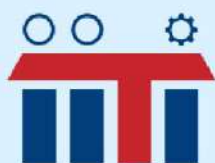




开元国际数学研究院
KAIYUAN INTERNATIONAL MATHEMATICAL RESEARCH INSTITUTE



JSC NIAS



THE 1ST KAIYUAN INTERNATIONAL FORUM ON APPLIED MATHEMATICS

THE 10TH INTERNATIONAL CONFERENCE ON INTELLIGENT INFORMATION TECHNOLOGIES FOR INDUSTRY (IITI)

PROGRAMME



10.15—17

CHANGSHA
CHINA



ORGANIZERS

Kaiyuan International Mathematical Sciences Institute (China)
Rostov State Transport University (Russia)
JSC "NIIAS" (Russia)
Russian Association for Artificial Intelligence (Russia)

Honored Chairs

- **Alexander Dolgiy**, JSC "NIIAS", Russia¹
- **Vladimir Vereskun**, Rostov State Transport University, Russia
- **Gao Xiaoshan**, Kaiyuan International Mathematical Sciences Institute, China

Conference Chairs

- **Igor Kotenko**, St. Petersburg Federal Research Center of RAS, and ITMO University, Russia
- **Sergey Grishaev**, JSC "NIIAS", Russia
- **Sergey Kovalev**, Rostov State Transport University, JSC "NIIAS", Russia
- **Zhu Jubo**, Kaiyuan International Mathematical Sciences Institute, China
- **Huang Yunqing**, Xiangtan University, China
- **Wu Boying**, Harbin Institute of Technology, China

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- **Andrey Sukhanov**, Rostov State Transport University, JSC "NIIAS", Russia
- **Ivan Olgeyzer**, Rostov State Transport University, JSC "NIIAS", Russia
- **Maria Butakova**, Rostov State Transport University, Russia
- **Zhou Bo**, Kaiyuan International Mathematical Sciences Institute, China

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- **Anna Kolodenkova**, Samara National Research University named after Academician S.P. Korolev (Samara University), Russia
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- **Larisa Vasileva**, JSC "NIIAS", Russia
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- **Li Yin**, Harbin Institute of Technology, China
- **Liu Sihan**, Kaiyuan International Mathematical Sciences Institute, China
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- **Aleksandr Panov**, Federal Research Center "Computer Science and Control" of the Russian Academy of Sciences, Moscow Institute of Physics and Technology, Artificial Intelligence Research Institute, Russia
- **Alexander Bozhenyuk**, Southern Federal University, Russia

¹ All names are listed in alphabetical order - honorary chairs, co-chairs of the Program and Organizing Committees, and members of the Organizing and Program Committees

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- **Li Dengfeng**, University of Electronic Science and Technology of China, China
- **Li Tao**, East China Normal University, China
- **Li Xiuxian**, Tongji University, China
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- **Mikhail Yurushkin**, Southern Federal University, Russia
- **Mikhail Zabezhailo**, Dorodnicyn Computing Centre of Russian Academy of Sciences, Russia
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- **Sergei Kucherov**, Southern Federal University, Russia
- **Sergey Dulin**, Research & Design Institute for Information Technology, Signalling and Telecommunications on Railway Transport, Russia
- **Sergey Kuznetsov**, Higher School of Economics, Russia
- **Sergey Makhortov**, Voronezh State Technical University, Russia
- **Sergey Petrenko**, Innopolis University, Russia
- **Sergey Rodzin**, Southern Federal University, Russia
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- **Vasily Desnitsky**, Saint-Petersburg Federal Research Center of Russian Academy of Sciences, Russia
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- **Vladimir Kureichik**, Southern Federal University, Russia
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- **Xu Genjiu**, Northwestern Polytechnical University, China
- **Xu Xuanhua**, Central South University, China
- **Yan Liang**, National University of Defense Technology, China
- **Yang Weihua**, Taiyuan University of Technology, China
- **Yuri Kravchenko**, Southern Federal University, Russia
- **Yuri Rogozov**, Southern Federal University, Russia
- **Zhang Shenggui**, Northwestern Polytechnical University, China
- **Zhang Ye**, Shenzhen MSU-BIT University, China
- **Zhao Chengli**, Kaiyuan International Mathematical Sciences Institute, China
- **Zhou Yue**, Kaiyuan International Mathematical Sciences Institute, China
- **Zhu Wei**, Chongqing University of Posts and Telecommunications, China

