WORKSHOP PROGRAMME

Arrival in the Baikalsk and registration of participants

Welcome Party

March 11, 9:00

OPENING CEREMONY

SESSION 1

1. Perspectives and problems of electric power systems transformations / **Nikolai Voropai** *(Melentiev Energy Systems Institute (MESI) SB RAS, Irkutsk).*
2. Approaches to the development of a digital platform for modeling integrated energy systems / Nikolai Voropai, Valerii Stennikov, Zhou Bin *(Hunan University, Changsha, China),* **Evgeniy Barakhtenko**, Dmitrii Sokolov (*MESI SB RAS).*
3. Algebraic methods of generative design of power systems / **Serge Kovalyov** (*Institute of Control Sciences, Russian Academy of Sciences (ICS RAS), Moscow).*
4. Stratified model of critical information infrastructure of a large-scale information system / **Roman Erzhenin** *(SPC «Gosuchet», Moscow).*
5. An approach to resilience research of energy, environmental and social systems based on the situational management concept and cognitive modeling / Nadezhda Komendantova *(Applied Systems Analysis (IIASA), Laxenburg, Austria),* **Liudmila Massel**, Aleksei Massel *(MESI SB RAS),* Polina Tuktarova *(Ufa State Aviation Technical University (USATU), Ufa).*
6. Resilience research of socio-ecological systems taking into account the quality of life / **Marina Diakovich** *(Angarsk State Technical University (ASTU), Angarsk).*
7. Construction of digital twins and digital images of energy systems and complexes based on the integration of mathematical, semantic and information models **/ Aleksei Massel**, Liudmila Massel *(MESI SB RAS).*
8. Digital twins used for protection against induced voltages **/ Natalya Buyakova** *(ASTU),* Andrey Kryukov *(Irkutsk National Research Technical University (INRTU), Irkutsk State Transport University (ISTU),* Nguyen Ty *(INRTU)*

9. Digital twin of the distributed generation plant / **Yurii Bulatov** (*Bratsk State University, Bratsk*, Andrey Kryukov *(INRTU), (ISTU), Irkutsk*).

10. Electric power systems multifunctional models with power supply lines of new types / **Natalya Buyakova** *(ASTU)*, Andrey Kryukov *(INRTU, ISTU)*, Thao Le Van *(INRTU)*.

11. Network-centric management to increase the efficiency of the demand-response aggregator / Irina Kolosok, **Elena Korkina** *(MESI SB RAS)*.

12. Monitoring and analysis of Scada and WAMS data for EPS digitalization / Irina Kolosok, **Liudmila Gurina** *(MESI SB RAS)*.

13. An approach to assessing the impact of digital technology development on electricity demand in a region / **Elena Galperova**, Vasilii Galperov *(MESI SB RAS)*.

14. Intelligent diagnosis components of the critical infrastructures in electro-energetics / Mikhail Dunaev, Andrey Dunaev *(INRTU),* **Yanina Dunaeva** *(Irkutsk State University (ISU), Irkutsk),* Leonid Arshinskiy *(ISTU)*.

Round Table: **«Problems and Methods of Resilience Research»**

Keynote Speakers: **Liudmila Massel, Irina Kolosok, Marina Diakovich**

March 12, 9:00

SESSION 2

1. Ontological engineering of methodological support of studies on the anthropogenic influence of energy on the environment / **Tatyiana Vorozhtsova**, Elena Maysuyk, Irina Ivanova *(MESI SB RAS)*.

2. Methodological support of studies on the anthropogenic influence of energy on the environment / **Elena Maysuyk** *(MESI SB RAS)*.

3. Energy related technological forecasting: scientometric analysis and critical review / **Aleksei Mikheev** *(MESI SB RAS)*.

4. Intelligent information system for forecasting of energy technology / **Aleksei Kopaygorodsky** *(MESI SB RAS)*.

5. Automation of creating ontologies based on semantic analysis of text data in the energy / **Elena Khairullina** *(MESI SB RAS)*.

6. Methods for developing intelligent tools for cybersecurity monitoring at energy facilities / **Gaskova Daria** *(MESI SB RAS)*.

7. Architecture for the DLT network based on nodes with constrained resources */ **Konstantin Mironov** *(USATU, Ufa)*

8. Typal intelligent DSS for making strategic decisions in the energy sector based on agent-service approach and examples of its application / **Kuzmin Vladimir**, Liudmila Massel *(MESI SB RAS)*.

9. Dynamic cognitive maps as a tool for studying energy security problems / **Dmitrii Pesterev**, Aleksei Massel *(MESI SB RAS)*.

10. Re-engineering the software complex for researches of the problem of energy security / Aleksei Massel, **Timur Mamedov** *(MESI SB RAS)*.

11. Digital platform "Active Citizen" / **Serge Bakhvalov**, Zinaida Bakhvalova *(INRTU)*, Artur Bondarev *(ISU)*.

12. Aspects of building interactive maps to analyze energy infrastructure in different regions of the world / Leonid Trofimov, **Ivan Trofimov** *(MESI SB RAS)*.

13. Protection of critical information in external data stores using the dissection-separation method / **George Surchovetckii** *(ISTU)*.

14. Spacecraft onboard systems design support technology on the basis of the intellectual simulation models / **Olga Isaeva** (*Institute of Computational Modelling SB RAS, Krasnoyarsk)*.

