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Development of Named Entities Recognition for French Newspapers

Journée d'information
Europeana Newspapers

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BnF / Paris, France

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@cneudecker

Staatsbibliothek
zu Berlin
Preußischer Kulturbesitz

What is „Named Entity Recognition“?

- Named Entity Recognition (NER) is a sub-task of Information Extraction and is typically understood as being part of the area of Computational Linguistics / Natural Language Processing.

- The main aim of NER is the automatic extraction and classification of knowledge or information from semantically unstructured text.

- NER is still subject to academic research (cf. Google & MSR Competition) – practical use in the cultural heritage digitisation sector remains a rare case.

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Asked differently: What is a „Named Entity“?

- PERSON:
  - Names of persons and families, but also names of fictional persons („Albert Einstein“, „Präsident der USA“, „Micky Maus“)
- ORGANISATION:
  - Names of companies, governemental or non-governemental organisations („IBM“, „The Beatles“, „Labour Party“)
- PLACE:
  - Cities, Provinces, Counties, geographical areas, asf. („Paris“, „Haute-Pyrénées“, „Alpes“)

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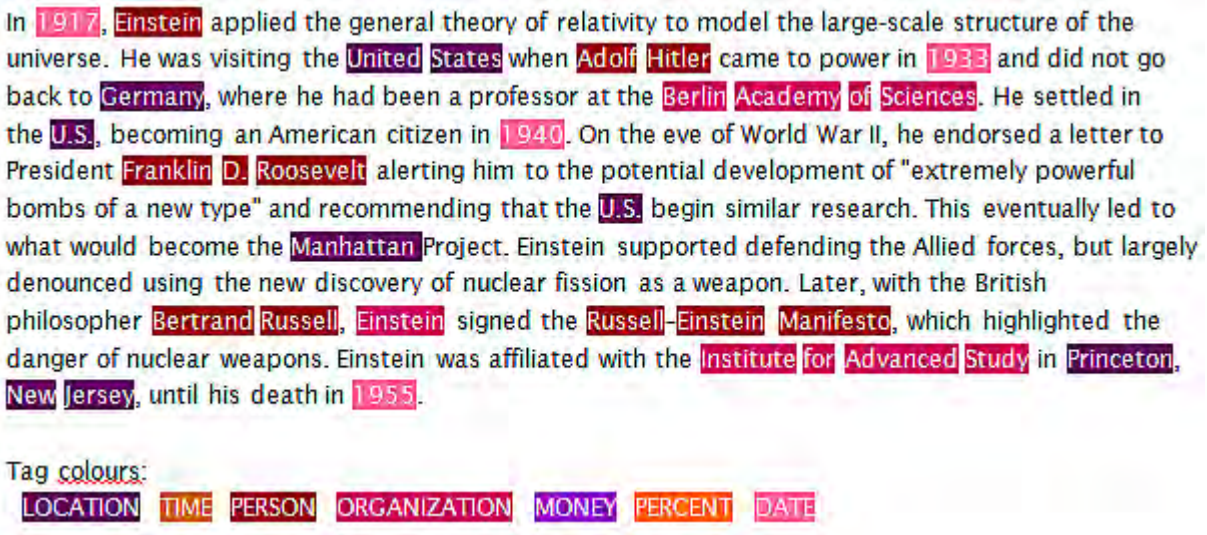
NER (I)

1. Detection/Classification of person names, places and organisations in a running text (includes POS)



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NER (II)

2. Disambiguation of terms (Example “Jordan”) through contextual information

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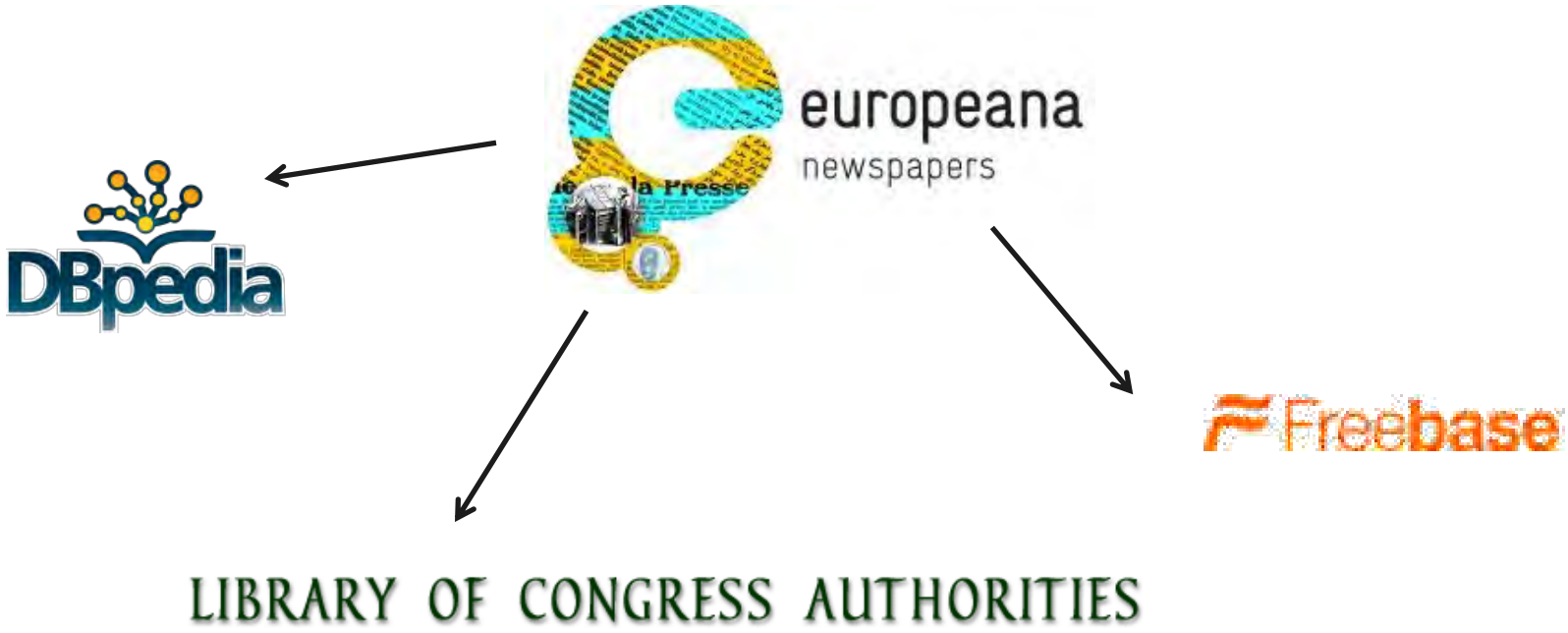
NER (III)

