



LINDAT/CLARIAH-CZ Large Research Infrastructure

Digital Research Infrastructure for Language Technology, Arts and Humanities

"Digitální výzkumná infrastruktura pro jazykové technologie, umění a humanitní vědy"

Funded by:



Jan Hajič

LINDAT/CLARIAH-CZ coordinator

Institute of Formal and Applied Linguistics

Computer Science School

Faculty of Mathematics and Physics

Charles University, Prague, Czechia

Christopher Cieri 1963-2023

Chris Cieri was a native Philadelphian who grew up among the diverse population in the neighborhoods of South Philadelphia. He had a lifelong affinity for the Italian language, and it was no surprise that when he entered the University of Pennsylvania as an undergraduate, he chose Linguistics for his major. In fact, he concluded his Masters' degree concurrently with his Bachelor studies in 1985-1986; his thesis topic was *Italian Lexical Items in the English Speech of Italo-Americans*. Under the direction of Bill Labov, he received his PhD at Penn as well. His dissertation, *Modeling Phonological Variation in Multidialectal Italy*, was based on fieldwork in L'Aquila, Italy, of which he had fond memories and spoke about often.



Linguistic Data Consortium, director

Long-term member of LINDAT IAB



In memory of the many victims.

@Faculty of Arts, Dec. 21, 2023





- LINDAT = CLARIN & DARIAH & EHRI in Czechia
 - European networks for <u>supporting research (in SSH)</u>
 - CLARIN: Language resources and technology
 - DARIAH: Digital humanities and arts
 - EHRI: European Holocaust Research Infrastructure
 - LINDAT/CLARIAH-CZ: 2023-2026
 - Follows previous periods: 2010-2014, 2015-2019, 2019-2022
 - · Combines membership in EU CLARIN, DARIAH and EHRI networks
 - 15 institutions in the Czech combined network (was: 4 in 2010, 11 in 2022)
 - UK, MU, Academy of Sciences, National and Moravian Libraries, NG, NFA
 - New in 2023:
 - » National Archives
 - » Masaryk Institute and Archives CAS
 - » Terezín Memorial
 - » Terezín Initiative Institute
 - » complements the already included Center for Visual History Malach





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LINDAT/CLARIAH-CZ

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CLARIN: La

DARIAH: Di

EHRI: Euro

LINDAT/CLA

- Follows pre
- Combines r
- **15** institutio
- UK, MU, Ac
 - New in 2

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Czech Republic

EHRI Czech National Node

Top-quality research on the Holocaust is a prerequisite for informed discussion about Czech, European and world modern history and for understanding the risks and mechanisms of racism and genocide in their various forms. The European Holocaust Research Infrastructure (EHRI) connects collections and sources divided by borders and languages, promotes digital methods and supports researchers. The Czech EHRI national node is a gateway to EHRI services and community and a signpost for Holocaust research in the Czech Republic.

Research infrastructure

The EHRI Czech national node has been part of the research infrastructure LINDAT/CLARIAH-CZ supported by the Ministry of Education, Youth and Sports since 2023.

Since 2018, EHRI has been on the roadmap of European research infrastructures and is currently transforming into a permanent organisation - European Research Infrastructure Consortium (ERIC). The Czech Republic supports this process through the Ministry of Education, Youth and Sports and is represented in the EHRI Interim

Main goals and services

EHRI-CZ provides the following types of services:

- Makes EHRI data and services available, including EHRI Portal, EHRI Document Blog, EHRI Editions, EHRI Geospatial Repository, Conny Kristel Scholarship, and
- Creates data on sources on the history of the Holocaust in the Czech lands and uploads them to the EHRI Portal.
- Links and enhances the victim databases and methodologically supports their further development.
- Applies digital methods to the digitised sources, including automatic text and speech recognition, identification of places, historical actors, keywords, etc. Supports research using spatial methods and interactive maps, including the MemoMAP application.



Example of a document from the Terezin Research Guide

January 5, 2024



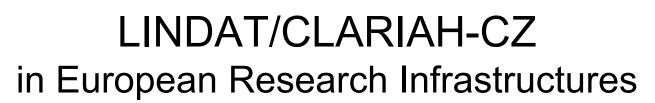




LINDAT timeline + Czechia in ERICs









- ERIC = European Research Infrastructure Consortium
 - Supervising body
 - ESFRI (European Strategy Forum on Research Infrastructures)
 - Members are countries (EU member or associated states)
 - ... or international organizations (NTU); associated countries possible (U.S.)
- CLARIN ERIC
 - Original network (since 2010)
 - Consortium members in
 - NCF, SCCTC, CLIC, Annual Conference committee, award committees
- DARIAH ERIC
 - Since 2014
 - Consortium members in
 - NCC, legal VCC
- EHRI network (soon to be ERIC, January 2025)
 - EHRI: 3 preparatory projects by EU
 - EHRI CZ: partner in all 3 preparatory projects



