meta)data, such as RDF and SPARQL

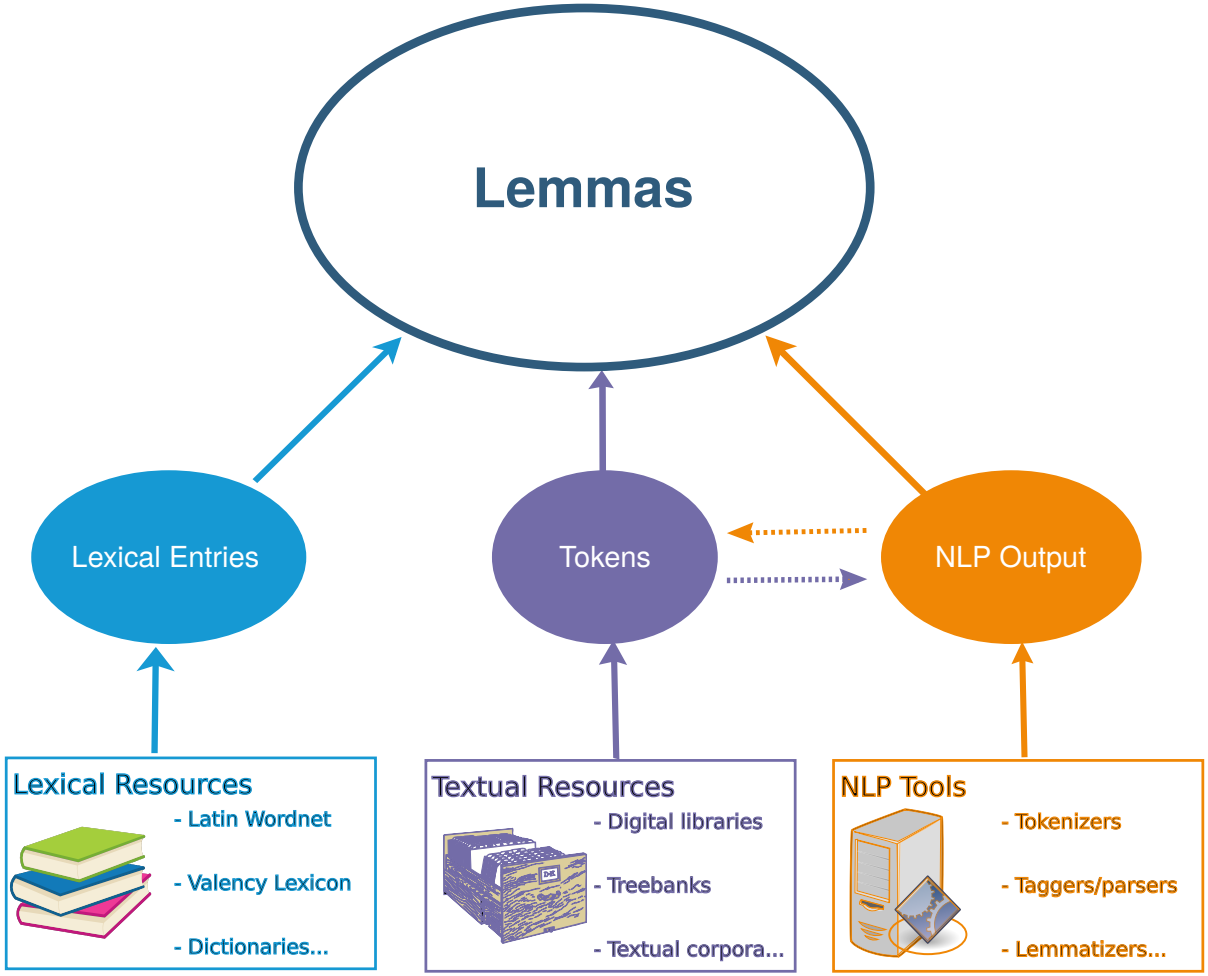
The Linked Data Principles

…just to be FAIR

- Use URIs for things (e.g. an entry in a lexicon, a token in a corpus)
- Use HTTP URIs to allow people (and machines) to look up things
- Use web standards to represent/query (meta)data, such as RDF and SPARQL
- Include links to other URIs