3. Linking to authority files and online databases (Linked Data)



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Supported languages in ENP

3 Languages:

- German
- Dutch
- French

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Approaches

- Machine learning vs. rule-based
- Advantages of machine-learning systems:
  - No need for specific linguistic expertise
  - Processing of large amounts of material
- Advantages of rule-based systems:
  - Can be tuned to very high accuracy for particular texts
  - Adaptation to local grammar and specific text style

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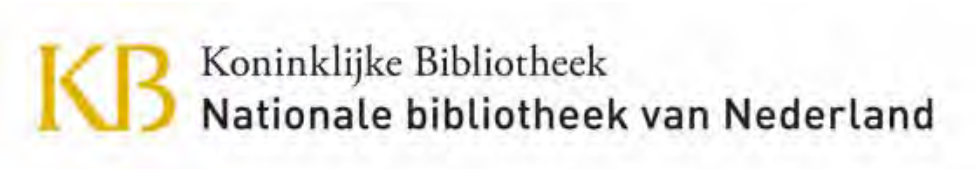
Software

- Open Source ML software developed by Stanford University, adapted and extended for Europeana Newspapers by the KB National Library of the Netherlands



- Software is available as open source from Github for download and testing: https://github.com/KBNLresearch/europeananp-ner

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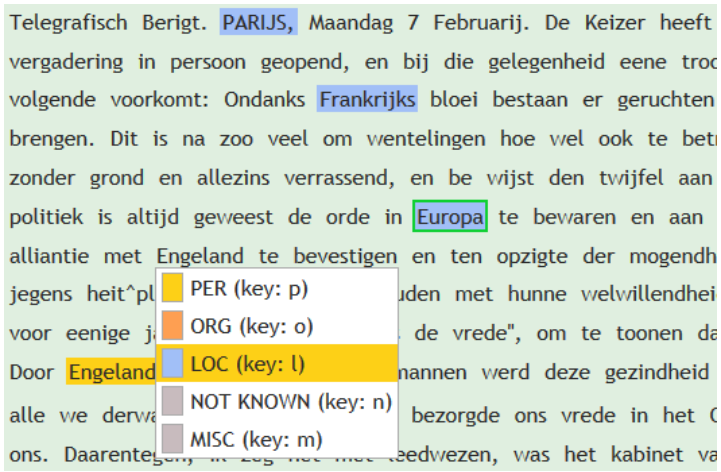
Training

- Training the NER systems with the help of manually annotated corpora („gold corpus“) and gazzetteers



- Publication of annotated data from ENP as open data

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Encoding

- Results of NER are stored in a library specific format: ALTO (Analyzed Layout and Text Object)

- Versions > 2.1 of ALTO specifically allow to use NER „Tags“

```
<String STYLEREFS="ID7" HEIGHT="132.0" WIDTH="570.0" HPOS="5937.0"
VPOS="3279.0" CONTENT="Reynolds" WC="0.95238096" TAGREFS="Tag5"></String>
<String STYLEREFS="ID7" HEIGHT="102.0" WIDTH="540.0" HPOS="18438.0"
VPOS="22008.0" CONTENT="Baltimore" WC="0.82539684„ TAGREFS="Tag10"></String>
…
<Tags>
    <NamedEntityTag ID="Tag5" TYPE="Person" LABEL="Reynolds"/>
    <NamedEntityTag ID="Tag6" TYPE=”Place" LABEL=”Baltimore"/>
</Tags>
```

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Problems and challenges

- OCR errors reduce the accuracy of the classification and slow down the overall processing time for recognition due to high noise.

- Historical spelling variation for person names and place names in particular.

- In many cases the historical spelling variants can not be found in online knowledge bases.

→ Specific adaptation of the software via external modules

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Initial results: Dutch

	Persons	Places	Organisations
Precision	0.940	0.950	0.942
Recall	0.588	0.760	0.559
F-measure	0.689	0.838	0.671

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Why Named Entity Recognition?

- Example: Analysis of log files from the newspaper collection of the National Library of Wales shows that *9 out of 10 queries are for a person or place name!*

(Source: Paul Gooding, Exploring Usage of Digital Newspaper Archives through Web Log Analysis: A Case Study of Welsh Newspapers Online, presented at DH2014, Lausanne)

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Thank you for your attention!
Merci de votre attention!

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