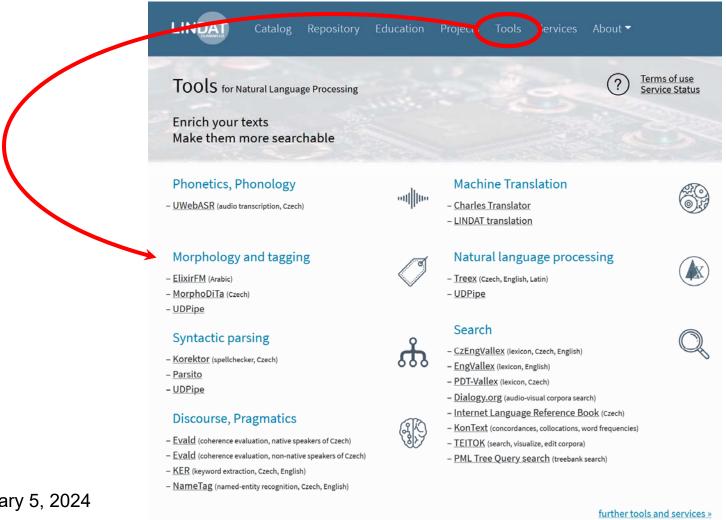


- http://lindat.cz (redirected to https://ufal.mff.cuni.cz/lindat)
- Data, Tools, Services, Expertise
 - Language Resources Data Repository
 - Software tools repository
 - Web services with both API and User Interactive Interface
- Computing infrastructure
 - New hardware for deep learning computations due in 2024-2026
 - Coming as we speak for 7 partner institutions
- Cooperation with other Czech RI from SSH
 - Czech National Corpus (CNC)
 - Czech Literary Bibliography (CLB)
 - Archaeological Information System of the Czech Republic (AIS CR)





Web at https://lindat.cz







LINDAT/CLARIAH-CZ in 2023 (1)

- Repository development (CLARIN DSpace)
 - Upgrade to version 7.x of DSpace major undertaking, w/external partners
 - Will be used by Charles University Library for Open Data Library
- Universal Dependencies project
 - General support, official editions (every 6 months), now at v2.13 (Nov. 2023)
 - Tools: UDPipe (now UDPipe 2 -> LinPipe soon)
- Uniform Meaning Representation project
 - With partners in the U.S. (Brandeis, Colorado, New Mexico)
 - Official release repository for UMR 1.0





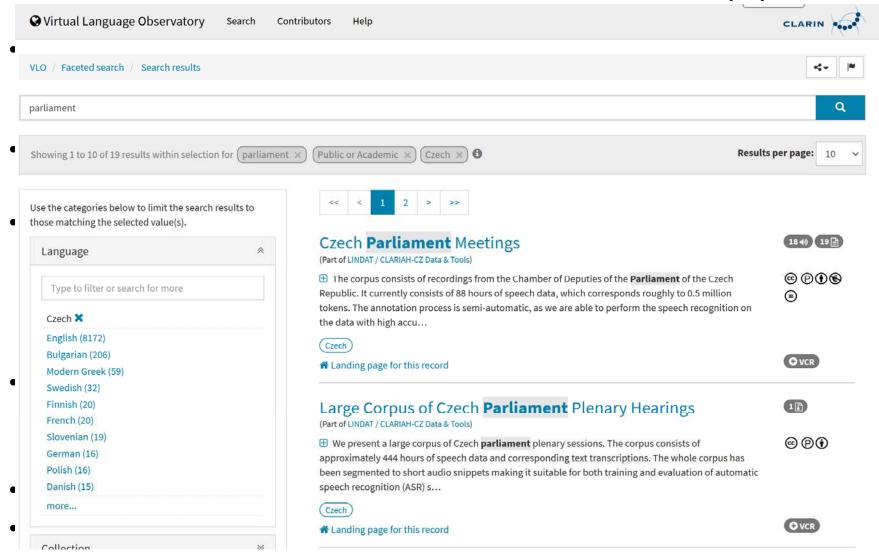
LINDAT/CLARIAH-CZ in 2023 (2)

- Prague Dependency Treebank Consolidated ed. (PDT-C 1.0 -> 2.0)
 - Approx. 4MW, manual dependency syntax for all parts underway
 - PDT, PCEDT, PDTSC, Faust; TR annotation same, a-layer: full manual, corrections
- Prague Discourse Treebank on top of PDT
 - Adding cross-sentence annotation
- SynSemClass
 - Multilingual (cs, en, de, es, [kr in the works]) event type ontology, now v5.0
 - A.k.a synonym dictionary of verbs, with valency, linked to corpora and other lexical resources
 - New search tool in 2023
- TEI:TOK
 - Platform for rich annotation and multimedia content
 - Many new datasets, continued ParlaMint project (led by CLARIN-SI)
- New ASR service (UWB Pilsen)
- Consolidation of MT interface underway



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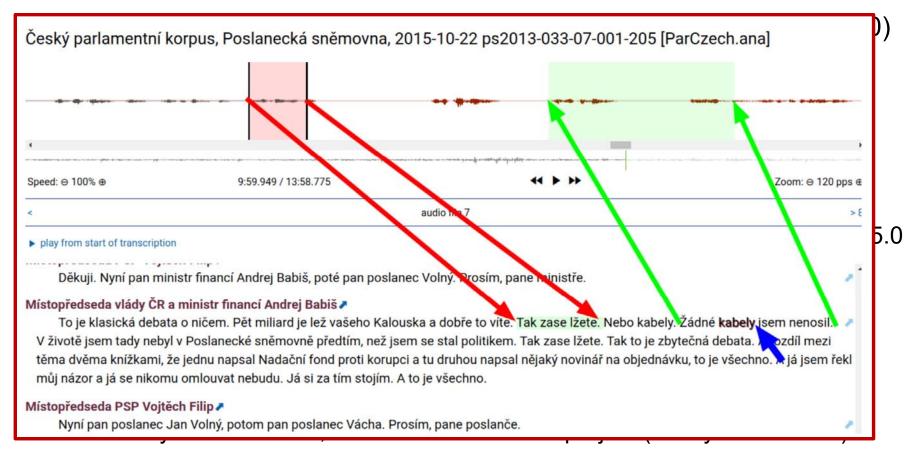
LINDAT/CLARIAH-CZ in 2023 (2)







