Digitization of Mathematical Editions in Serbia

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Abstract

We describe an ongoing project carried out by the Mathematical Institute of Serbian Academy of Sciences and Arts, and the Faculty of Mathematics, Belgrade. The project concerns building of electronic resources and presentations of electronic editions of mathematical works in Serbia, including retro-digitization of old books, articles and the other mathematical works, and development of the corresponding virtual library. The resources built in the project are freely accessible through Internet.

Importance of digitization

Digitization of cultural heritage is today one of the crucial components of learning about our history and culture on the local level as well as teaching the others about ourselves and ourselves about the others on the international level.

Digitized scientific works is one of the most helpful resource and tool for scientific works and fast exchange of scientific information. Also, we understand that every scientific work becomes after some time the part of history and the part of cultural heritage as well.

Here are some other advantages:

- We may consider digital environment is the space of expression, communication, experience, attitudes and value exchange.
- It allows easy and fast accessibility to resources.
- It admits networking capability and exchange of data.
- It gives new services based on information technologies.
- Protection of scientific and cultural values.

Importance of information technologies in digitization

- Use of computers and computer related equipments.
- Networking and Internet.
- Building appropriate databases.
- Development of software.
- Development of standards and metadata for digitized items.

Goals of our Project

- Development of standards and metadata for digitization.
- Development of computer technologies, software and database specific for digitization.
- Scientific research of theoretical disciplines on which digitization is founded.
- Cooperation in this area with similar groups and projects from the countries in the South-Eastern Europe (Balkan).

Achievements

A group of mathematicians in Belgrade started several initiatives and subprojects in the area of digitization and the Group is now recognized not only in Serbia, but also at international level. Leaders of all these projects are Žarko Mijajlović (Faculty of mathematics in Belgrade) and Zoran Ognjanović (Mathematical institute of the Serbian Academy of Science and Art).

- **Virtual Library**, http://elibrary.matf.bg.ac.rs
which includes several hundred old and rare books in mathematical sciences written by Serbian authors and most of doctoral dissertations in mathematics, astronomy and mechanics written at the Belgrade University. This is the largest Serbian digital library. It has in its repository about 600 hundred books and about 350 doctoral dissertations in mathematical sciences. Access to the Virtual library is open to the general public.

- **E-Library of Serbian mathematical journals**, http://elib.mi.sanu.ac.rs, which contains, for example, the complete digitized collection (since 1932 when the journal was founded) of the leading and oldest Serbian mathematical journal:

     Publications de l'Institut Mathématique.

Now it includes nine Serbian mathematical journals.

These two projects are oriented towards **Digital mathematical library**, a World project on which works many World institutions.

The final aim of this project is the fulfillment of a **mathematical dream of a digital archive** containing all peer-reviewed mathematical literature ever published, properly linked and validated (verified).

- **Publishing.** We are publishing *NCD Review*, http://elib.mi.sanu.ac.rs, a scientific journal in the area of digitization. The journal was founded in 2003, 14 volumes appeared until now; it is published in English and has the international editorial board.

  Occasionally we publish electronic books; mainly collected works of recognized Serbian scientists in the area of mathematical scientists. We published the following digital books of this kind:

  - *Collected works of acad. Bogdan Gavrilović,*
  - *Collected works of professor Dušan Adamović,*
  - *Collected works of professor Jovan Simovljević,*
  - *Collected works of acad. Vojislav Mišković.*

- **International cooperation**, in particular with the neighboring countries. Serbia is one of the founders of SEEDI (South-Eastern European Digitization Initiative), an international organization which gathers Balkan countries in the area of digitization.

  We organized 3 international and 8 national conferences since 2000, all related to digitization.

