



Poznańskie Centrum
Superkomputerowo-Sieciowe

61-139 Poznań

ul. Jana Pawła II 10

tel: (+48 61) 858-20-01

fax: (+48 61) 852-59-54

office@man.poznan.pl

www.pcss.pl

Dariah.lab

Research Infrastructure for the Digital Arts and Humanities

1. Objective of **DARIAH-PL** - Polish national large-scale development and infrastructure project started in 2021
2. Funded under the **Smart Growth Operational Programme** 2014-2020 in the area „Development of modern research infrastructure of the science sector”
3. Built by a **consortium of 16 Partners**, 15 of which are members of DARIAH-PL - the largest humanities consortium in Poland
4. Comprises laboratory equipment, software tools, integrated digital resources from various fields of the art and humanities research
5. Recognized as **Time Machine Project**





Geoarchaeology

Non-invasive analysis and documentation of land, landscape or monuments.



Cultural Heritage

Access to and analysis of information about national culture in all its dimensions, i.e. source texts, their annotated critical editions, information about objects and forms of culture, etc.

Musicology

Research on traditional music and on the perception of musical phenomena (human cognitive sphere).

A Network of Distributed Research Laboratories



- **Complex infrastructure** with a single access point
- Designed based on **research scenarios analysis**
- **Browsable/searchable** by well known taxonomies (e.g. TaDiRAH, ACM CCS) as well as geographical location and institutional attribution
- **Exposed as a dataset** for an easy integration with existing catalogues, inventories or marketplaces

Acquisition, Storage and Provision of Source Data

Source data acquisition
and processing

Automated data sharing
service

Dataset processing and
ordering

- **Documentation and high-quality digitization** of physical objects, landscapes, archaeological data, and cultural heritage content
- **Hosting and delivery of source data**
 - reliable repositories dedicated to a specific type of content and its metadata
 - unambiguous object identification
 - automated data delivery
- **Multimodal corpora** processing and sharing

Documentation and High-Quality Digitization of Material Heritage Sites and Objects

- Locating potential archaeological sites
- Reconstructing structures beneath the earth's surface in a noninvasive way
- Generating digital models of art monuments, buildings and smaller objects
 - LIDAR and structured light scanners
 - Tripod-mounted and hand scanners
 - Software for processing 3D point clouds
 - Drones integrated with aerial scanning and photo equipment
 - Aerial photogrammetry, teledetection



Development of Machine-Readable Content Representation and its Metadata Enrichment

Machine-readable
content representation

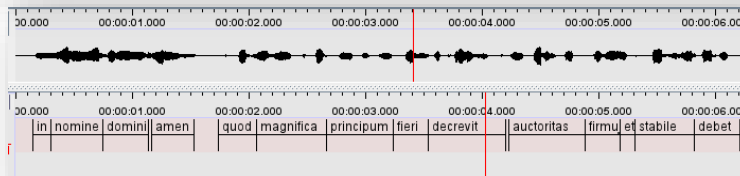
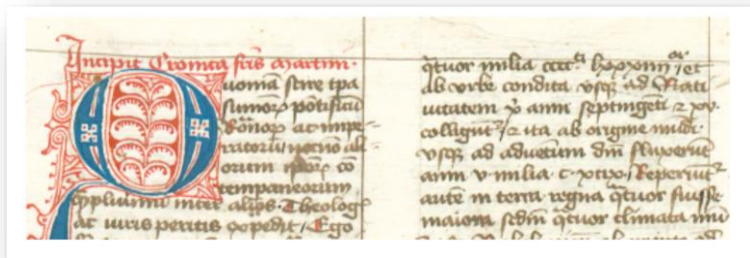
Automatic transcription
and annotation

Manual annotation,
transcription,
transliteration

- **Text, voice and music recognition** (OCR, HTR, ASR, OMR)
- **Transcription, transliteration, translation and annotation**, e.g.
 - linguistic and paralinguistic features annotation
 - named entity recognition
 - emotional overtone analysis
 - semantic annotation of concepts in images
- **Automatic data classification**, e.g.
 - thematic classification
 - keyword extraction

Historical Document Processing

- Processing of scans and photographs of historical documents, printed and handwritten, in order to retrieve their content with Optical Character / Handwritten Text Recognition
- Support for **retrieval of historical documents' content** with Automatic Speech Recognition of Polish and Medieval Latin
- Tools for **linguistic analysis of historical documents' content** in Polish and Latin



Data Consolidation Through Normalization, Standardization and Semantic Alignment

Thesauri, ontologies and
controlled dictionaries

Data mapping

Knowledge aggregation
and consolidation

- **Data consolidation** by normalization, standardization, and semantic unification
- **Data binding** and discovery of new relationships with use of existing Linked Data techniques, online thesauri, dictionaries and related ontologies
- **Building knowledge base** for flexible information exploration

Historical Texts Processing

- **Diachronic normalization** – modern spelling for historical text in Polish
- **Identification of modern synonymous and antonymic equivalents** for words in historical texts in Polish
 - verification of qualitative and quantitative hypotheses on the developmental processes of vocabulary or grammar
 - a new source of information for historians, sociologists and cultural specialists - an aid in finding texts written with the so-called old orthography