LINDAT/CLARIAH-CZ in 2023 (2)



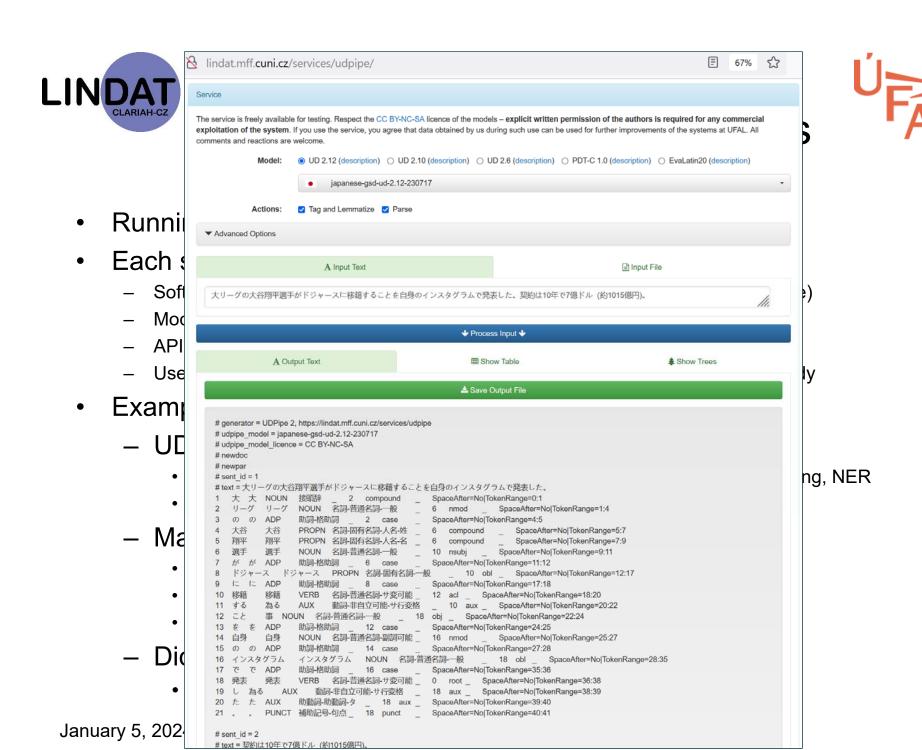
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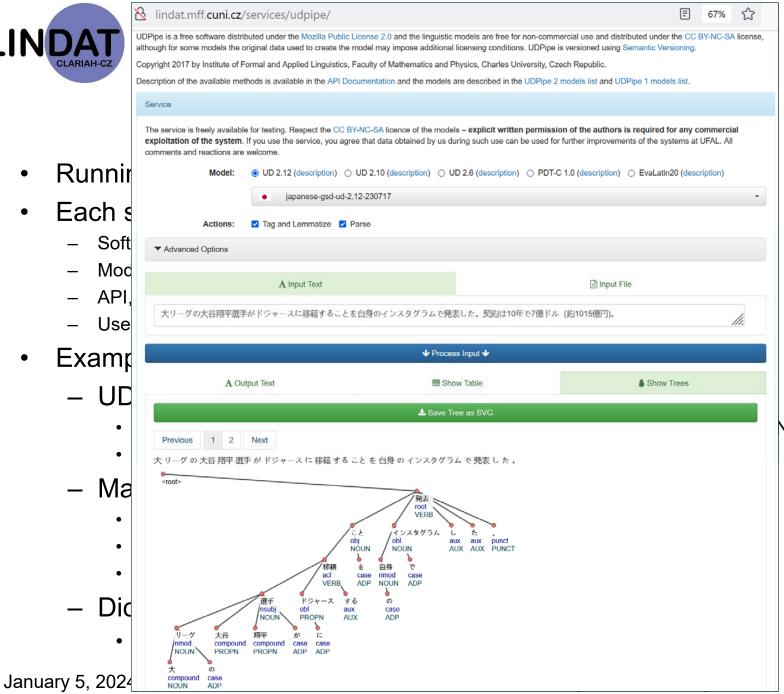


LINDAT/CLARIAH-CZ services

- Running services (<u>https://lindat.cz/en/services</u>)
- Each service available as
 - Software to download for those able to run it locally, modify etc (Open Source)
 - Models to download e.g. for machine translation, for locally run software
 - API, for running programmatically but remotely
 - User interface (running on small samples, cut & paste, etc.) open to everybody
- Examples
 - UDPipe 2.0
 - Linguistic analysis: segmentation, morphology, lemmatization, POS, parsing, NER
 - 100+ languages
 - Machine translation
 - en-cs and en-fr at human level of accuracy
 - · Includes uk-cs
 - Also on Android (Charles Translator)
 - Dictionaries
 - Valency, semantics