VENUE

CHANGSHA

**! The conference will be held at the participants' place of stay,
the Changsha Rongtong Great Wall Hotel**

Address No. 28 Shaoshan North Road, Jiucaiyuan Subdistrict,
Furong District, Changsha, Hunan, China (湖南省长沙市芙蓉区韭菜园 韶山路 28 号, [map](#))



Information about self-approaching the conference venue on its own:

From Airport:

- **By taxi or ride-hailing apps:** It is recommended to use DiDi or Amap (高德地图) app on cellphone, just enter the hotel name. Estimate cost: RMB 100 Yuan.
- **By metro:** Take Metro Line 6 and transfer to Metro Line 2 at Renmin East Road Station (人民路站) or Yingbin Road Station (迎宾路站), then get off at Yuanjialing Station (袁家岭站). Exit from Exit 1 of Yuanjialing Station or Exit 4 of Yingbin Road Station and walk for about 5–8 minutes to reach the hotel. Estimate cost: RMB 10 Yuan.
- **By Airport Express bus:** Take the Airport Express bus from Platform B2 at Terminal 1 or Platform A2 at Terminal 2 and choose the bus heading toward Shanshui Hotel (山水酒店). Get off at Gaogiao South Gate (高桥南门) or Jintai Square Station (锦泰广场站), then transfer to Metro Line 2 and alight at Yuanjialing Station (袁家岭站) (Exit 1) or Yingbin Road Station (迎宾路站) (Exit 4). From there, it is about a 5–8-minute walk to the hotel. Estimate cost: RMB 20 Yuan.

From Changsha South/Highspeed Railway Station to the hotel

- **By taxi or ride-hailing apps:** It is recommended to use DiDi or Amap (高德地图) app on cellphone, just enter the hotel name. Estimate cost: RMB 40 Yuan.
- **By metro:** At Changsha South Railway Station, take Metro Line 2 (toward Meixihu) and get off at Yuanjialing Station (袁家岭站). Exit from Exit 1. After exiting, it is about a 5–8-minute walk to the Hotel. Estimate cost: RMB 5 Yuan.



Changsha Rongtong Great Wall Hotel

October 15, 8:30 – 17:50
October 16, 9:00 – 17:20
October 17, 10:00 – 16:00

Official IITI'26 Dinner will be held at:

Rongtong Hall, Changsha Rongtong Great Wall Hotel

October 15, 18:00

IITI'26 Regulations

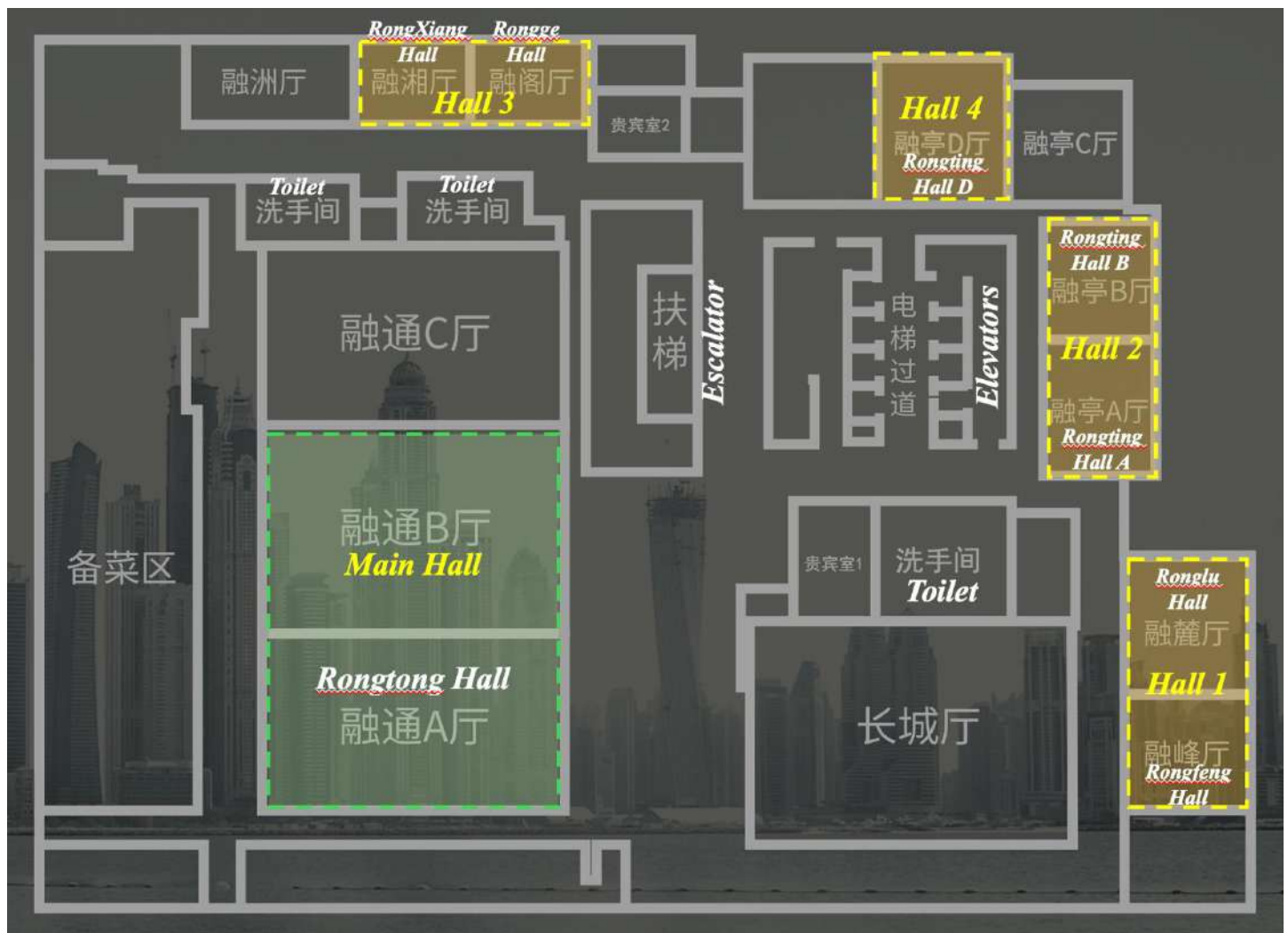
25-50 min – Keynote report¹

10 min – Session report²

Information for Online Participants

Links for joining the sessions are provided later in the programme

Information for In-Person Participants



Meeting hall layout of the conference center
(5th floor of **Changsha Rongtong Great Wall Hotel**)

¹ One hour is allotted for the plenary presentation, questions, and discussion

² 15 minutes are allotted for the session report, questions, and discussion

IITI'26 Programme

Wednesday, October 14 – Check-in at the hotel (from 10:00 am)

Thursday, October 15

Events:

- Opening ceremony 📍 Main Hall
- Plenary **IITI** reports 📍 Main Hall
- Conference Sessions:
 - Session 1 Decision Making Intelligent Systems (Part 1, 2) 📍 Hall 1
 - Session 2 Artificial Intelligence in Information Security, Quantum Computer Science 📍 Hall 2
 - Session 3 Artificial Neural Networks, Machine Learning and Their Applications
(Part 1, 2) 📍 Hall 3
 - Session 4 Artificial Intelligence in Industry 📍 Hall 4
 - Session 5 Fuzzy Models and Systems, Non-Classical Logic and Plausible Inference 📍 Hall 2
 - Session 6 Logical and Mathematical Foundations of Artificial Intelligence, Evolutional Modeling and Multiagent Systems 📍 Hall 4
- Official Dinner

8:00 – 8:30	Registration at Kaiyuan International Mathematical Sciences Institute
8:30 – 9:00	Welcome words 📍 Main Hall Ceremony Host: Professor Duan Xiaojun Link for online participants: https://meeting.tencent.com/dm/XKW7luflFm14 Room number on VooV/Tencent meeting: 178-457-341 1. Representative of Changsha Municipal Government (specific information to be confirmed), China 2. Sergey Kovalev, Chairman of IITI, Professor, JSC "NIIAS", Russia 3. Gao Xiaoshan, Professor, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Kaiyuan International Mathematical Sciences Institute, China 4. Sergey Grishaev, Chair of the Association "Union of Railway Equipment Manufacturers", Deputy General Director of JSC "NIIAS"– Director of the Rostov Branch, Russia
9:00 – 12:20	Plenary Talk 📍 Main Hall Plenary Session Chair: Professor Gao Xiaoshan Link for online participants: https://meeting.tencent.com/dm/XKW7luflFm14 Room number on VooV/Tencent meeting: 178-457-341
9:00 – 10:00	Guo Lei , Academician of the Chinese Academy of Sciences, Professor, Director, National Center for Mathematics and Interdisciplinary Sciences, Chinese Academy of Sciences, China. Learning and Adaptation in Uncertain Dynamic Systems
10:00 – 10:20	Coffee Break & Group Photo