Multi-criteria Data Analysis, Detailed interpretation, and Processing

Data analysis and
interpretation

Data modeling and
relation visualization

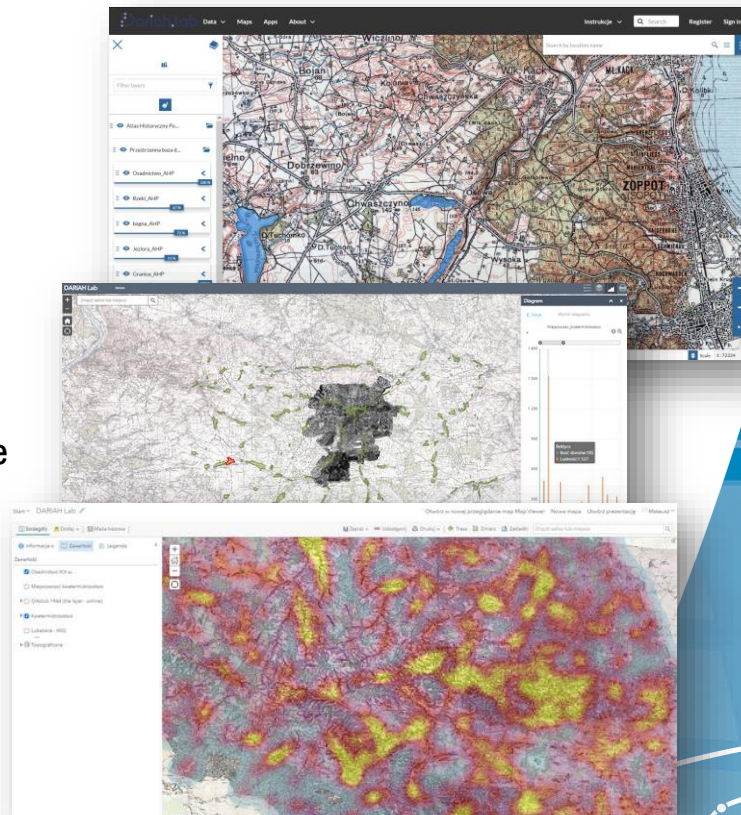
Geospatial data and
geostatistics

- Processing and multicriteria data analysis
- Interactive data interpretation
- Support for
 - data modeling
 - database development
 - visualization
 - qualitative and quantitative analysis
 - development of data processing algorithms

Historical Data Processing, Visualization and Sharing

Application of modern processing, visualization and distribution techniques to historical data for coherent **representation of the history of a place and its changes over time**

- **spatial data analysis with geomatic tools**
- establishing relations between descriptive and numerical data with reference layers such as administrative units or geographical names
- automation of distance analysis, aggregates calculation, space segmentation methods and calculation of synthetic indicators of phenomena related to spatial fields



Visualization Tailored for Presentation of Content Generated in Dariah.lab Laboratories

2D research data
visualization

3D VR visualization

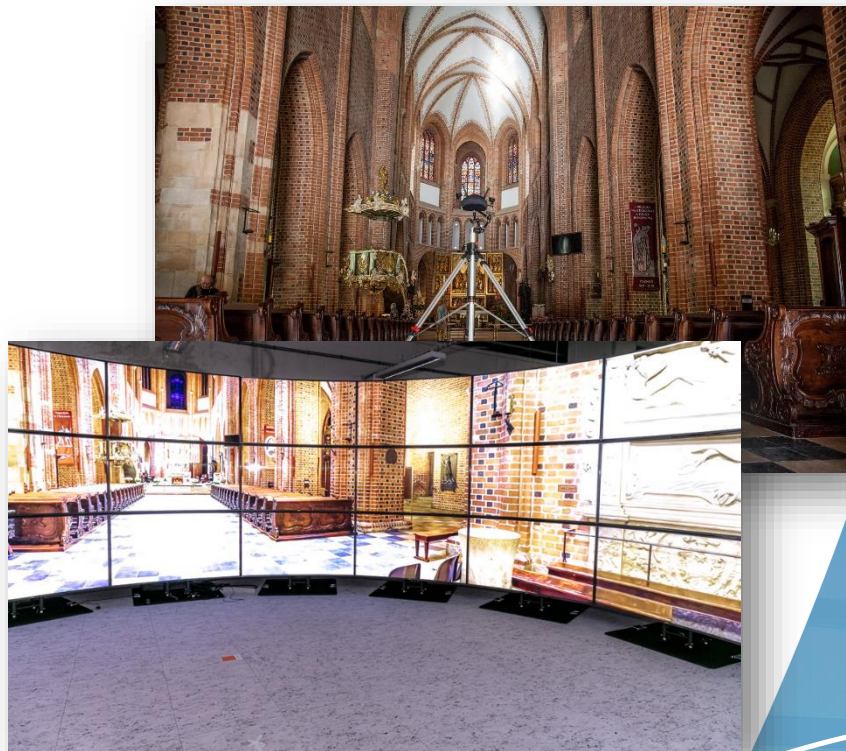
Geospatial visualization

- Large format high-resolution HDR visualization
- 2D and 3D visualization
 - visualization of point clouds with the ability to embed static and multimedia content (video clips, ambisonic sound) in the virtual space
 - presentation of 2D content scans (paintings, old prints) and high-quality photographs in the form of a virtual gallery
- Geospatial visualisation
 - cartographic visualization of spatial data in the form of multilayer maps
- Physical visualisation (e.g. 3D printers)

Virtualization and Visualization of Cultural Heritage Resources

Support for automatic **generation of 3D, 360° and VR visualizations** of cultural heritage objects based on their digital representation (point clouds, 3D models, scans, photos, video and audio recordings) and metadata

- research data visualization
- attractive form of cultural heritage presentation for general audience - virtual tours/galleries





Poznańskie Centrum
Superkomputerowo-Sieciowe

61-139 Poznań

ul. Jana Pawła II 10

tel: (+48 61) 858-20-01

fax: (+48 61) 852-59-54

office@man.poznan.pl

www.pcss.pl