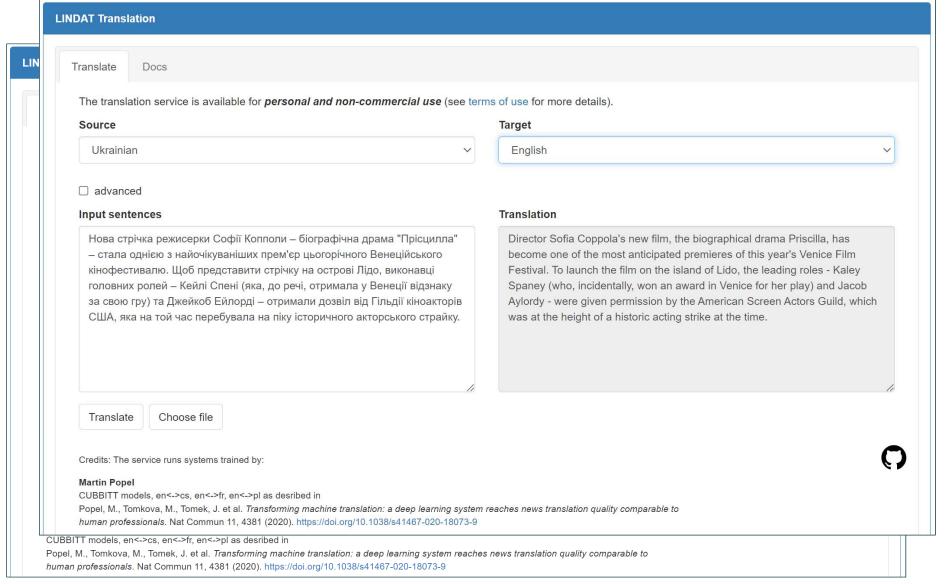


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LINDAT/CLARIAH-CZ partner services (1)



- Institute of the Czech Language, Czech Academy of Sciences (CAS)
 - Internet Language Reference Book ("Internetová jazyková příručka") 40 mil. acc/yr
 - In cooperation with Masaryk Univ., Faculty of Informatics
- Faculty of Arts, Charles University (FF UK)
 - LINDAT team participates at building the Center for Digital Humanities at FF UK
 - Corpora (diachronic, educational), Exhibitions (manuscripts)
 - Didaktikon project educational project with National Library, other universities
- Masaryk University Brno Faculty of Arts
 - Own digital repository at https://digitalia.phil.muni.cz/en (Digitalia MUNI ARTS | PHIL)
- University of West Bohemia, Faculty of Applied Sciences
 - Technology speech recognition services
- Libraries (National Library, Moravian Library, Library of CAS)
 - Upgrade to Kramerius 7 (underlying library management system)
 - Czech Digital Library in all 3 institutions (137 mil. pages, 300,000+ books)



Internetová jazyková příručka





		Hlavní stránka	Hledání konkrétního slova nebo t	varu slova.			
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LINDAT/CLARIAH-CZ partner services (1)