LiLa Knowledge Base

Lexically-based architecture and (meta)data sources



LiLa reflects the annotation granularity of the resources it connects

No data enrichment or further analysis is performed
…but we can help you to enrich your (meta)data

To enter the LiLa Knowledge Base, a textual/lexical resource must be:

To enter the LiLa Knowledge Base, a textual/lexical resource must be:

- Lemmatised

To enter the LiLa Knowledge Base, a textual/lexical resource must be:

- Lemmatised
- Part-of-Speech tagged (ideally, using the Universal Dependencies tagset)

To enter the LiLa Knowledge Base, a textual/lexical resource must be:

- Lemmatised
- Part-of-Speech tagged (ideally, using the Universal Dependencies tagset)
- Online!

Table of Contents

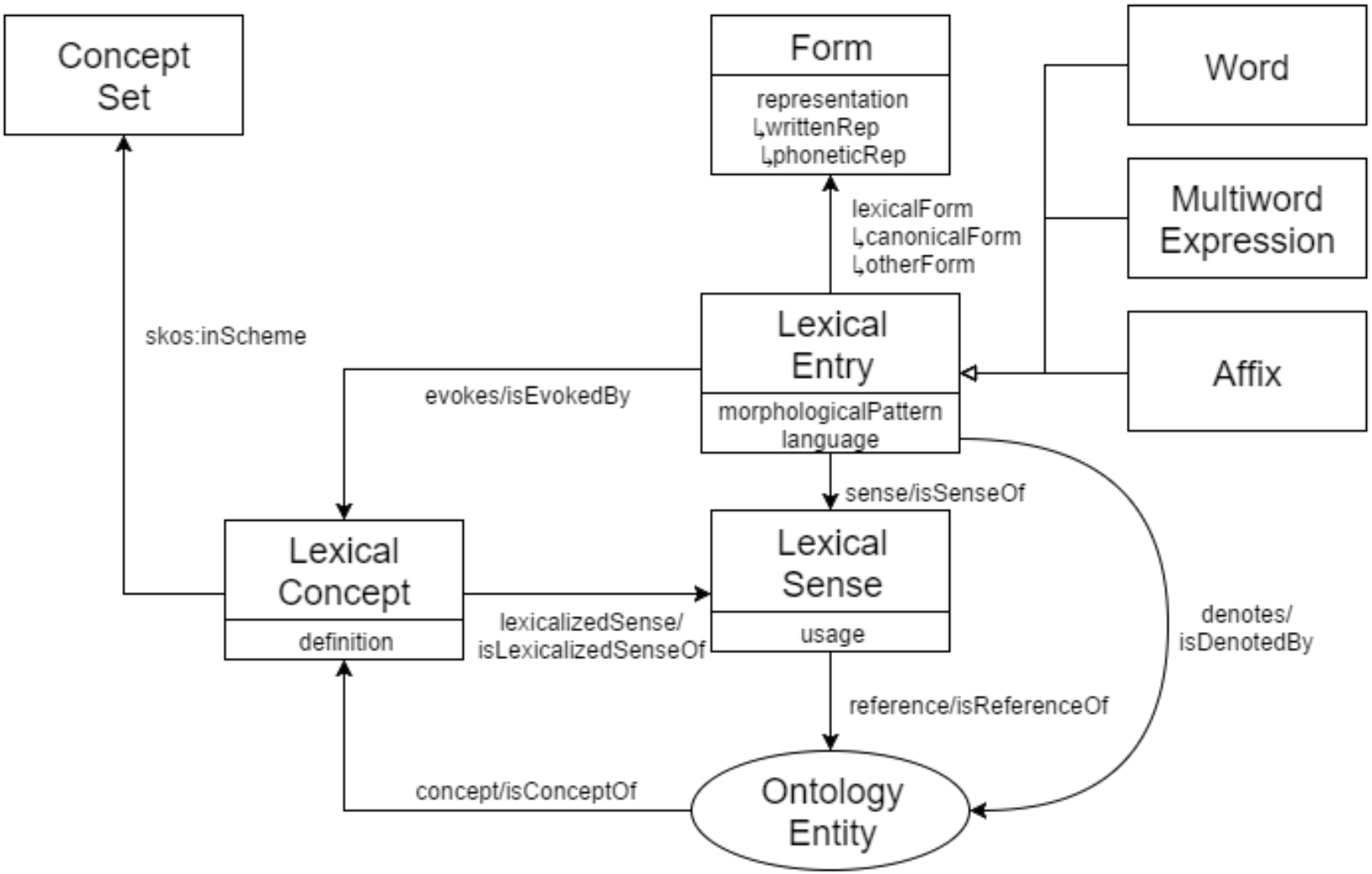
Introduction and fundamentals
- LiLa: mission and architecture

