INTERNATIONAL

INVITED SESSION SUMMARY

Title of Session: **Models in Smart E-Learning System Theory and Practice (MSTP)**

Name, Title and Affiliation of Chair:

Professor Dr. Natalia A. Serdyukova,
Gubkin University, 65 Leninsky Prospekt, Moscow, 119991, Russia
https://www.gubkin.ru/faculty/economics_and_management/chairs_and_departments/financial_management/serdyukova-natalya-aleksandrovna.php

Dr Natalya **V.** Serdyukova
HSE University, 20 Myasnitskaya St., Moscow, 101000, Russia
School of Finance
https://www.hse.ru/org/persons/1012980751

Professor Lakhmi C. Jain,
PhD | ME | BE(Hons)| Fellow (Engineers Aust),
Founder KES International | http://www.kesinternational.org/organisation.php

Details of Session (including aim and scope):

Digital transformation processes cover almost all spheres of our society, forming inextricable links between the real and virtual worlds. The processes of digitalization began with the synthesis of the mathematization of science and practice (the work of the Russian mathematician I. R. Shafarevich in 1970) and the systematic approach discovered by Ludwig von Bertalanffy in 1937. The role of mathematics as a universal language for describing these processes of digitalization and systematization and connections between theory and practice is constantly growing. The implementation of digitalization processes into Smart Education and E - learning is impossible without the concept of Lifelong Learning (continuous learning) and usage main IT technologies in conjunction with the classical principles of pedagogy.
So, the importance of mathematical methodology, Lifelong Learning methodology and methods underlying the digitalization of complex intelligent systems is increasing. Modelling, mathematics, education, economy are the links of this combining. This position determines the choice of invited session scope.

Research papers are invited in all areas related to the Models in Smart E-Learning System Theory and Practice.
The topics of interest include, but are not limited, to:

- Verbal models in Smart E-Learning System Theory and Practice, or models of Pedagogical Theories of the Smart E - Learning System and their practical Implementations.
- Methodology, models, and modern technologies of Lifelong Learning, including generative AI.
- Pedagogical agent-based models (ABM) in human learning systems as modern technologies for improving learning.
- Mathematical models in Smart E-Learning System Theory and Practice, or computational aspects, mechanisms and instruments of Smart E-Learning System Theory and Practice. The scope includes, but are not limited, to:
- Models transfer methods. Mathematics develops along the path of searching for analogies and building generalizations. Transfer of models is a method that helps in searching, substantiating, constructing generalizations and implementing the obtained results from one area of research, both theoretical and practical, to another, based on analogies and the use of mathematical methods,
- Algebraic Methods in Smart E-Learning System Theory and Practice, and, in particular,

methods of the theory of algebraic systems as algebra and logic are currently key areas in digital transformation research and can be seen as the most important mechanisms enabling the strategic, fundamental achievements of digital transformation,
- Probability Methods in Smart E-Learning System Theory and Practice,
- Graph Theory Methods in Smart E-Learning System Theory and Practice,
- Geometric Methods of Smart E-Learning System Theory and Practice,
- Category Theory Methods in Smart E-Learning System Theory and Practice.

The essence of ideology of Pedagogical Theories of the Smart E - Learning System and their practical Implementations can be based, but not limited to the book:

- Mirjana Ivanović, Lakhmi C. Jain, Editors, E-Learning Paradigms and Applications. Agent-based Approach, Studies in Computational Intelligence, Volume 528, Springer-Verlag Berlin Heidelberg, 2014

The mathematical part of the research on the proposed topic can based, but not limited to the ideology developed in the works of A.I. Maltsev, I.R. Shafarevich, Sanders MacLane, Benoit Mandelbrot. To get acquainted with possible technical tools of the session, the following works may be useful:

- I.R. Shafarevich. Basic concepts of algebra. - Izhevsk: Izhevsk Republican Printing House, 1999.
- A.I. Malt'sev. Algebraic systems. - Moscow: Science, 1970.
- Saunders Mac Lane, Categories for the working mathematician, - New York, Berlin, Heidelberg, Springer – Verlag, 1991.
- B. Mandelbrot, The Fractal Geometry of Nature. - San Francisco: W.H. Freeman, 1983.
- N. Serdyukova, V. Serdyukov, Algebraic Formalization of Smart Systems. Theory and Practice, Smart Innovation, Systems and Technologies, Volume 91, - Switzerland, Springer Nature, 2018.
- N. Serdyukova, V. Serdyukov, Algebraic Identification of Smart Systems. Theory and Practice, Intelligent Systems Reference Library, 191, Springer, Nature, - Switzerland, 2021.
- N. Serdyukova, V. Serdyukov, Algebraic Quasi - Fractal Logic of Smart Systems. Theory and Practice, Intelligent Systems Reference Library, 251, Springer, Nature, - Switzerland, 2024.

Timelines:

- 20 Jan. 2026—Paper submission deadline
- 20 Feb. 2026 --Notification to the corresponding author
- 6 March 2026---Camera-ready paper due

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

University of Novi Sad
National University of Higher Education
Gubkin University, Russia
HSE University

Website URL of Call for Papers (if any):

Email & Contact Details:

Professor Lakhmi C. Jain,
PhD | ME | BE(Hons)| Fellow (Engineers Aust),
Email: jainlakhmi@gmail.com

Professor Dr Natalia A. Serdyukova
Gubkin University
65 Leninsky Prospekt, Moscow, 119991, Russia
Email: **nsns25@yandex.ru**

Dr Natalya **V.** Serdyukova
HSE University, 20 Myasnitskaya St., Moscow, 101000, Russia
School of Finance

https://www.hse.ru/org/persons/1012980751
Email: nat200612@yandex.ru