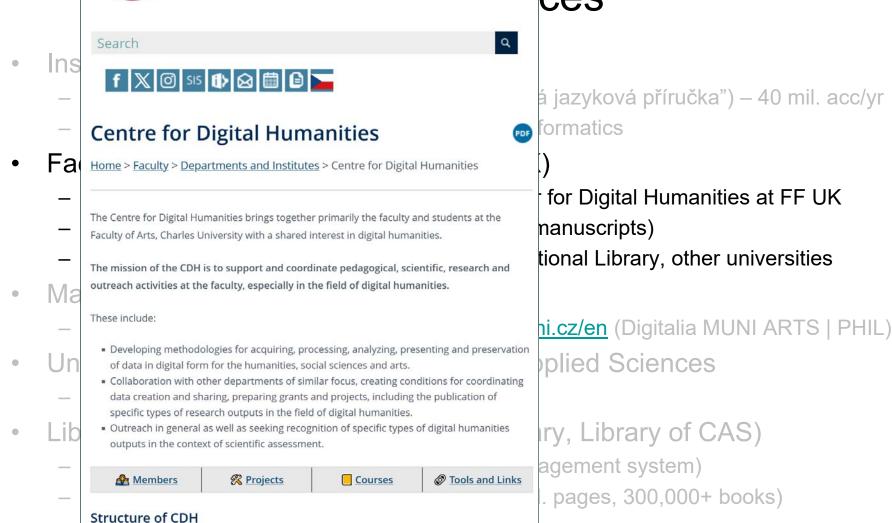


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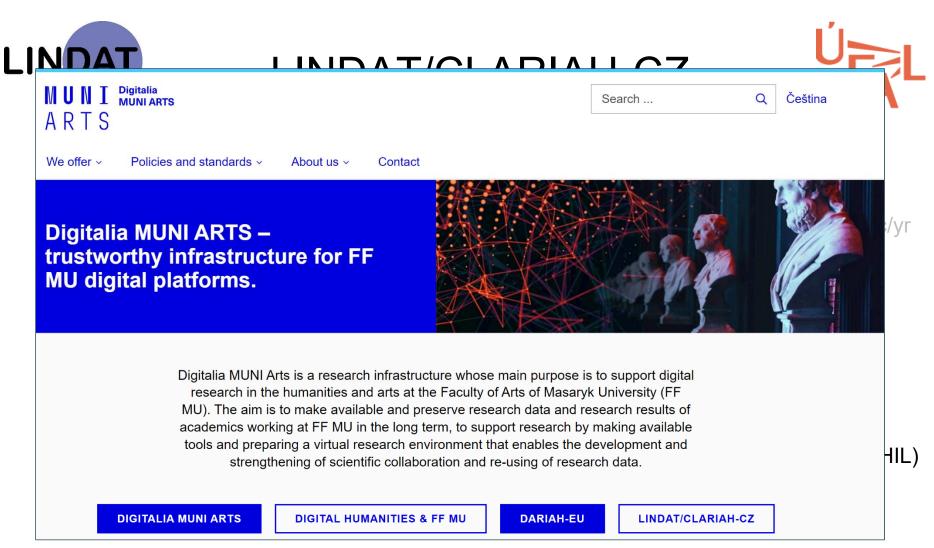
The CDH was established and is regulated by OD 28/2022 " Statutes of the Center for Digital



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Search ...

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Policies and standards ~

About us ~

Contact

Digitali trustwo MU diq

Involved platforms

We present a list of individual platforms involved in the Digitalia MUNI ARTS infrastructure. By joining the infrastructure, long-term protection and quality care of the contained data is ensured. Links to other faculty platforms can be found in a <u>separate catalogue</u>.



The aim of the project is to make the extensive work of Arne Novák accessible. The collection includes digitized materials from the Central Library of the FF MU.



The factographic database provides access to archaeological data and visualisations of Early Bronze Age arrowheads from Moravian and Slovak sites.



The database contains information about individual cinemas, their programmes and films shown in Brno in 1918–1945.



The digital library contains freely available full texts of journals, monographs and proceedings published at the Faculty of Arts of Masaryk University.



The image database offers several hundred samples of liturgical vestments and other ceremonial fabrics, mostly from the 18th century.



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UWebASR HTTP API

UWebASR HTTP API is a simple interface to speech recognition engine. The input data can be passed directly within the HTTP request (POST method) or as a link to a file in the form of a URL (GET method). Live audio stream recognition from a given URL is supported, as well. The output format includes plain text, machine-readable XML and JSON formats, and the WebVTT format for web captions. Recognition results (except TRS format) are streamed continuously.

For the UWebASR use the following values of variables:

- app_id use one of the following values to use the models provided by the UWebASR service:
 - o malach/en English Wav2Vec 2.0 model
 - o malach/de German Wav2Vec 2.0 model
 - o malach/cs Czech Wav2Vec 2.0 model
 - o malach/sk Slovak Wav2Vec 2.0 model

In other words, the full HTTP API endpoint for Czech is https://uwebasr.zcu.cz/api/v2/lindat/malach/cs.

The UWebASR HTTP API uses the underlying SpeechCloud platform. The platform has an architecture employing a set of real-time workers. Therefore it is possible that all of the workers are allocated and no further requests could be processed at the moment. This situation is indicated by the 503 HTTP status.

Each session employing the worker is limited to at most 3600 seconds. Longer sessions are automatically terminated. Since the speech recognizer runs faster than realtime in most situations, it means that the maximum length of the audio processed in the API is actually longer than 3600 seconds.



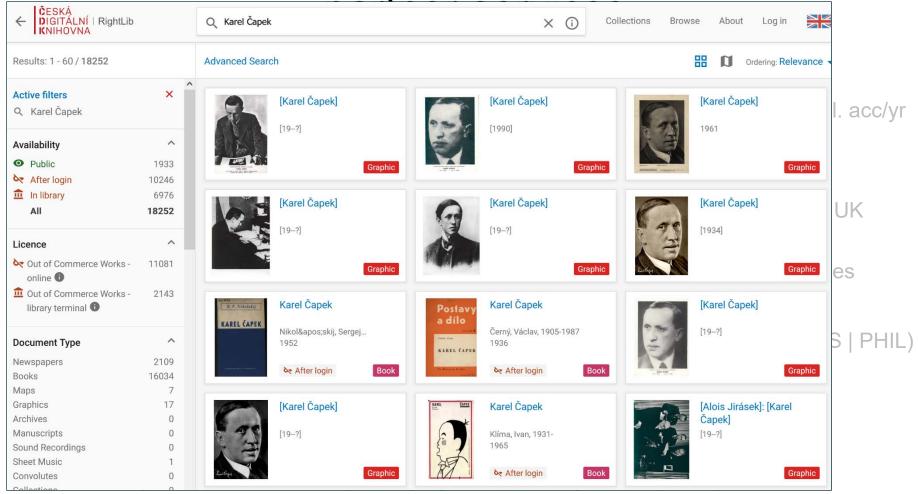
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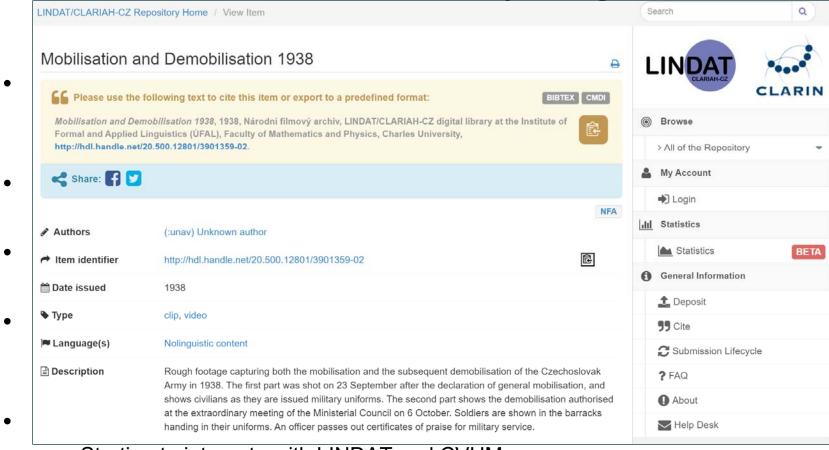