LiLa now!
- Lemma Bank and Lexical Resources
- Textual Resources
- Text Linker
- To sum up

Tutorial
- What, How and Who
- Programme & Communication Tools

LiLa and Ontolex Lemon

A *de facto* W3C standard for publishing lexical data as LLOD



Lemma Bank and Lexical Resources

The core of LiLa. Source: LEMLAT (extended)

Lemma *admiror* ‘to admire, to respect’

`http://lila-erc.eu/data/id/lemma/87541`

- Lemma Bank
- A derivational lexicon (Word Formation Latin)
- A polarity lexicon (LatinAffectus)
- An etymological dictionary (De Vaan)
- A Valency Lexicon (Latin Vallex)
- A manually checked subset of the Latin WordNet

Table of Contents

Introduction and fundamentals
- LiLa: mission and architecture

LiLa now!
- Lemma Bank and Lexical Resources
- Textual Resources
- Text Linker
- To sum up

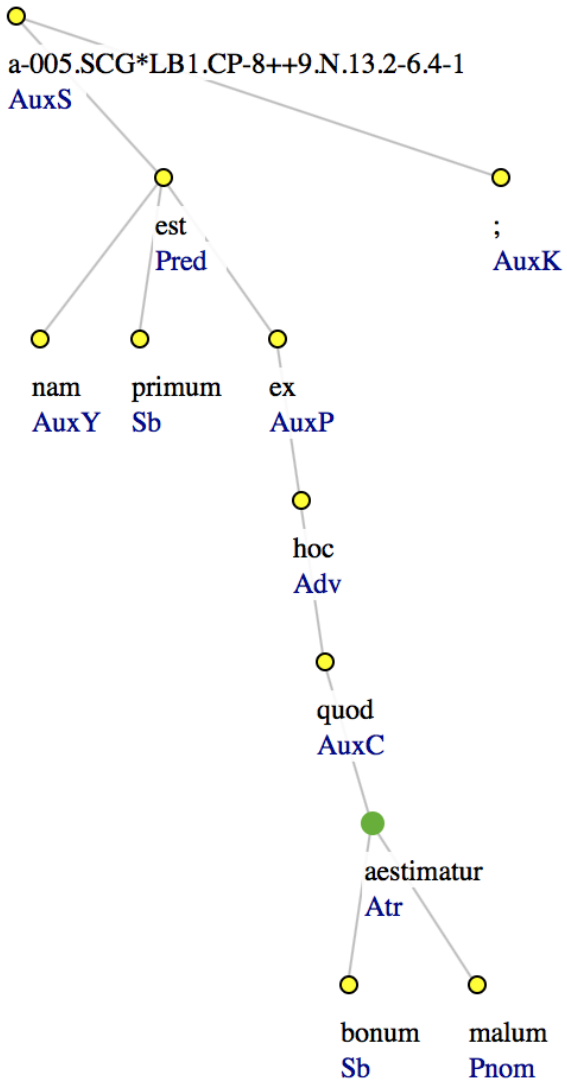
Tutorial
- What, How and Who
- Programme & Communication Tools

(Annotated) Corpora in LiLa

Source: The *Index Thomisticus* Treebank (original scheme)