10:20 – 11:20	Lev Utkin , D.Sc. (Tech.), Professor, Peter the Great St. Petersburg Polytechnic University, Russia Conditional treatment effect models under uncertainty in training data
11:20 – 12:20	Xu Zongben , Academician of the Chinese Academy of Sciences, Dean of the Xi'an Institute of Mathematics and Mathematical Technology, professor of Xi'an Jiaotong University A Limit Theory of Foundation Models: A Mathematical Approach to Understanding Emergent Intelligence and Scaling Laws
12:20 – 13:30	Lunch
13:30 – 17:50	IITI Sessions , 📍 Halls 1, 2, 3, 4
13:30 – 15:30	Session 1 Part 1 📍 Hall 1 Decision Making Intelligent Systems Session Chairs: Gennadiy Veselov, Li Yin Link for online participants: https://meeting.tencent.com/dm/V3AzkRLFHLxI Room number on VooV/Tencent meeting: 790-613-744 Gennadiy Veselov, Leonid Gladkov, Vladislav Danilchenko and Philip Bulyga. Distributed Multi-Agent Inspection Planning for Wind Farms Using Bio-Inspired Cooperative Optimization (in-person) Olga Kopaneva, Petr Kuderov and Aleksandr Panov. InvGym: An Extensible Reinforcement Learning Environment for Inventory Management (in-person) Gennadii Kruglov, Maxim Tikhomirov and Ivan Kulinich. Multi-Agent Neuro-Symbolic Synthesis of Provably Safe Design Decisions in Automotive Systems (in-person) Alexey Averkin, Yuri Trofimov, Mikhail Lebedev, Andrei Ilin, Elizaveta Kondrashova and Alex Lebedev. Concept-Latent Space Alignment in Fuzzy Attention Networks for Safety-Critical Intelligent Decision Support (in-person) Evgeniya Gerasimenko and Vladimir Kureichik. Safe Evacuation under Uncertainty: A Fuzzy Hybrid Decision-Making Model with Dynamic Contraflow (online) Alexander Smirnov, Andrew Ponomarev and Anton Agafonov. Large Language Models for Conceptual Modeling: Semantic and Component-Level Evaluation (online) Alexander Tselykh, Vladislav Vasilev and Larisa Tselykh. Intelligent Risk Assessment for Railway Systems: Integrating Optimal LQ-Control into FMEA (online) Alexander Dolgiy, Sergey Kovalev, Dmitrii Shvalov and Valerii Shvalov. Hybrid Method of Fault Identification in Technical Devices Based on Multiscale Data Analysis and Fuzzy Logic (online)