- Institute of Philosophy CAS
 - MEMORI project early middle ages, Czech Medieval Sources Online
 - Jan Patočka Archive Czech philosopher, dissident 1968-89
- Institute of History CAS
 - Czech historical bibliography
- National Gallery
 - Complete overhaul of digital collection hardware and sotware environment
- National Film Archive
 - Uses LINDAT repository for all open film documents (historical so far)
 - Direct play from repository
- EHRI group
 - Starting to integrate with LINDAT and Center for Visual History Malach
 - Documentation of documents digitized earlier (pre-LINDAT) (NA, ITI, PT)
 - EHRI CZ presentation and organization
 - Preparation of CLARIN-EHRI workshop, Prague, March 27-28, 2024

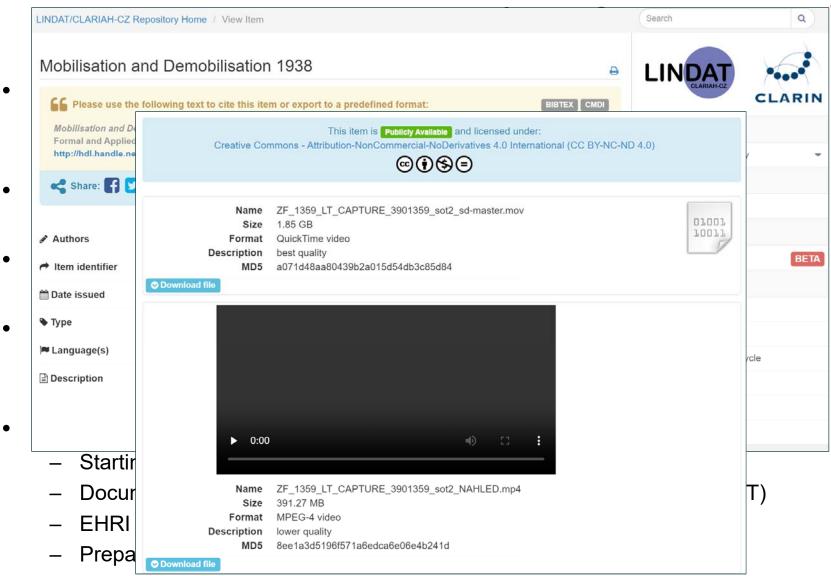






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Internal & User Publications in 2023



- Research Infrastructure made for (research) <u>users</u>
- LINDAT/CLARIAH-CZ
 - Distributed, virtual, open
- RI-Internal publications
 - About building the RI
 - Hardware, repository software, organizational matters, legal, networking (ELE)
 - Creating datasets, software, services
 - Papers typically at LREC, ACL, ...
- User publications (NB: hard to find...) using Zotero to collect
- 2023: [incomplete yet]
 - RI-Internal publications: 47
 - User / LINDAT partners: 339
 - User / rest of the world: <u>725</u>





Educational support

- CLARIN K-Centre for treebanking (with CLARINO Norway)
- Didaktikon (UK & City of Prague, @Campus Hybernská)
 - Educational activities for primary and secondary school level
- Courses
 - Regular (FF UK, FF MU)
 - E.g., Digital Humanities (fall 2023) at FF MU,
 - Continued education (FF UK)
 - Specialized open seminars
 - CVHM MFF UK (Holocaust topics) for teachers
 - Support for teaching in general (tools, data, services/UI)
- Students
 - Employed as data curators, annotators (universities)
 - Technological support (HW cluster, software, data)







DIDAKTIKON

Hybernská campus | Charles University | UK Forum | Contacts Search term Search



DIDAKTIKON - A NEW DIRECTION IN THE POPULARIZATION OF SCIENCE

Didaktikon is a popularization and educational center of Charles University, which was established in cooperation with the Hybernská Campus, or the capital Prague. This is a place intended for everyone who is interested in an informal approach to education.