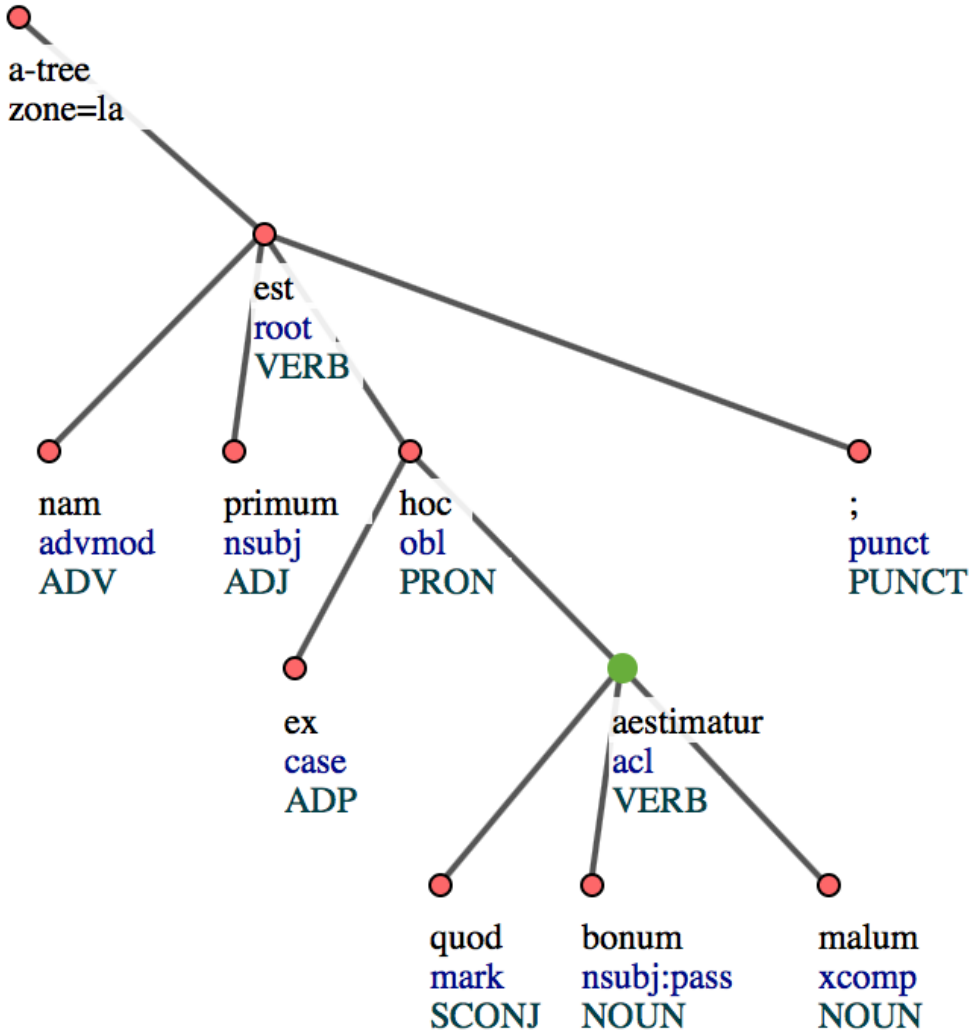
nam primum est ex hoc quod bonum ***aestimatur*** *malum*; (IT-TB: SCG, lib. 1, cap. 89, n. 13)

for the first arises because the good ***is judged*** *to be evil*; (Trans. Anton C. Pegis)



(Annotated) Corpora in LiLa

Source: The *Index Thomisticus* Treebank (UD scheme)



Token *aestimatur*

http://lila-erc.eu/lodview/data/corpora/ITTB/id/token/005.SCG*LB1.CP-8++9.N.13.2-6.4-1W8

Table of Contents

Introduction and fundamentals
- LiLa: mission and architecture

LiLa now!
- Lemma Bank and Lexical Resources
- Textual Resources
- Text Linker
- To sum up

