

Natural language processing

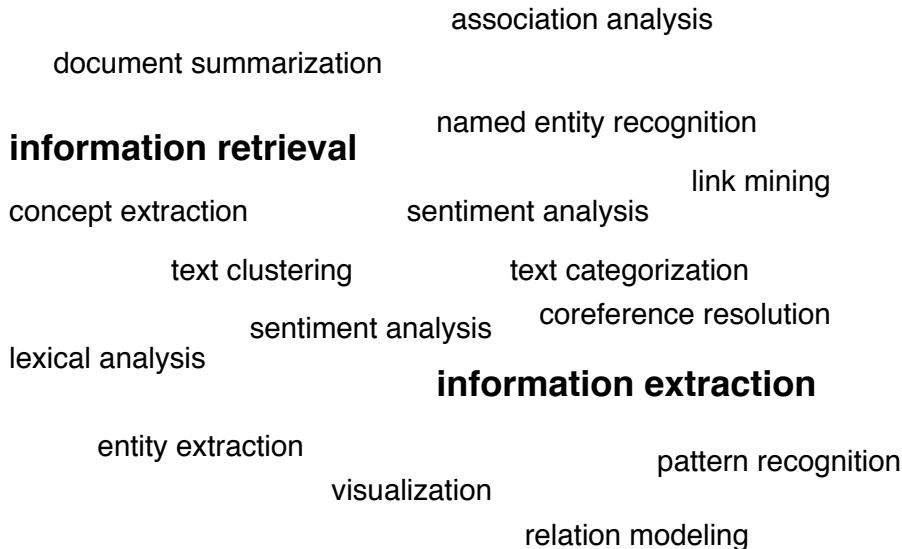
Slavko Žitnik

University of Ljubljana
Faculty for computer and information science



March 2024

Natural language processing



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Ivan Cankar was born in the Carniolan town of Vrhnika near Ljubljana. He was one of the many children of a poor artisan who emigrated to Bosnia shortly after ...

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Ivan Cankar je za svoje pisateljsko delo uporabljal številne šifre in psevdonime. Ti so značilni predvsem za zgodnja leta njegovega ustvarjanja. Izmišljena ...

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Ivan Cankar se je rodil na Vrhniki (na Klanecu) 10. maja 1876 kot osmi otrok v propadajoči obrtniško – proletarski družini trškega krojača. Mladost je preživel na ...

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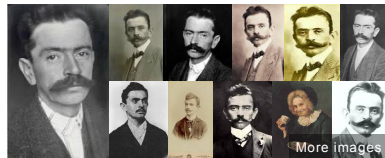
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More images

Ivan Cankar

Writer

Ivan Cankar was a Slovene writer, playwright, essayist, poet and political activist. Together with Oton Župancič, Dragotin Kette, and Josip Mum, he is considered as the beginner of modernism in Slovene literature.

[Wikipedia](#)

Born: May 10, 1876, [Vrhnika](#)

Died: December 11, 1918, [Ljubljana](#)

Education: [University of Vienna](#)

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Ivan Cankar

From Wikipedia, the free encyclopedia

Ivan Cankar (ⓘ pronunciation (help·info)) (10 May 1876 – 11 December 1918) was a **Slovene** writer, playwright, essayist, poet and political activist. Together with **Oton Župančič**, **Dragotin Kette**, and **Josip Murn**, he is considered as the beginner of **modernism** in **Slovene literature**. He is regarded as the greatest writer in the **Slovene language**, and has sometimes been compared to **Franz Kafka** and **James Joyce**.^[1]

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Biography



Cankar's birth house in Vrhnika

Ivan Cankar was born in the **Carniolan** town of **Vrhnika** near **Ljubljana**. He was one of the many children of a poor artisan who emigrated to **Bosnia** shortly after Ivan's birth.^[2] He was raised by his mother, **Neža Cankar née Pivk**, with whom he established a close, but ambivalent relationship.^{[3][4]} The figure of a self-sacrificing and submissively repressive mother would later become one of the most recognizable features of Cankar's prose.^{[5][6]} After finishing grammar school in his hometown, he studied at the Technical High School (*Realka*) in Ljubljana.