School excursion

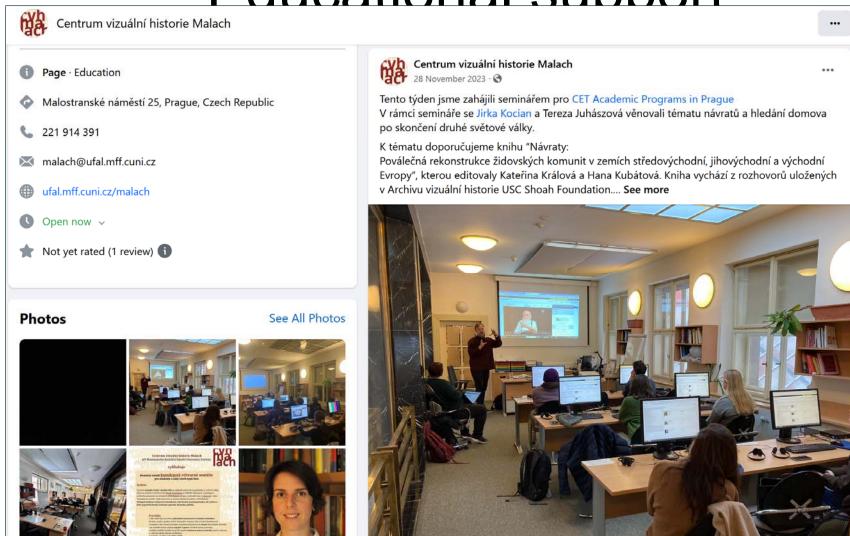
At Didaktikon, we mainly focus on excursions for primary and secondary schools. In the unique exhibitions, which were created in cooperation with our faculties, you will not only learn a lot of interesting information, but you can also try everything right away. In Didaktikon, we work with the socalled heuristic method, i.e. the method of guided discovery. In this way, students will find out in practice how abstract disciplines such as philosophy and mathematics can be understood for someone. At the same time, teachers and their students can choose from a wide range of activities that Didaktikon offers. Popularization lectures and workshops are held here, which represent a wide range of fields that can be studied at Charles University.

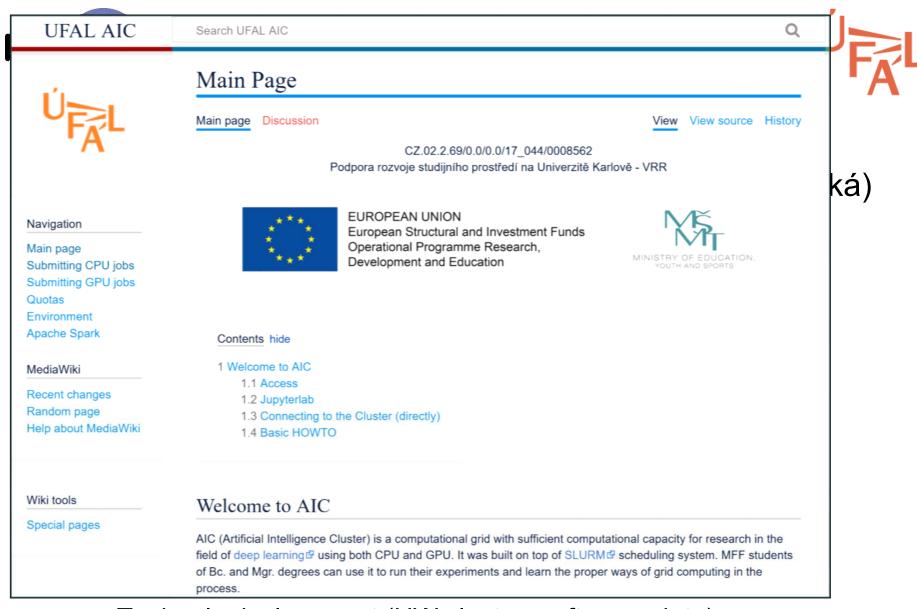
Afternoon courses

New this school year are the afternoon courses, which expand the scope of regular studies for those interested. The courses are intended for



Educational support





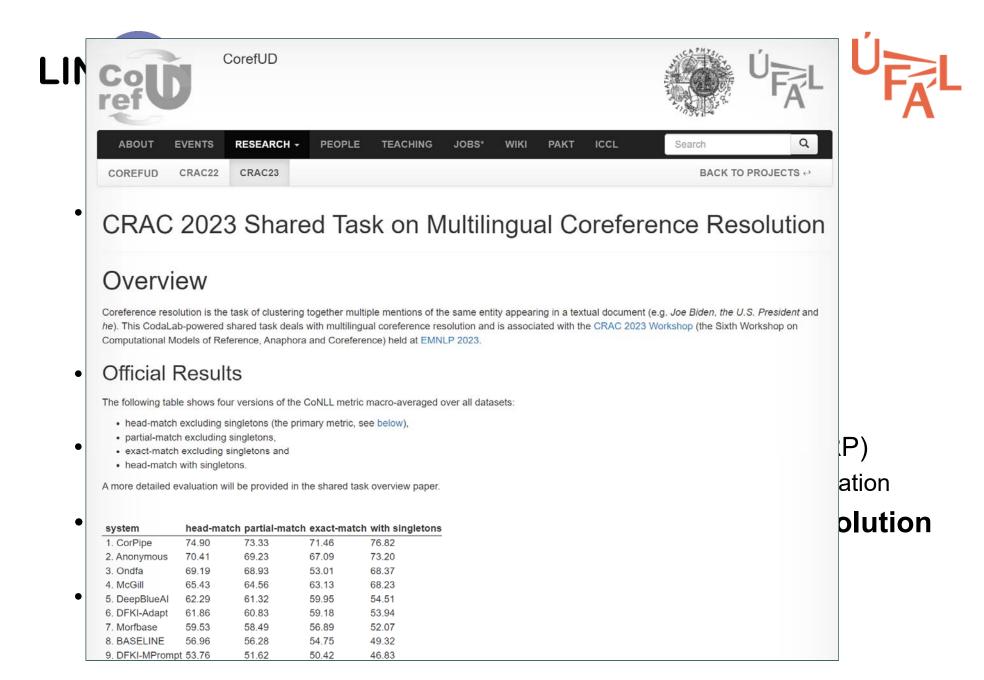
Technological support (HW cluster, software, data)