Tutorial
- What, How and Who
- Programme & Communication Tools

TextLinker

Welcome screen

Figure: LiLa's Text Linker

TextLinker
Processed output

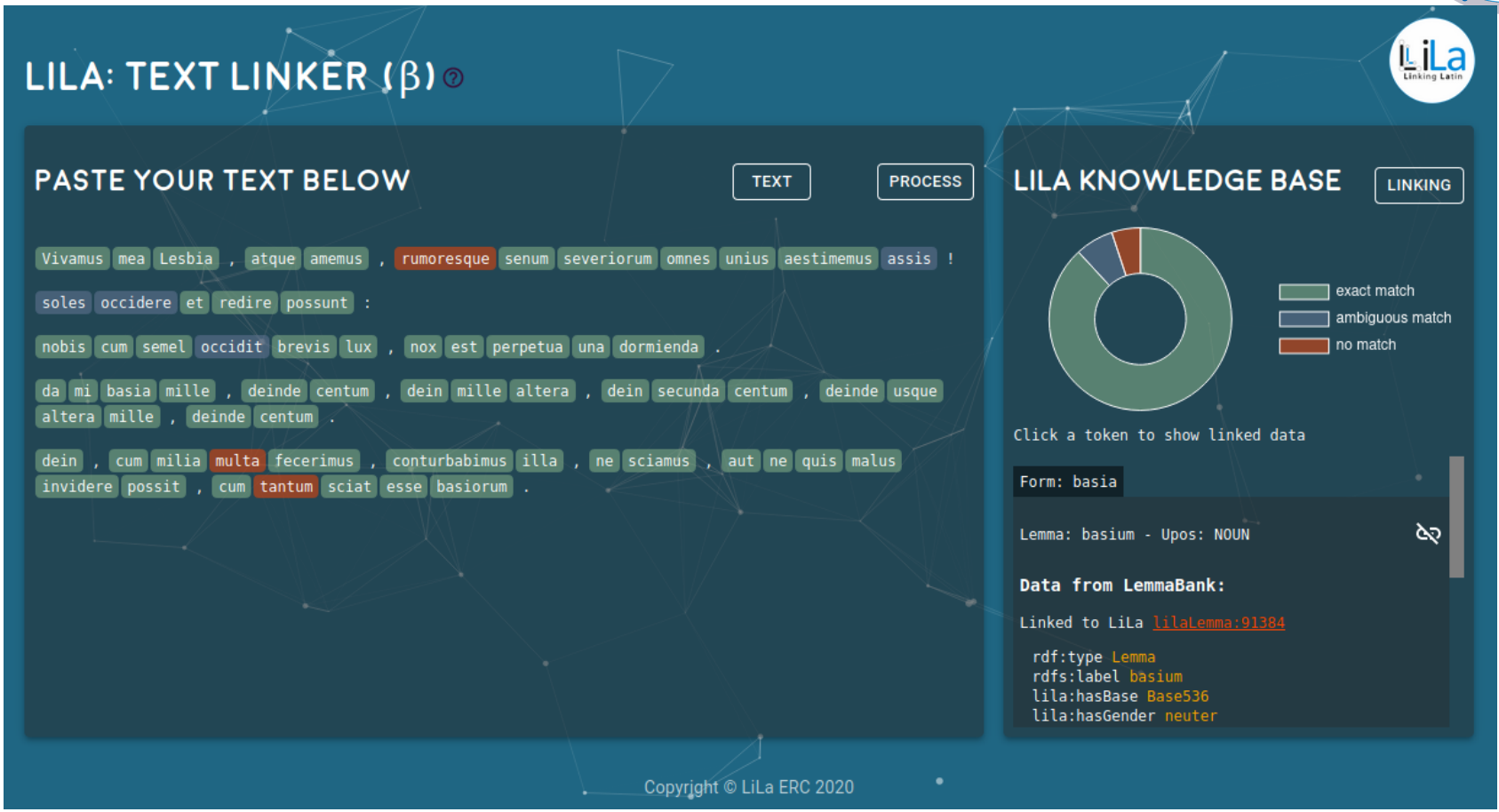


Figure: Text processed against the LiLa Knowledge Base

http://lila-erc.eu:8080/LiLaTextLinker/

Table of Contents

Introduction and fundamentals
- LiLa: mission and architecture

LiLa now!
- Lemma Bank and Lexical Resources
- Textual Resources
- Text Linker
- To sum up

Tutorial
- What, How and Who
- Programme & Communication Tools

LiLa: Overview

Resources connected and upcoming connections

- **Corpora**
  - [x] Index Thomisticus Treebank (*Summa contra Gentiles*): ca. 450,000 nodes
  - [x] Dante Search (700th death anniversary): ca. 46,000 tokens
  - [x] *Querolus sive Aulularia*: ca. 17,000 tokens
  - [ ] PROIEL and LLCT treebanks
  - [ ] Computational Historical Semantics, LASLA and CroALa Corpora
- **Lexica**
  - [x] Word Formation Latin: ca. 46,000 lemmas (Classical Latin)
  - [x] Etymological dictionary of Latin & the other Italic Langs.: ca. 1,400 entries
  - [x] LatinAffectus: ca. 2,300 entries
  - [x] Index Graecorum Vocabulorum in Linguam Latinam: ca. 1,800 entries
  - [x] Latin WordNet: ca. 1,000 manually checked entries
  - [x] Latin Vallex 2.0: Valency Lexicon
  - [ ] Lewis & Short Dictionary
- **NLP tools**
  - [x] LEMLAT (lemma bank): ca. 150,000 lemmas
- **TOTAL: approximately 13 million triples**

