UDC 001.89(477):519.7

OPEN SCIENCE IN UKRAINE: OPEN CLOUD MATHEMATICS

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Abstract. *One of the very important services that are essential for the scientific community is cloud math. We propose to use our open cloud mathematical platform MathPartner. It is a ready-made universal mathematical tool that can be connected as a service to the EU Open Science Platform.*

Keywords: *cloud mathematical platform, universal mathematical tool, MathPartner, Open Science Platform, symbolic and numerical computations.*

Introduction: sciences and mathematics

In natural sciences and technical sciences, the main part of scientific work is mathematical calculations. The mathematical tools available to the researcher are a very important factor affecting the productivity of his scientific work.

Today, commercial products are used: MAPLE (Maplesoft.com), Mathematiica (Wolfram.com), and others. They are used in many universities and scientific organizations. For example, the Mathematiica package was purchased from the Institute of Theoretical Physics of the National Academy of Sciences.

The creation and development of convenient mathematical tools is the most important task to be addressed by the management of the European Open Science Project.

Methods: computer algebra systems

Computer mathematics systems are also called symbolic computing systems or computer algebra systems. They began to develop more than fifty years ago. The «Analyst» language for the MIR-1 computer was developed in Kyiv at the Institute of Cybernetics of the National Academy of Sciences of Ukraine under the direction of V.M. Glushkov. It is rightfully considered one of the first systems of computer algebra. Another package of computer algebra was developed in Kyiv under the guidance of his student A.A. Letichevsky [1]. At the same time, computer algebra began to develop at Lviv and Kiev universities, at the Institute of Applied Problems of Mechanics and Mathematics. The algorithms developed at that time formed the basis of the MathPartner cloud mathematics software package.

Today, this cloud mathematics project is being developed at the Faculty of Computer Sciences at the National University of Kyiv-Mohyla Academy.

The project platform is deployed in our university on the server of the Faculty of Computer Scences at http://mathpar.ukma.edu.ua [2].

This service has free user access. Users can find out all its features using the User's Guide, which is uploaded on this site, through its Help Pages, as well as using hints from the left side bar.

Research results: MathPartner cloud mathematics

There are a number of articles in scientific journals that are devoted to MathPartner project [3], [4], [5], [6]. They highlight its advantages over known commercial systems mentioned above.

This cloud service is a new generation of computer mathematics systems. All his programs were developed in environment Java, in the Linux operating system. The user's language is as close as possible to the usual mathematical notation. Its original form is a certain dialect of LaTeX. This language is well known to everyone who publishes papers on mathematics or physics. It is easily accepted by schoolchildren and students.

Today this service is used in the educational process at three Kyiv universities: our university, Kiev Academic University and the National University of Life and Environmental Sciences.

Further development of this universal mathematical tool requires international cooperation. It is required to create a joint team with organizations working in the field of symbolic calculations and computer algebra. In addition, it is necessary to transfer this project from the server of our faculty to a server that is easily scalable to a large number of users.

This report aims to draw attention to the problem of creating mathematical tools within the framework of the Open Science Europian Project. It is addressed to both the project management and all potential partners interested in creating a joint team.

Conclusions: the ready-made open mathematical tool

It is impossible to imagine an Open Science Platform that would not present mathematical tools in the most general and convenient form.

The MathPartner open cloud mathematical platform, which is being developed at our university, is a ready-made universal mathematical tool that can already be connected as a service to the EU Open Science Platform .

We propose to create a MathPartner laboratory on the basis of our university as part of the Open Science Project. The task of this laboratory will be the support and development of this service. And it could include teams from other universities interested in the development of such a mathematical service.

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ВІДКРИТА НАУКА В УКРАЇНІ: ВІДКРИТА ХМАРНА МАТЕМАТИКА

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Анотація. *Одним із дуже важливих сервісів, необхідних науковому співтовариству, є хмарна математика. Ми пропонуємо використовувати нашу відкриту хмарну математичну платформу MathPartner. Це вже готовий універсальний математичний інструмент, який можна підключити як сервіс до Open Science Platform ЄС.*

Ключові слова: *Хмарна математична платформа, універсальний математичний інструмент, MathPartner, Open Science Platform, символьні та числові обчислення.*