13:30 – 15:30	Session 2 📍 Hall 2 Artificial Intelligence in Information Security, Quantum Computer Science Session Chairs: Igor Kotenko, Duan Xiaojun Link for online participants: https://meeting.tencent.com/dm/cUOrJT6CIm4G Room number on VooV/Tencent meeting: 804-445-460 1. Konstantin Gnidko, Sofia Shiryayeva and Vlada Petrenko. Quantum-Inspired Edge Ranking for Spectral Control of Static Complex Networks (in-person) 2. Wang Ao, Zhou Zijian and Jin Renjie. Covert Leakage in Post-Quantum Cryptography: An Algorithm Substitution Attack on ML-KEM (in-person) 3. Andrey Chechulin. Metric-Based Evaluation of AI-Assisted Security Incident Timeline Reconstruction (in-person) 4. Nikita Mokrinskii, Pavel Sharikov and Andrey Chechulin. Modeling and Classification of Events and Processes in Information Systems (in-person) 5. Aspasia Oikonomou and Ilias Savvas. Assessing Readiness for Emerging Technologies: Greek Secondary Educators' Perspectives on AI and Quantum Literacy (in-person) 6. Igor Kotenko, Igor Saenko and Evgenii Mityakov. Detecting Cyber Attacks on Railway Infrastructure Using a Digital Twin (online) 7. Pavel Sundeev. Logical inference model for the structural-parametric synthesis of constructive protection (online) 8. Daniil Legkodymov, Dmitry Levshun and Igor Ushakov. Device-Profiled Intrusion Detection in IoT Networks: A Deep Learning Pipeline for Anomaly Detection and Attack Classification (in-person)
13:30 – 15:30	Session 3 Part 1 📍 Hall 3 Artificial Neural Networks, Machine Learning and Their Applications Session Chairs: Lev Utkin, Chen Bo Link for online participants: https://meeting.tencent.com/dm/LlrCEsLTTZLe Room number on VooV/Tencent meeting: 846-746-849 1. Lev Utkin, Natalya Verbova, Stanislav Kogan, Andrei Konstantinov and Vladimir Muliukha. Iterative Beran-Based Model and Entropic Optimal Transport for Survival Analysis (in-person) 2. Andrei Konstantinov, Lev Utkin, Natalya Verbova and Stanislav Kirpichenko. SurvRel: Incorporating Relationship Information into Survival Models (in-person) 3. Margarita Kichik and Dmitry Yudin. MatLVIS: Large-Scale Dataset for Object Material Recognition in Images (in-person) 4. Wang Zhaoyu, Ye Xiongfei and Zheng Yan. Tensor Decomposition and Comparative Evaluation of Multi-evidence Protein-Protein Interaction Networks (in-person) 5. Liu Yafen, Li Ang, Ding Ziheng, Chen Beier and Wang Hongxia. Domain-Adversarial Regularized Graph Neural Networks for Cross-Subject EEG-Based Driver Fatigue Detection (in-person) 6. Leonid Gladkov, Nikolay Posrednikov and Nadezhda Gladkova. A Method for Predicting Congestion During Physical Design Based on a Self-Supervised Pin-Aware Heterogeneous GNN (in-person) 7. Zhou Zixi, Xu Jie, Li Hao and Xie Zheng. ConvCNP-TS: A Meta-Bootstrapping Framework for Sampling Multiple Time Series (in-person)

	8. Qi Yang, Sun Quishi and Li Yin. Modeling the Impact of Tweets on Commodity Futures with Explainable AI (in-person)
13:30 – 15:30	Session 4 📍 Hall 4 Artificial Intelligence in Industry Session Chairs: Valeriya Gribova, Zhao Chengli Link for online participants: https://meeting.tencent.com/dm/nseUPDf1V2j6 Room number on VooV/Tencent meeting: 745-282-927 1. Valeriya Gribova, Mikhail Zenkov and Vadim Timchenko. An Approach to Automated Analysis and Aggregation of Knowledge in Laser Additive Manufacturing Metals (in-person) 2. Maxim Gorda, Klim Cherepanov and Andrey Chechulin. A Benchmark for Evaluating Artificial Intelligence Models in Decision-Support Tasks for the Legal Qualification of Information Security Incidents (in-person) 3. Hamidreza Sekandari, Viktoria Korzhuk, Andrei Petrovski and Igor Kotenko. Physics-Informed and AI-Enhanced Honeypot Framework for Industrial Control Systems (in-person) 4. Jia Yuanyuan, Liu Jiawei, Xiao Yike, Liu Zecong and Duan Xiaojun. An Adaptive Batch Selection Method for Parallel Multi-Fidelity Optimization (in-person) 5. Zhang Quanquan. Research on Dynamic Management and Control of Heterogeneous UAV Swarms for Airport Clearance Protection Based on Rainbow DQN (in-person) 6. Gleb Guskov, Alexandra Chekina, Alexander Shcherbina, Ramil Zaineev and Nadezhda Yarushkina. Time Series Forecasting Based on the Prophet-SARIMA-LSTM Ensemble (in-person) 7. Mikhail Alekseykov, Ekaterina Borchyk and Anatoly Yakimov. Sensitivity of Composite Metrics in the Problem of Cluster Diagnostics of Spinal Diseases (online) 8. Vladimir Shapovalov, Vladimir Khusainov and Elena Shepilova. Artificial Intelligence and Machine Learning Methods in Georadiolocation: Clustering of Signals and Construction of Media Boundaries (online)
15:30 – 15:50	Coffee Break
15:50 – 17:50	Session 1 Part 2 📍 Hall 1 Decision Making Intelligent Systems Session Chairs: Konstantin Gnidko, Li Yin Link for online participants: https://meeting.tencent.com/dm/V3AzkRLFHLxI Room number on VooV/Tencent meeting: 790-613-744 1. Konstantin Gnidko and Alla Bylinskaya. Zero-Shot Detection of Early Autism Risk Markers in Spontaneous Home Videos Using Vision-Language Models (in-person) 2. Han Xinyue. Balancing Implementation Feasibility and Return in Project Portfolio Optimization (in-person) 3. Oleg Kirovskii, Maria Zhurina, Alisa Stroeva and Anton Korolev. Artificial Intelligence-based Method and Algorithm for Evaluating the Exposure Parameter in Hazard Analysis and Risk Assessment of Highly Automated Vehicle (in-person) 4. Hu Xinyue, Huang Ping and Peng Qiyuan. Resilience Optimization of HSR Train Timetable: A Multi-Objective Deep Reinforcement Learning Method (online)