Query Interface, Triplestore and Linker

- Query interface; Triplestore
- Linker

Linguistic Resources. Corpora

- Index Thomisticus Treebank
- Dante Search
- *Querolus sive Aulularia*

Linguistic Resources. Lexica

- Word Formation Latin
- Etymological Dictionary of Latin & the Other Italic Languages
- LatinAffectus
- Index Graecorum Vocabulorum in Linguam Latinam
- Latin WordNet
- Latin Vallex 2.0

Table of Contents

Introduction and fundamentals
- LiLa: mission and architecture

LiLa now!
- Lemma Bank and Lexical Resources
- Textual Resources
- Text Linker
- To sum up

Tutorial
- What, How and Who
- Programme & Communication Tools

- **WHAT**: to show the workflow we employ to connect a linguistic resource for Latin to the LiLa Knowledge Base, and to demonstrate the way in which LiLa can be queried.

- **WHAT**: to show the workflow we employ to connect a linguistic resource for Latin to the LiLa Knowledge Base, and to demonstrate the way in which LiLa can be queried.
- **HOW**: to teach participants how to perform automatic lemmatisation and RDF-isation (i.e. format conversion) in order to link a Latin text to LiLa.

- **WHAT**: to show the workflow we employ to connect a linguistic resource for Latin to the LiLa Knowledge Base, and to demonstrate the way in which LiLa can be queried.
- **HOW**: to teach participants how to perform automatic lemmatisation and RDF-isation (i.e. format conversion) in order to link a Latin text to LiLa.
- **WHO-1**: anyone who wishes to publish Latin texts on the web.

- **WHAT**: to show the workflow we employ to connect a linguistic resource for Latin to the LiLa Knowledge Base, and to demonstrate the way in which LiLa can be queried.
- **HOW**: to teach participants how to perform automatic lemmatisation and RDF-isation (i.e. format conversion) in order to link a Latin text to LiLa.
- **WHO-1**: anyone who wishes to publish Latin texts on the web.
- **WHO-2**: anyone interested in the different aspects involved in the construction of a Linguistic Linked Open Data knowledge base.

Table of Contents

Introduction and fundamentals
- LiLa: mission and architecture

LiLa now!
- Lemma Bank and Lexical Resources
- Textual Resources
- Text Linker
- To sum up

Tutorial
- What, How and Who
- Programme & Communication Tools

Programme & Communication Tools

Programme (CET)

- 9:00-10:30: Introduction, quiz
- 10:30-10:45: break
- 10:45-13:00: Hands-on work (test on Horace, *Carmina* 1), Q&A

other breaks agreed together as the activity progresses

Tools

- Chat/Raise hand on Teams: for quick help
- Google Drive: for collaborative note-taking: `https://tinyurl.com/e4upvykb`

Useful Links

- Repository for the tutorial: `https://github.com/CIRCSE/Tutorials/tree/main/EADH2021`
- Collaborative notebook: `https://tinyurl.com/e4upvykb`
- TextLinker (**!!Beta Version!!**): `http://lila-erc.eu:8080/LiLaTextLinker/`
- Repository of SPARQL queries: `https://github.com/CIRCSE/SPARQL-queries`
- LiLa Lemma Bank query interface: `https://lila-erc.eu/query/`
- LiLa SPARQL interface: `https://lila-erc.eu/sparql/`

Thanks!
Get in touch

LiLa: Linking Latin
Università Cattolica del Sacro Cuore
CIRCSE Research Centre

info@lila-erc.eu

https://github.com/CIRCSE

https://lila-erc.eu

@ERC_LiLa

Largo Gemelli 1, 20123 Milan, Italy

This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme - Grant Agreement No. 769994.