During this period, he started writing literature, mostly poetry, under the influence of Romantic and post-Romantic poets such as **France Prešeren**, **Heinrich Heine**, **Simon Jenko** and **Simon Gregorčič**.^[7] In 1893, he discovered the epic poetry of **Anton Aškerc**, which had a

huge influence on the development of his style and ideals. Under Aškerc's influence, Cankar rejected the sentimental post-Romantic poetry and embraced **literary realism** and **national liberalism**.^[8]

In 1896, he enrolled at the **University of Vienna**, where he studied engineering, but later switched to Slavic philology.^[2] In Vienna, he soon started to lead a bohemian lifestyle. He came under the influence of contemporary **European literature**, especially **decadentism**, **symbolism** and **naturalism**. He became friends with **Fran Govekar**, a young Slovene writer and intellectual living in Vienna, who introduced him to **positivism** and **naturalism**.^[9] Between 1897 and 1899, Cankar's core

Ivan Cankar



Born	10 May 1876 <div>Vrhnika, Duchy of Carniola, Austria-Hungary (now in Slovenia)</div>
Died	11 December 1918 (aged 42) <div>Ljubljana, Kingdom of Serbs, Croats and Slovenes (now the capital of Slovenia)</div>
Occupation	Writer, essayist, playwright, poet, political activist
Genres	plays, short stories, <i>short novels</i> , essays
Literary movement	Symbolism, Modernism



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Ivan Cankar

DBpedia entry

dbpprop:birthDate	▪ 1876-05-10 (xsd:date)
dbpprop:birthPlace	▪ Vrhnika, Duchy of Carniola, Austria-Hungary
dbpprop:dateOfBirth	▪ 10 (xsd:integer)
dbpprop:dateOfDeath	▪ 11 (xsd:integer)
dbpprop:deathDate	▪ 1918-12-11 (xsd:date)
dbpprop:deathPlace	▪ dbpedia:Kingdom_of_Yugoslavia ▪ dbpedia:Ljubljana
dbpprop:genre	▪ plays, short stories, short novels, essays
dbpprop:id	▪ Ivan_Cankar_
dbpprop:influenced	▪ most of modern Slovenian literature, Fulvio Tomizza
dbpprop:influences	▪ dbpedia:Friedrich_Nietzsche ▪ dbpedia:Leo_Tolstoy ▪ dbpedia:Ralph_Waldo_Emerson ▪ dbpedia:Fyodor_Dostoyevsky
dbpprop:movement	▪ dbpedia:Modernism ▪ dbpedia:Symbolism (date)



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dbpprop:influences	▪ dbpedia:Friedrich_Nietzsche

Text excerpt

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http://tradicionalni-iskalnik.si

Ivan Cankar

Išči

666 najdenih zadetkov:

[Ivan Cankar - Wikipedija, prosta enciklopedija](#) ★★★★★

Ivan Cankar se je rodil v hiši Na klancu 141, kot eden od dvanajstih otrok obrtniško-proletarske družine. Leta 1882 se je vpisal v osnovno ...

[Ivan Cankar – največji mojster slovenske besede](#) ★★★★★★

Ivan Cankar se je rodil na Vrhniki (na Klancu) 10. maja 1876 kot osmi otrok v propadajoči obrtniško – proletarski družini trškega krojača ...

[Cankarjeva smrt je bila političen umor](#) ★★★★★★

Cankarjeva smrt je bila političen umor. Pisatelj, politik in ljudski tribun Ivan Cankar Ivan Cankar velja za največjega slovenskega pisatelja in ...

[\[PDF\] Ivan Cankar \(1876 - 1918\)](#) ★★★★★★

Ivan Cankar (1876 - 1918). Največji mojster slovenske besede in osrednja postava v moderni književnosti izvira iz revne družine ...

[ŽIVLJENJEPIŠ Ivan Cankar](#) ★★★★★★

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[Ivan Cankar memorial house](#) ★★★★★★

Ivan Cankar memorial house. Ivan Cankar (1876 – 1918) is considered to be Slovenia's most important writer. The original house ...