  Members of our group published more than 100 scientific papers in this area, most of them presented on international conferences.
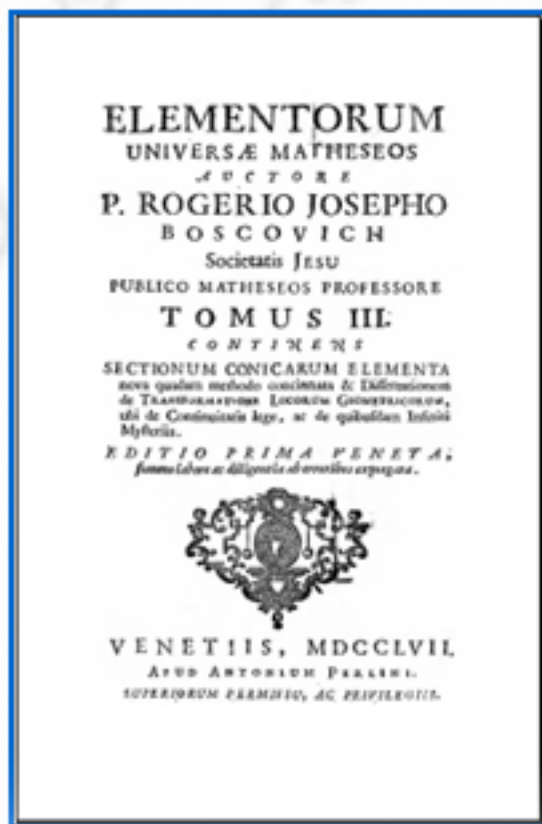
VIRTUAL LIBRARY

data base of textual data

The overall aim for the digital library is to create a comprehensive and semantically interconnected collection of retro-digitized books and other digital documents. Objectives of the project include electronic archiving of old manuscripts then their publishing in electronic phototype form and presentation to the general audience. Our proposal is mathematically inclined, more specifically the project is concerned with digitization of old books and other manuscripts satisfying the following criteria:

1. Books and other manuscripts contained in Serbian public and semi-open libraries. By semi-open libraries we mean departmental libraries and private collections.
2. Books and manuscripts selected for digitization should be mainly with topics in mathematical sciences: mathematics, mechanics, astronomy, physics and mathematical geography.
3. Books considered for digitization should be published before certain date in the past, for example First World War (1914).
4. Preference will be given to Serbian authors, or to works somehow related to Balkan area.

There are relatively large collections of rare books in our libraries. For example, the Mathematical Faculty in Belgrade has in it's possession about 500 mathematical books published in 19. century or before. On the other hand, just few of them can be found in the joint catalogs of the network of largest Serbian libraries (that include the National Library and all university libraries). Some of these books are rather rare and it is known that there are left only few copies of them in the printed form. We think that it is very important to preserve them in some form. Not only as a cultural or scientific heritage important for our local community but also as a part of the World heritage. We decided to

Ruđer Bošković, *Elementorum Universae Matheseos - Tomus III*, Venetiis, 1757.

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AUCTORE
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BOSCOVICH
Societatis JESU
PUBLICO MATHESEOS PROFESSORE
TOMUS III.
CONTINENS
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nova quadam methodo concinnata & Differtationem
de Transformatione Locorum Geometricorum,
ubi de Continuitatis lege, ac de quibusdam Infiniti
Myfteriis.
EDITIO PRIMA VENETA;
fumma labore ac diligentia ab erroribus expurgata.

VENETIIS, MDCCLVII.
APUD ANTONIUM PERLINI.
SUPERIORUM PERMISSU, AC PRIVILEGIIS.

Elektronsko izdanje knjige Vasilija Damjanovića "Aritmetika" je zajedničko izdanje Biblioteke Matice srpske i Matematičkog instituta SANU koje je pripremljeno na osnovu originalnog primerka koji se čuva u Biblioteci Matice srpske.

Milutin Milanković, **KANON**, Beograd, 1935.

COMPLETE LIBRARY

Authors

Collections

- Books
- Scientific papers
- Dissertations

Master and PhD thesis on the Faculty of Mathematics, University of Belgrade

- Master of Sciense
- PHD

001152

Dimitrije Danić: *Konformno preslikavanje eliptičnog paraboloida na ravan*, Jena, 1885.

Bogdan Gavrilović: *Formiranje jednoznačnih analitičkih funkcija*, Budapest, 1886.