	5. Alexander Tselykh, Larisa Tselykh, Simon Barkovskii and Sergey Dikarev. A Decision Support System with Cognitive Architecture: Integrating Generative LLMs and Optimization Methods for Causal Modeling of Institutional Environments (online) 6. Anton Ryabtsev and Sergey Dulin. Online Incremental Grouping of Identical Objects under Expert Overrides (online) 7. Sergey Sokolov, Andrey Okhotnikov, Dmitry Shvalov and Irina Reshetnikova. High-Precision Iterative Estimation of Positioning Parameters for Unmanned Objects Using Digital Maps and Satellite Measurements (online) 8. Vladislav Danilchenko, Daria Zaruba, Nadezhda Gladkova and Philip Bulyga. Application of Ontological Research to Formalize Knowledge in the Process of VLSI Design (online) 9. Daria Zaruba, Elmar Kuliev, Vladimir Kureichik, Daniil Kravchenko and Yuri Kravchenko. Knowledge Retrieval Algorithm for Decision-Making Support in Emergency Situations Leveraging Blockchain Technology (online)
15:50 – 17:50	Session 5 📍 Hall 2 Fuzzy Models and Systems, Non-Classical Logic and Plausible Inference Session Chairs: Alexey Averkin, Yan Liang Link for online participants: https://meeting.tencent.com/dm/cfC7zCALxkf9 Room number on VooV/Tencent meeting: 844-451-730 1. Alexey Averkin, Yuri Trofimov, Alex Lebedev, Mikhail Lebedev, Andrei Ilin and Andrey Nechaevskiy. Routed Kolmogorov–Arnold Fuzzy Networks for Stable Interpretable Prediction (in-person) 2. Hao Yuliang, Guo Yu and Liu Yicheng. Modelling and Asymptotic Stability of the n-stage RLC Circuits with Feedback Delays (in-person) 3. Ye Juntian, Li Sijie, Li Zhifeng, Peng Xuanang and Luo Tingjin. UAV Path Planning Under Radar Interference in Mountainous Terrain (in-person) 4. Vadim Moshkin, Eugeny Mytarin, Ilya Andreev and Liyang Shao. Integration of the LSTM–Autoencoder Algorithm and Fuzzy Ontologies in Time Series Anomaly Detection Problems of Complex Technical Systems (in-person) 5. Alexander Bozhenyuk, Irina Dubchak and Olesiya Kosenko. Evaluation of Transport and Logistics System Parameters in Conditions of Fuzziness and Uncertainty (online) 6. Valiaryan Ivashenka and Nikita Zotov. Indexed Structural Search in Semantic Space for Non-Classical Inference (online) 7. Eugene Zybin, Vladislav Kosyanchuk, Aleksey Lipatov, Georgy Platoshin and Igor Shchetinin. Fuzzy-Logic-Based Attitude Control System for a Flying-Wing Unmanned Aerial Vehicle (online) 8. Aleksander Kuleshov, Anton Romanov and Aleksey Filippov. Quality Assessment in the Production of Radio-Electronic Equipment Based on Fuzzy Modeling (online)
15:50 – 17:50	Session 3 Part 2 📍 Hall 3 Artificial Neural Networks, Machine Learning and Their Applications Session Chairs: Dmitry Yudin, Liu Yicheng Link for online participants: https://meeting.tencent.com/dm/LlrCEsLTTZLe Room number on VooV/Tencent meeting: 846-746-849 1. Shi Zifan, Huangpeng Qizi and Qi Mingze. Predicting Swarmalator Trajectories Based on a Decomposition Linear Neural Network (in-person)