1 | 2 | 3 | 4 | 5 | ... | [Zadnja](#)

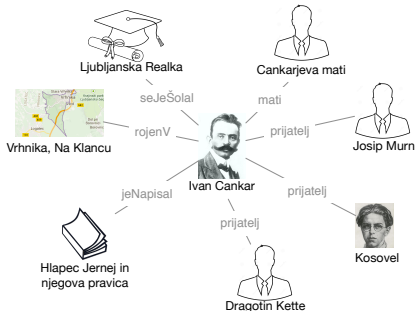


http://semantični-iskalnik.si

Ivan Cankar

Išči

Informacije ekstrahirane iz 25 zadetkov, najdenih 666:



[Ivan Cankar - Wikipedija, prosta enciklopedija](#) ★★★★★

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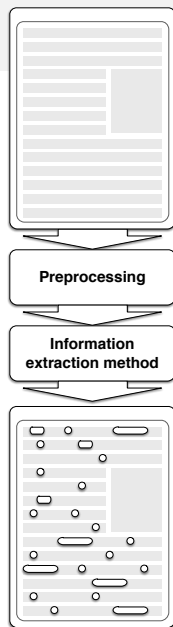
Definition

Information extraction

- **type of** information retrieval
- **goal** to automatically extract structured data from unstructured data sources

Subtasks

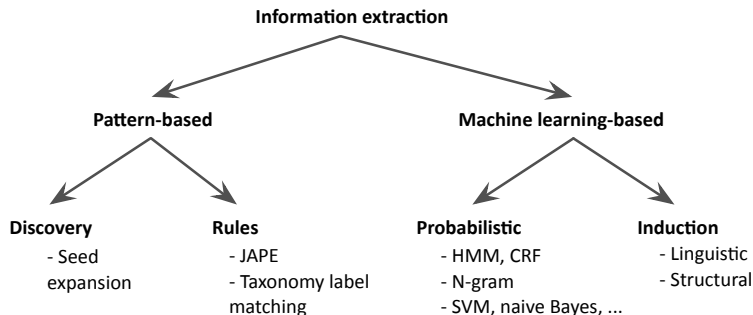
- named entity recognition
- relationship extraction
- coreference resolution



Preprocessing

	John is married to Jena . They work at OBI .
Sentence detection	John is married to Jena . They work at OBI .
Tokenization	John is married to Jena . They work at OBI .
Lemmatization	John be marry to Jena . They work at OBI .
Part-of-speech tagging	NNP VBZ VBN TO NNP . PRP VBP IN NNP .
Dependency parsing	<p>John is married to Jena . They work at OBI .</p> <p>Diagram illustrating dependency parsing with arrows and labels (nsubjpass, auxpass, prep, pobj, nsubj, pobj) connecting words.</p>

General approaches

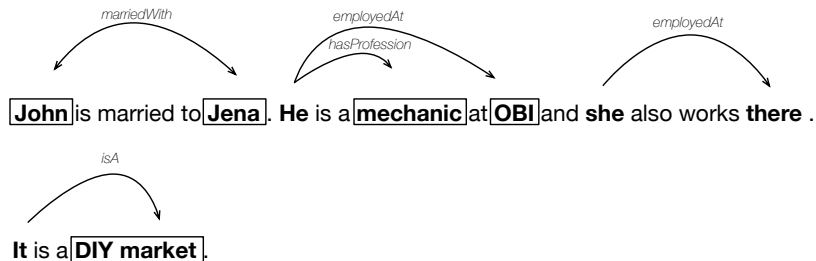


Named entity recognition

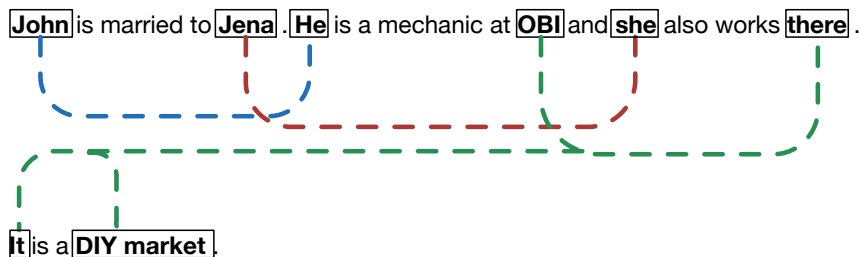
Person Person Position Organization
John is married to **Jena**. **He** is a **mechanic** at **OBI** and **she** also works **there** .

Organizacija
It is a **DIY market** .

