

Ministry of Science and Higher Education of the Russian Federation

IEEE All-Russian Information Theory Society

Regional IEEE Russia (Siberia) Section

Penza State University

Parul University (India)

Open Solutions LLC

26th International Scientific and Technical Conference

**PROBLEMS OF COMPUTER SCIENCE
IN EDUCATION, MANAGEMENT,
ECONOMY AND TECHNOLOGY**



Penza, Russia

13 – 14 November 2026

ORGANISING COMMITTEE OF THE CONFERENCE

Chairperson

A.V. Kuzmin Doctor of Engineering Sciences (Penza, Russia)

Co-chairperson

P.S. Rybin Candidate of Physics and Mathematics, Head of IEEE All-Russian Information Theory Society (Moscow, Russia)

IEEE Siberia (Novosibirsk, Russia)

Khazankin G.R. Head of Regional IEEE Russia (Siberia) Section

Nikulin A.V. Deputy Head of Regional IEEE Russia (Siberia) Section

Kazmina A.S. Head of student branch (ED15) IEEE Russia (Siberia) Section

Members

Rajaswaran Logeswaran Doctor of Sciences, Professor (Kuala Lumpur, Malaysia)

Anand Joshi Doctor of Philosophy, Professor (Vadodara, Republic of India)

A.M. Nedzved Doctor of Engineering Sciences, Professor (Minsk, Belarus)

A.N. Kurbatsky Doctor of Engineering Sciences, Professor (Minsk, Belarus)

B.S. Akhmetov Doctor of Engineering Sciences, Professor (Almaty, Kazakhstan)

N. Petrović Doctor of Engineering (Novi Sad, Serbia)

S. Boroevich Doctor of Philosophy (Banja Luka, Bosnia and Herzegovina)

V.P. Kulagin Doctor of Engineering Sciences, Professor (Moscow, Russia)

O.E. Iaremko Doctor of Physics and Mathematics (Moscow, Russia)

N.A. Obukhova Doctor of Engineering Sciences, Professor
(St. Petersburg, Russia)

S.V. Bezzateev Doctor of Engineering Sciences, Professor
(St. Petersburg, Russia)

A.V. Ivashchenko Doctor of Engineering Sciences, Professor (Samara, Russia)

O.K. Golovnin Doctor of Engineering Sciences (Samara, Russia)

A.N. Stepanov Doctor of Physics and Mathematics, Professor (Samara, Russia)

Ia.E. Romm Doctor of Engineering Sciences, Professor (Taganrog, Russia)

A.L. Priorov Doctor of Engineering Sciences (Yaroslavl, Russia)

A.Yu. Meygal Doctor of Medicine, Professor (Petrozavodsk, Russia)

Yu. G. Smirnov Doctor of Physics and Mathematics, Professor (Penza, Russia)

Yu. N. Kosnikov Doctor of Engineering Sciences, Professor (Penza, Russia)

V.I. Gorbachenko Doctor of Engineering Sciences, Professor (Penza, Russia)

M.M. Butaev Doctor of Engineering Sciences, Professor (Penza, Russia)

V.V. Khryashchev Doctor of Engineering Sciences, Director of point of View LLC
(Yaroslavl, Russia)

I.V. Kulkov Director General of Open Solutions LLC (Penza, Russia)

Secretary

V.V. Drozhdin Candidate of Engineering Sciences, Associate Professor
(Penza, Russia)

TOPICS THE CONFERENCE:

1. Computer science:

- mathematical simulation and information modelling
- knowledge management models
- fuzzy models
- artificial intelligence
- adaptive information systems
- models of digital economy and knowledge economy
- ontological adaptive programming of business processes

2. Machine learning and neural networks:

- theory of machine learning and neural networks
- neuromathematics
- applications of machine learning and neural networks

3. Theoretical and applied programming:

- programming languages and technologies
- generative programming
- cloud computing
- Web- programming
- programming mobile devices