Specific datasets: Shared Tasks Support



- Supporting Shared Tasks
 - by data, manpower, participation
 - "Shared Task" = worldwide open competition (~kaggle etc.)
 - on a defined task
 - · data and metrics provided by organizers
- CoNLL Shared Task on dependency parsing (2017, 2018)
 - Using the Universal Dependencies collection, additional data
- CoNLL Shared Task on Meaning Representation Parsing (MRP)
 - Run in 2019 and 2020, Stephan Oepen & colleagues, co-organization
- CRAC Shared Task on Multilingual Coreference Resolution
 - 2022, 2023 co-organized, datasets in repository (EMNLP 2023)
- WMT Shared Tasks and Subtasks
 - Data/repository support for WMT





LINDAT/CLARIAH-CZ international cooperation



- International cooperation (support or development)
 - ELG European Language Grid, EU H2020 Call 29a
 - Automatic metadata harvesting continues
- SSHOC, Infrastructural H2020 project, followup
 - Part of CLARIN ERIC participation, <u>EOSC Marketplace</u>
- Humane-Al-Net: Al Center of Excellence, Call 48
 - Microprojects w/DFKI, INRIA, etc.
- ATRIUM 2024-2028, Horizon Europe INFRA
 - Archaeology, MT and object recognition
 - In cooperation with Czech RI: Archaeological Information System
- Everse 2024-2028, Horizon Europe INFRA
 - Long/term preservation of research software (SSH), w/CLARIN
- Support for other Horizon Europe projects
 - RESQ+ (IR), MEMORISE (Holocaust access)
 - HPLT (LLM data collection, LLM/TM building, 2022-2025)











inte

A space that combines petabytes of natural language data with largescale model training

Our Focus

archive

· Lots of monolingual and multilingual data consistently formatted and curated

 ${
m HPLT}$ high performance language technologies

- · Efficient and high-quality language and translation models
- · Sustainable and reusable workflows using high-perfomance computing

More about HPLT 4 https://hplt-project.org/ ₩ @hplt_eu Funded by: WELCOME TO BOARDS

We will help users find what is in language data

they were built through interactive boards.

and models, how they compare to others, and how



EUROPEAN LANGUAGE GRID





- International cooper
 - ELG European La
 - Automatic metadata ha
- SSHOC, Infrastructura
 - Part of CLARIN ERIC p
- Humane-Al-Net: Al Ce
 - Microprojects w/D
- ATRIUM 2024-2028
 - Archaeology, MT a
 - In cooperation with ~300
- Everse 2024-2028,
 - Long/term preserv
- Support for other Ho
 - RESQ+ (IR), MEM
 - HPLT (LLM data

We will retool how language data is generated, shared, and transformed into efficient large language and translation models making HPC centres ready to large scale NLP across Europe. petabytes of web data from the internet

- petabytes of web data from
- 2.5 trillion words of monolingual text

- of efficient language and
- consortium partners collaborating

Our Partners



UNIVERSITY OF HELSINKI



prompsit

PROMPSIT L.E.





UNIVERSITY OF EDINBURGH

Σ sigma2

CESNET

SIGMA2





LINDAT/CLARIAH-CZ EOSC CZ



- Czech European Open Science Cloud Association and Secretariat (EOSC CZ)
 - National support for central tasks and organization
- EOSC CZ Open Science I (2024-2028)
 - Project: National Repository Platform
 - Lead by Czech eInfra "CESNET"
 - LINDAT/CLARIAH-CZ significant partner (0,8 mil. EUR)
 - CLARIN-DSpace chosen as one of four repositories recommended nationwide
 - Funds repository(ies) development, upgrades, adaptation for national use
- EOSC CZ Open Science II (2025-2028)
 - Project led by Charles University (HQ)
 - LINDAT/CLARIAH-CZ will lead SSH workpackage (4 mil. EUR total), 1 of 8
 - Czech SSH RIs as partners, FSTP-like funding for others







Future continuation

- Contract (with cuts) until 2026 (originally: 1,8x more funding, -2029)
- LINDAT/CLARIAH-CZ on Czech Roadmap
- Czech Republic joins EHRI ERIC in early 2025
- Durable equipment (hardware, computing) grant under review
 - 2024-2026, 2 mil. EUR (shared by 7 partners of the RI)

Evaluation

- International panel + quantitative scientometrics at national level
 - Crucial for funding 2027-???? (legal changes special status?)
- Starts late 2024
- IAB may play a role
- Integration with / support to EOSC CZ





Thank you!

https://lindat.cz