Đorđe Petković: *Abelova teorema dokazana algebarski pomoću Riemann-ove teorije funkcija*, Beč, 1893.

Mihailo Petrović: *Sur les zéros et les infinis des intégrales des équations différentielles algébriques*, Paris, 1894.

Petar Vukićević: *Die Invarianten der Linearen Homogenen Differential-Gleichungen n^{TER} Ordnung*, Berlin, 1894.

Mladen Berić: *Figurativni poligoni diferencijalnih jednačina prvog reda*, Beograd, 1912.

Sima Marković: *Opšta Riccati-eva jednačina prvog reda*, Beograd, 1913.

Konstantin Orlov: *Aritmetičke i analitičke primene matematičkih spektara*, Beograd, 1934.

Ruđer Bošković: *Elementorum Universae Matheseos - Tomus II*, Venetiis, 1757.

Ruđer Bošković: *Elementorum Universae Matheseos - Tomus III*, Venetiis, 1757.

Vasilije Damjanović: *Aritmetika* 1767.

Jovan Došenović: *Čislenica*, Budim, 1809.

M. J. Andonović: *Kosmografija*, Beograd, 1888.

Kosta Stojanović: *Atomistika*, Niš, 1892.

Bogdan Gavrilović: *Analitička Geometrija*, Beograd, 1896.

Mijalko V. Ćirić: *Racionalna Mekanika(Sveska prva)*, Beograd, 1897.

Bogdan Gavrilović: *Teorija determinanata*, Beograd, 1899.

Milutin Milanković: *Nebeska mehanika*, Beograd, 1935.

Milutin Milanković: *Kanon Der Erdbestrahlung*, Beograd, 1941.

Miloš Radojčić: *Elementarna Geometrija*, Beograd, 1961.

http://elib.matf.bg.ac.yu:8080/elib/documentSearch.html

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D106937/BOOK/JURAJ CARIĆ/ZAGREB/20456	Slike iz pomorskoga života	09.02.2009	☐	📄	☐	
D106937/BOOK/MILUTIN MILANKOVIĆ/BEOGRAD/20452	Kroz vasionu i vekove	05.02.2009	☐	📄	☐	
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eLibrary of Mathematical Institute
of the Serbian Academy of Sciences and Arts

Welcome

The aims of this eLibrary are to improve:

- online presence and long-term preservation of scientific journals printed in Serbia,
- exchange of information in mathematics and the related fields.

Our repository contains:

Journal	Issues	Papers
Bulletin, Classe des Sciences Mathématiques et Naturelles, Sciences mathématiques	8	65
Kragujevac Journal of Mathematics	10	172
Matematički Vesnik	35	313
Nastava Matematike	35	286
Review of the National Center for Digitization	13	160
Publications de l'Institut Mathématique	104	2081
The Teaching of Mathematics	21	94
Total: 7 Journals	**226**	**3171**

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This volume contains papers presented at the fourth SEEDI Conference Digitization of cultural and scientific heritage, Belgrade, Serbia, June 12-15, 2008

The making of … digital books
1 - 8
Nikola Ikonomov and Milena Dobreva
Abstract

> Keywords: digitization, scanning, image processing, image enhancement, OCR

A software tool for searching in binary text images
9 - 16
Nikolay Kirov
Abstract

Some IT aspects of building digital libraries with learning materials
17 - 21
Pavel I. Pavlov and Maria M. Nisheva-Pavlova
Abstract

> Keywords: Digital Library, Electronic Publishing, Metadata, Semantic Annotation, Ontology, Semantic Web

Selective encryption of Huffman compressed text
22 - 26
Miodrag Živković
Abstract

> Keywords: selective encryption, ciphertext-only attack, randomness test

On photograph library design - Groman library
27 - 36
Saša Malkov
Abstract

> Keywords: digital library, photography, design

Digitization, preservation and presentation - Serbian sound heritage
37 - 40
Vesna Aleksandrović
Abstract

> Keywords: Digitization, Sound recordings, Cultural heritage, Database, Interface, Sound archive, Sound restoration