4. Information technology:

- modern information technologies
- problems of information transmission and protection
- data mining
- internet of things
- digital twin technology
- computer graphics in information systems and spaces

5. Information systems and technologies in medicine:

- modelling of business processes in medical organizations
- problems of developing and applying information systems in medicine
- information technologies and computer modelling in medicine
- telemedicine technologies

6. System design:

- design of software, information, information and measurement, control systems
- software project management
- ensuring quality of software and information systems

7. Applied aspects of computer science:

- modelling production and business processes
- information technologies in management, economy and technology
- information systems and technologies in education and social life

FORMS OF PARTICIPATION

- plenary presentation (15 min.)
- session presentation (10 min.)
- participation as an audience member

TERMS OF PARTICIPATION

To participate in the conference, it is necessary to send the texts of articles and the application with the data of all co-authors at e-mail probinf@yandex.ru or upload it on <https://pics.ieeesiberia.org>. The deadline is **20 October 2026**.

The working languages at the conference are **Russian** and **English (For IEEE proceedings English only)**.

The originality of the article texts should be at least 70% (according to the website antiplagiat.ru).

The reports are selected by the organising committee for inclusion in the conference agenda and publication in the conference proceedings, the refusal is not explained.

By the beginning of the conference, an **electronic version of the conference proceedings** will have been issued with the assigned international ISSN number and UDC / LBC codes.

At the end of the conference, the proceedings will be posted in the Scientific Electronic Library (**eLIBRARY.RU**) and included in the Russian Science Citation Index (**RSCI**), as well as sent to the conference participants by e-mail, the hard copies (if applicable) will be sent by post at the indicated addresses. **IEEE proceedings will be published separately (IEEEExplore indexed)**

The selected reports will be recommended by the organising committee for publication in the open access journal “**Models, Systems, Networks in Economics, Engineering, Nature and Society**” (Russian State Commission for Academic Degrees and Titles https://mss_eng.pnzgu.ru).

There is **no organizational fee** for ordinary participation (RSCI proceedings).

IEEE publication requires **organizational fee** according to <https://pics.ieeesiberia.org>

GUIDELINES FOR RSCI (Non IEEE) SUBMISSION AND PUBLICATION

1. The article should be submitted in A4 format 210 x 297 mm with margins: left margin – 25 mm, right, top and bottom margins – 15 mm. The pages should not contain numbering. The text is drafted in Microsoft Word editor and typed in Times New Roman font, size 14 and 1 interline spacing.

2. At the beginning of the article, the UDC index is indicated. On the next line the title in Russian is printed in capital letters, the font is bold. Below, with 1,5 interline spacing the surname, name, patronymic of the author(s) age given in lowercase letters. Then with 1,5 interline spacing the full name of the organisation / institution, city and country is given. Further, the same data are provided in English. After that, the abstract and keywords in Russian and English are placed.

3. The text of the article may contain formulas, tables and figures. The references are drawn up in accordance with the Russian national references standard GOST R 7.0.100-2018.

4. The text of the article in Russian or English with a volume of 3-4 pages should be given in a separate file named by the name of the first author and the first three words of the title of the article.

Should you have any questions, please contact the secretary of the organising committee Drozhdin Vladimir Viktorovich (tel: +7 937 429 79 40, e-mail: probinf@yandex.ru) website: <http://probinf.ru/>

APPLICATION FOR PARTICIPATION IN THE CONFERENCE

Full name	
Workplace, position, academic degree, academic title	
Address	
Telephone number	
E-mail	
Title of the article	
Number of printed copies (if needed)	

УДК 004.9

**МОДЕРНИЗИРОВАННЫЙ АЛГОРИТМ ОБУЧЕНИЯ ВЕСОВ
РАДИАЛЬНЫХ БАЗИСНЫХ НЕЙРОННЫХ СЕТЕЙ
ПРИ РЕШЕНИИ КРАЕВЫХ ЗАДАЧ**

В.И. Горбаченко, Е.В. Артюхина

Пензенский государственный университет,
г. Пенза, Россия

**MODERNIZED ALGORITHM OF TRAINING THE SCALES OF RADIAL
BASIS NEURAL NETWORKS BY SOLVING BOUNDARY EQUATIONS**

Gorbachenko V.I., Artyukhina E.V.

