International Conference "Common Digital Space of Scientific Knowledge: Problems & Solutions" (CDSSK–2020)

Alexander Elizarov[1[0000-0003-2546-6897]], Nikolay Kalenov[2[0000-0003-5269-0988]], Alexander Sotnikov[3[0000-0002-0137-1255]]

[1] Kazan (Volga Region) Federal University, Kremlyovskaya ul., 18, Kazan, 420008, Russia

[2, 3] Joint Supercomputer Center of Russian Academy of Sciences – Branch of Federal State Institution "Scientific Research Institute for System Analysis" of Russian Academy of Sciences, Leninskiy pr., 32a, 119334, Moscow, Russia

[1] amelizarov@gmail.com, [2]nkalenov@jscc.ru, [3]asotnikov@jscc.ru

Abstract. We present a collection of selected materials from the International Conference "Common Digital Space of Scientific Knowledge: Problems & Solutions" (CDSSK–2020), which took place on November 10–12, 2020 at Joint Supercomputer Centre of Russian Academy of Sciences in Moscow, Russia. The aim of this conference is to bring together leading researchers in the field of information systems, digital libraries, science management, ontology modeling, semantic web applications for knowledge exchange, discuss of original research results, new ideas and open research questions.

Keywords[1]: Scientific information, Digital Knowledge space, Ontologies, Information provision, CDSSK–2020.

1 Introduction

We are pleased to present a collection of selected materials to the International Conference "Common Digital Space of Scientific Knowledge" (CDSSK–2020), which took place on November 10–12, 2020 in Joint Supercomputer Centre of Russian Academy of Sciences (Moscow, Russia).

The goal of this conference is to bring together leading researchers in the field of information systems, digital libraries, science management, ontology modeling, semantic web applications. The conference is providing an excellent forum for dissemination

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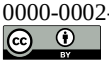
EMAIL: amelizarov@gmail.com (A. M. Elizarov); nekalenov@mail.ru (N. E. Kalenov); asotnikov@jscc.ru (A. N. Sotnikov)

ORCID: 0000-0003-2546-6897 (A. M. Elizarov); 0000-0003-5269-0988 (N. E. Kalenov); 0000-0002-0137-1255 (A. N. Sotnikov)



of original research results, new ideas and practical development experiences which concentrate on both theory and practices.

The conference is based on the success of the workshops “Information support of science: new technologies”, which were held more than 10 last years with publishing of special collections (last one is “Informatsionnoye obespecheniye nauki: noviye tekhnologii”: sbornik nauchnykh trudov. Yekaterinburg: Izdatel’stvo UMTS UPI, 2018. 156 p. ISBN 978-5-8295-0609-4).

The CDSSK–2020 conference addresses the following topics:

- system-wide issues of CDSSK design,
- integration of digital resources of memory institutes (libraries, museums, archives);
- CDSSK formation: linguistic problems;
- legal aspects of information resources integration and provision;
- modern technologies for the formation of information resources;
- software and technology support of CDSSK.

The conference website can be found here: http://dirsmsc.ru/konf/eng/. Presentations and video recording of the reports are available on the site.

2 Program committee and reviewers

1. **Jaakkola Hannu**, Professor, Tampere University of Technology, Tampere, Finland.
2. **Thalheim Bernhard**, Professor, Christian-Albrechts-University, Kiel, Germany.
3. **Nixon Muganda Ochara**, Professor, University of Venda, South Africa.
4. **Guskov Andrey**, Cand. Sc., State Public Library for Science and Technology of Siberian Branch of RAS, Novosibirsk, Russia.
5. **Elizarov Alexander**, Dr. Sc., Kazan (Volga Region) Federal University, N.I. Lobachevskii Institute of Mathematics and Mechanics, Kazan, Russia.
6. **Kalenov Nikolay**, Dr. Sc., Joint Supercomputer Centre of Russian Academy of Sciences, Moscow, Russia.
7. **Serebriakov Vladimir**, Dr. Sc., Computing Center FRS “Computer Sciences and Control” of Russian Academy of Sciences, Moscow, Russia.
8. **Sotnikov Alexander**, Dr. Sc., Joint Supercomputer Centre of Russian Academy of Sciences, Moscow, Russia.

3 Contributions

A peer-reviewed process was carried out to select the workshop papers. At least three members of the Program Committee with expertise in the area reviewed each paper. There were 68 papers submitted for peer-review to this workshop. Out of these, 14 papers were accepted for this volume, 6 as regular papers and 8 as short papers.

Abramov, Evseev, Gonchar and Shabanov presents general information on the architecture of the National Research Computer Network (NIKS), operated and developed by Joint Supercomputer Centre of Russian Academy of Sciences. The structure of

the service platform of NIKS in the context of the current state and development prospects, the opportunities provided by NIKS for enhancement of a common digital space of scientific knowledge are presented.

Ataeva, Kalenov, Serebriakov and Sotnikov presents infrastructure of the common digital space of scientific knowledge as a system of knowledge from various fields of science tested by the scientific community. They consider the ontology of CDSSK, levels of design and functionality of the CDSSK software environment, basic technological requirements for CDSSK.

Ataeva, Serebriakov and Tuchkova describe the role and challenges of the digitalization process in the preservation and development of scientific schools The paper discusses the problem of supporting information images of traditional scientific schools and their development in the digital space.

Elizarov and Lipachev presents the results of the development of a range of semantic services for the integrated management of electronic scientific collections. The goals of these developments are the formation of a unified digital space of mathematical knowledge, as well as information support for research activities in the field of mathematics and computer science.

Gafurova, Elizarov and Lipachev proposed algorithms for the formation of metadata of documents of unstructured digital mathematical collections by the method of search queries to such open scientific resources of the Web as DBPedia, Wikidata, Wikipedia, Freebase.

Glushanovskiy and Vlasova presents analysis of Russian publication for “Computer science” in Web of Sciences flow. Current State and Evolution of different types of documents for last 10 years are considered.

Kalenov, Savin and Sotnikov discuss the general issues of creating CDSSK as a modern integrated structure focused on supporting the tasks of information provision for science and education, collecting, storing and popularizing knowledge reflected in various digital objects.

Lopatina and Sobolevskaya formulate and analyze actual theoretical and methodological problems that require operational solutions in the context of CDSSK designing.

Lopukhina, Rybakova and Kirillov presents the methods of formation and presentation of digital objects of various types (printed publications, archival materials, museum objects, audio and video materials). These methods are used when filling the Digital Library “Scientific Heritage of Russia” (http://heritage1.jscc.ru) as a model of the CDSSK.

Malakhova, Vtorov and Kirillov presents information system “History of Geology and Mining” as a resource for the digital space of scientific knowledge.

Pogorelko presents a new version of the software for the information system “Scientific Heritage of Russia”. The paper describes the decisions taken during the implementation of the software and the modernization of the data structure.

Skvortsov presents the review of solutions for data interoperability and reuse in research infrastructures. It is shown that conceptual modeling based on formal domain specifications still has good potential for data reuse in research infrastructures.

Sobolevskaya presents the technology for representing digital 3D models in the environment of a common digital space of scientific knowledge. Examples of using new

technological solutions for transferring images of physical objects into virtual space are given.

Vlasova presents new web-system for creating and maintaining a database for recording the results of scientific activities. The system includes two modules. The administrative module is intended for entering and editing data. The user module is a special search engine that searches for information, visualizes it, navigates through related resources and exports data.