NVO987 Decentralized Research Infrastructure
Concept, Architecture and Operational Framework

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1. Introduction

The NVO987 project is an independent research initiative that explores the technological possibilities of the open web in order to develop new forms of research, publication and knowledge representation. The aim of the project is to create a digital research infrastructure built on the principles of the decentralized web, enabling research processes, data and publications to appear in a unified, structured and machine-processable form.

Traditional research infrastructures are often tied to institutional systems, databases or closed publication platforms. Although these systems play an important role in scientific communication, they often limit the transparency of the research process, long-term accessibility and interoperability of data.

The NVO987 project examines how the infrastructure of the open web can be used as a research environment. The system is based on a multi-node architecture in which identity, research notes, data and publications appear within interconnected digital structures.

The project can be interpreted as an experimental model that investigates how decentralized identity, semantic web technologies and the principles of open science can be integrated into a unified research infrastructure.

2. The Concept of Decentralized Research Infrastructure

One of the fundamental ideas behind the NVO987 infrastructure is that research systems do not necessarily require centralized platforms. The open architecture of the web makes it possible to create decentralized systems in which research identity, publications and research data operate on interconnected yet independent nodes.

In this model, research is not merely a sequence of publications but a continuously expanding knowledge structure. Research notes, analyses, experiments and publications appear within an interconnected knowledge network that allows better documentation and transparency of the research process.

The project aims to create an environment where research identity, research data and publications are directly connected through the infrastructure of the web itself. This approach may become particularly important in the future, as artificial intelligence and automated data processing play an increasingly significant role in scientific research.

3. Digital Identity

The central element of the infrastructure is a decentralized digital identity that provides the connection between the different components of the system. The identity is based on a decentralized identifier system that allows unified referencing of the researcher, research projects and publications.

The decentralized identity makes it possible for the different nodes of the research infrastructure to reference a common authenticated identity. This ensures the integrity of the system and the relationships between the data.

The identity infrastructure contains metadata related to the researcher, identifiers and services associated with the research system.

4. System Architecture

The NVO987 infrastructure is based on a modular architecture. The system consists of several separate domains, each performing a defined function within the research environment.

The main nodes are the following:

- nvo987.us – central entry point of the infrastructure
- identity.nvo987.us – digital identity and metadata services
- knowledge.nvo987.us – knowledge archive and semantic data structures
- lab.nvo987.us – experimental research environment
- art.nvo987.us – publications and cultural content
- social.nvo987.us – communication node
- web3.nvo987.us – technical documentation

This structure allows the different functions of the research system to operate independently while remaining interconnected.

5. Research Methodology

The NVO987 project operates as an interdisciplinary research environment. The research connects several fields, particularly the study of visual culture, the investigation of digital infrastructures and artificial intelligence-based image analysis.

The research process consists of several stages:

- research notes and documentation
- analysis and interpretation
- publication of experimental results
- preparation of studies and publications
- integration of research results into the knowledge graph structure

This process allows research to appear not only in the form of final publications but also enables the entire research process to be documented.

6. Data Model

The infrastructure is based on semantic data models. Data appears in structured metadata formats that allow the representation of relationships between different research elements.

The main entities of the system are the following:

- person (researcher)
- research project
- dataset
- publication or creative work
- organization

Data appears in structured formats that allow machine processing of the research system and interoperability between different systems.

7. Dataset Documentation

The NVO987 project also publishes machine-processable datasets. These files contain metadata, relationships and structural descriptions of the research infrastructure.

The purpose of the datasets is to make the structure of the research infrastructure interpretable for automated systems. This is particularly important for future data-processing systems and artificial intelligence technologies.

8. Research Ethical Principles

The NVO987 project is based on the principles of open science and ethical research. The project recognizes the fundamental importance of human rights, cultural diversity and scientific freedom.

The aim of the research is the open sharing of knowledge and the creation of a research environment that respects human dignity and cultural differences.

9. Open Science

The project follows the principles of open science. Research results, publications and data appear in an open access environment that allows broader accessibility of research.

The core principles of open science include transparency, data sharing and the reproducibility of research processes.

10. Citation

The NVO987 infrastructure can be cited as follows:

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https://nvo987.us

11. Development Roadmap

The project is a continuously evolving research infrastructure.

The current phase of development focuses on the establishment of the identity infrastructure, the knowledge graph and the publication environment.

Future developments may include:

- expansion of the knowledge graph
- automated research tools
- artificial intelligence based analysis systems
- long-term archiving of research data

12. Conclusion

The NVO987 project is an independent research experiment that uses the open infrastructure of the web as a research environment. The aim of the project is to explore how decentralized identity, semantic data structures and the principles of open science can be integrated into a unified digital research infrastructure.

The system functions not only as a publication platform but as a research ecosystem in which every element of the research process can be documented and interconnected.

The NVO987 infrastructure can therefore be interpreted as an experimental model for investigating future digital research infrastructures.