Penza State University, Penza, Russia

Аннотация: Разработан модернизированный алгоритм обучения весов радиальных базисных нейронных сетей при решении краевых задач. Экспериментально показано, что данный алгоритм позволяет сократить время решения задачи по сравнению с алгоритмом сопряженных градиентов для минимизации квадратичного функционала.

Ключевые слова: радиальная базисная сеть, нейронная сеть, алгоритм обучения

Abstract. Modernized algorithm of training the scales of radial basis neural networks by solving boundary equations is worked out. It is experimentally proved that this algorithm allows of reduction the time for solving the tasks in comparison with the algorithm of conjugated gradients for minimization of the quadratic functional.

Keywords: radial basic network, neural network, learning algorithm

Radial basic functions neural networks (RBFNNs) find effective application in solving boundary value problems in mathematical physics [1]. The work aims at developing and studying a modernized RBFNN weight training algorithm. We consider learning as illustrated by the Poisson equation

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = f(x, y), \quad (x, y) \in \Omega, \quad u = p(x, y), \quad (x, y) \in \partial\Omega, \quad (1)$$

where $\partial\Omega$ is an area boundary; f and p are known functions (x, y) .

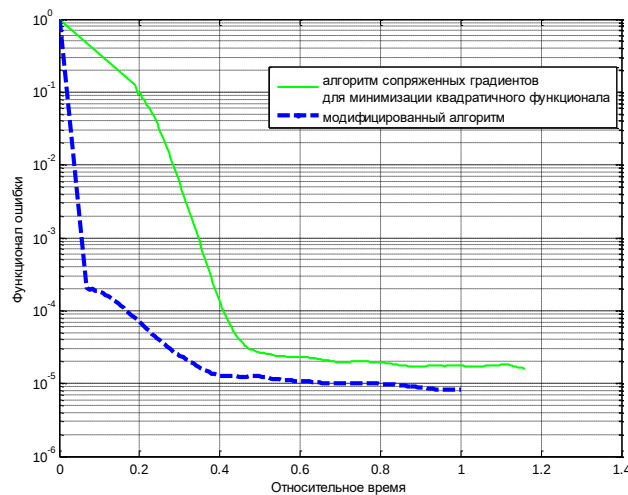


Figure 1 - Comparison of the algorithms

The results of the experiments show that the developed algorithm reduces the problem solving time by about 20% compared to the conjugate gradient algorithm for minimizing the quadratic learning functional of RBFNN weights.

References

1. Numerical solution of elliptic partial differential equation using radial basis function neural networks / L. Jianyu, L. Siwei, Q. Yingjiana, H. Yapinga // Neural Networks, 2003, 16(5/6). – P. 729 – 734.
2. Dennis J. Jr., Shnabel R. Numerical methods of unconditional optimization and solution of nonlinear equations / translated from English. – M.: Mir, 1988. – 440 p.
3. Vorst van der, H. Iterative Krylov Methods for Large Linear Systems. – Cambridge: Cambridge University Press, 2003. – 232 p.
4. Artyukhin V.V., Artyukhina E.V., Gorbachenko V.I. Radial-basic neural networks for solving boundary value problems by meshless methods // Scientific session of National Research Nuclear University MEPhI-2010. 12th All-Russian scientific and technical conference “Neuroinformatics-2010”: proceedings. – M.: NRNU MEPhI, 2010, Part 2. – P. 237 – 247.
5. Arbuzova A.A. Diagnosis of pneumonia by X-ray images using convolutional neural networks // Models, Systems, Networks in Economics, Engineering, Nature and Society, 2021, no. 2. – P. 107 – 114