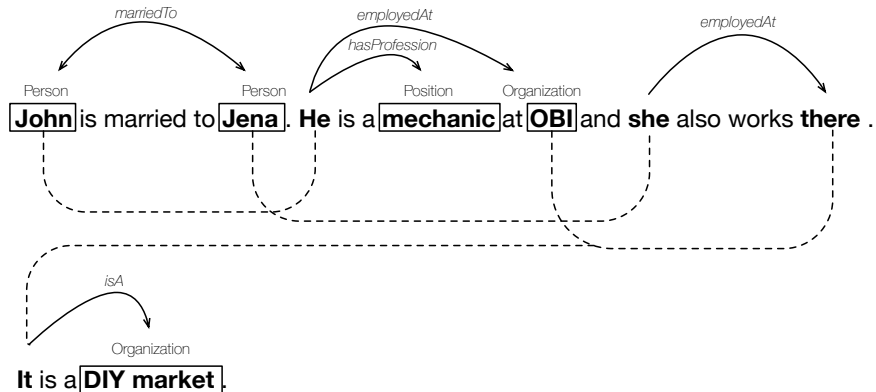
Relationship extraction



Coreference resolution



End-to-end information extraction



Course goals

Goals

- To study algorithms and methods for building computational models of natural language processing.
- To study issues involved in understanding natural languages together with cognitive and linguistic phenomena.
- To identify a text processing problem, design a solution and practically solve it.
- To get to know existing NLP approaches, techniques, tools and the state-of-the-art in the field.
- To become proficient in the end-to-end text processing problems handling.

Syllabus

Proposed syllabus

- Corpora acquisition and tagging, preprocessing techniques
- Information extraction tasks and systems
- Slovene text processing, regular expressions, rule based systems
- Unsupervised learning and visualisation, classification and tagging techniques
- Semantic web and ontologies (optional)
- (Deep) Neural networks for text (optional)
- Generative and conversational AI (optional)
- LLMs and new NLP frameworks (optional)
- Text processing assignment (practical work)

Assignment goals

Goals

- End-to-end NLP task processing
- Understanding of existing works
- Presenting results in an article-like report

Tools

- Python 3.10 (Anaconda) and an optional deep NLP library (PyTorch, Tensorflow, Keras)
- Preferred IDE: JetBrains PyCharm (free for students, otherwise Community Edition)
- Other tools & languages: KNIME, Orange, ...

REPORT

Submission

PDF Report

- Follow IMRAD (Introduction-Methods-Results-And-Discussion) structure. A full paper should have Abstract, Introduction, Related work, (Data), Methods/Algorithms/..., Results/Evaluation/Experiments, (Discussion) and Conclusion.
- Use provided LaTeX template (if not submitting to another venue).
- Submit a manuscript up to 6 pages long (max) + references + appendices.

PDF Repo

- Follow structure of work, (Results)
- Use pro
- Submit append

FRI Natural language processing course 2021
Project report

Natural language processing course Latex Template

John Doe, Jane Doe, and Mike Smith

[illegible]

Keyword1, Keyword2, Keyword3 ...

Advisors: Slavko Žitnik

Introduction

These latex files are intended to serve as a template for the NLP course at FRI. The template is adapted from the FRI Data Science Project Competition. If you find mistakes in the template or have problems using it, please consult Jure Demšar (jure.demšar@fri.uni-lj.si).

In the Introduction section you should write about the relevance of your work (what is the purpose of the project

You can write equations inline, e.g. $\cos \pi = -1$, $E = m \cdot c^2$ and α , or you can include them as separate objects. The Bayes's rule is stated mathematically as:

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}, \quad (1)$$

RELATED WORK

Related work

Related work search

- NLP Journals, conferences
 - Computational linguistics, TACL, NLE, IJCL
 - ACL 2023, EMNLP 2023, NeurIPS 2023, LREC-COLING 2024
- NLP Shared Tasks, workshops
 - CoNLL 2020 SemEval 2020, CodaLab
- Code, paper repositories
 - arXiv.org, Google Scholar, Papers with code, HuggingFace

Slovene NLP resources

- NLP Journals, conferences
 - Slovenščina 2.0
 - JTDH 2020
- NLP resources, projects
 - CLARIN.SI, CJVT, slovenscina.eu

slavko.zitnik@fri.uni-lj.si