Discussion of the dissertation for the degree of Doctor of Technical Sciences

Round Table: **«Digital Twins of Objects in Critical Infrastructure»**

Keynote Speakers: **Aleksei Massel, Yurii Bulatov, Natalya Buyakova**

SESSION 3

1. Self-organizing algorithm for substantiation of safety properties of complex technical objects / **Olga Nikolaychuk**, Alexander Berman *(Matrosov Institute for System Dynamics and Control Theory (MISDCT) SB RAS, Irkutsk)*.

2. Ontology design patterns engineering for industrial safety inspection of critical facilities / Nikita Dorodnykh, Olga Nikolaychuk, **Aleksandr Yurin** *(MISDCT SB RAS)*.

3. The identification of unique mechanical systems state based on agent-based simulation modeling / Olga Nikolaychuk, Aleksandr Pavlov, **Aleksandr Stolbov** *(MISDCT SB RAS)*.

4. Implementing an integrated approach to searching critical elements of an energy system / Alexey Edelev *(MESI SB RAS)*, Sergey Gorsky, **Aleksandr Feoktistov** *(MISDCT SB RAS)*.

5. Application of reinforcement learning techniques for the construction of non-convex optimization algorithms / **Pavel Sorokovikov** *(MISDCT SB RAS)*.

6. Information infrastructure for supporting Baikal microbiome research / **Evgeny Cherkashin**, Alexey Shigarov *(MISDCT SB RAS)*, Vasilii Khristyuk *(INRTU)*.

7. Algorithms for identifying of contradictions in knowledge bases of the expert systems for managing critical infrastructures **/ Leonid Arshinskiy** *(ISTU)*, Vadim Arshinskiy, Mikhai Dunaev *(INRTU)*, Marina Nitezhuk *(ISTU)*.

8. On multiple coverings of fixed size containers with non-Euclidean metric by circles of two types / **Anna Lempert** *(MISDCT SB RAS)*.

9. Algorithms for search of best-of-known solutions for morse clusters / Alexander Gornov, Anton Anikin, Pavel Sorokovikov, **Tatiana Zarodnyuk** *(MISDCT SB RAS)*.

10. Numerical technique for solving highly sparse convex optimization problems / **Anton Anikin** *(MISDCT SB RAS)*.

11. Simulation of pollutants deposition based on transfer models, taking into account their applicability / **Maxim Zarodnyuk**, Alexey Massel, Vladimir Kuzmin *(MESI SB RAS)*.

12. Building and testing the distributed applied software packages / Natalia Beresneva, Sergey Vorobev, **Alexey Edelev** *(MESI SB RAS)*.

13. Artificial intelligence for the knowledge preservation and extraction / **Natalia Tuchkova** *(Dorodnicyn Computing Center of FRC CSC RAS, Moscow).*
14. Bibliographic reference as a tool of the author and reader / **Aleksei Ermakov** *(Keldysh Institute of Applied Mathematics RAS, Moscow).*

Round Table: **«Critical Infrastructures and Artificial Intelligence»**

Keynote Speakers: **Natalia Tuchkova, Olga Nikolaychuk, Aleksandr Yurin**

IN THE EVENING ALL PARTICIPANTS ARE INVITED TO THE FAREWELL DINNER

March 14, 10:00

SESSION 4

1. Modeling of rare flood on the example of middle rivers of Angara basin application for mitigation of damages / Ivanyo Yaroslav, Belyakova Anna, **Sofia Petrova** *(Ezhevsky Irkutsk State Agricultural University (EISAU), Irkutsk).*
2. Optimization of a combination of production of agrarian production and harvesting of wild food resources / **Margarita Barsukova**, Yaroslav Ivanyo, Sofia Petrova *(EISAU).*
3. Management models of agrarian production in the conditions of high risks / Yaroslav Ivanyo, **Nina Fedurina** *(EISAU).*
4. Management models of agricultural production with a criterion for minimizing environmental and technological impacts on the environment / Yaroslav Ivanyo, **Evgeniya Kovaleva** *(EISAU).*
5. Multi-criteria problem with uncertainty parameters for modeling production of food wild products / Marina Polkovskaya, **Tatiana Buzina**, Yaroslav Ivanyo *(EISAU).*
6. Knowledge base for modeling variability of climate events / Yaroslav Ivanyo, **Nadezhda Bendik**, Peter Asalkhanov *(EISAU).*

7. Making interdependent critical infrastructures resilient: network platform with matched actors / Alexei Tikhomirov *(INHA University, Republic of Korea)*, **Andrey Trufanov** *(INRTU)*, Olga Berestneva *(Tomsk Polytechnic University, Tomsk)*, Alessandra Rossodivita *(Ospedale Luigi Sacco, Italy)*, Nikolay Kinash *(INRTU)*.

8. Method of analysis interdependence of critical infrastructures objects and detection of critical facilities based on complex networks / Liudmila Massel *(MESI SB RAS)*, **Elena Nosyreva** *(INRTU)*.

9. Application of mathematical modeling in critical infrastructure "Public health" / **Vladimir Kuz'menko** *(ISMAPgE, Irkutsk)*, Aleksandr Gornov, Anton Anikin *(MISDCT SB RAS)*

FINAL DISCUSSION

CLOSING CEREMONY

March 15, 10:00

Departure of the participants to Irkutsk