	2. Fan Xincheng and Chen Zhiyang. Depth Prior Regularized HashNeRF for Sparse View Training (in-person) 3. Stanislav Fedotov, Azat Sungatullin, Vladimir Muliukha and Alexey Lukashin. Music Detection in Low-Quality Call Audio Machine Learning Models Based on Embeddings Produced by Self-Supervised Models (in-person) 4. Bertrand Frederick Boui A Boya and Lyudmila Babenko. Dynamical Effects of various gradients on Hopfield neural network (online) 5. Anna Kolodenkova and Mikhail Bochkarev. Development of a New Video-Based Dataset for Intruder Recognition (online) 6. Nikita Mishin and Maria Butakova. A Signals Compact Representation Method for Solving Machine Learning and Classification Tasks (online) 7. Maria Mukonina, Valerii Shvalov and Vladimir Shapovalov. Factor Analysis in Machine Learning Tasks for Forecasting Hydrological Parameters of Mountain and Lowland Rivers (online) 8. Artem Bondarenko, Vladislav Yakunichev, Maria Butakova and Vladimir Vereskun. Evaluating the Effectiveness of Using Kolmogorov-Arnold Networks and Classical Machine Learning Models for Detecting Botnet Attacks (online)
15:50 – 17:20	Session 6 📍 Hall 4 Logical and Mathematical Foundations of Artificial Intelligence, Evolutional Modeling and Multiagent Systems Chairs: Leonid Gladkov, Zhao Chengli Link for online participants: https://meeting.tencent.com/dm/LnsogzH5k2cs Room number on VooV/Tencent meeting: 744-896-001 1. Ruochenxing Liao and Xiaohuan Jiang. Equivalence Determination of APN Functions Based on the I/R Algorithm (in-person) 2. Shi Xuejian and Liu Yicheng. Synchronization Analysis for Non-Fully Coupled Semiconductor Laser Arrays (in-person) 3. Maxim Sakharov and Thierry Lépine. Exploring the Optimization Landscape of the Cooke Triplet Lens with Memetic Algorithms (online) 4. Veniamin Kurokhtin and Alexander Buldaev. Method for the Approximate Solution of Constrained Optimal Control Problems in the Class of Discrete Control Approximations (online) 5. Alexander Bochkov. A Formal Language with Memory Mechanism for Knowledge Representation in Artificial Intelligence Systems (online) 6. Sergey Rodzin, Anna Chernova and Sergey Grishaev. A Multi-Population Algorithm for Optimizing Multidimensional Functions (online)
18:00	Official Dinner 📍 Rongtong Hall

Friday, October 16

Events:

- Plenary **IITI** reports 📍 Main Hall
- Conference Sessions:
 - **Session 7** Automation and Intellectualization of Industrial, Transport and Energy Systems (Part 1, 2) 📍 Hall 1
 - **Session 8** Intelligent Information Technologies for Social and Natural Science (Part 1, 2) 📍 Hall 2
 - **Session 3 (continued)** Artificial Neural Networks, Machine Learning and Their Applications (Part 3) 📍 Hall 3
 - **Session 9** Generative Artificial Intelligence 📍 Hall 4
 - **Session 10** Human-Oriented and Customizable Artificial Intelligence, Models of Cognitive Activity; Guided Adaptation of Artificial Intelligence in Industry 📍 Hall 4
 - **Session 11** Intelligent Medical Systems 📍 Hall 4
- **KY-Forum Sessions:**
 - Releasing the 'Kaiyuan' annual open mathematical problems 📍 Main Hall
 - Communication between the Changsha Municipal Government, the Railway Campus of Central South University, NIIAS and UIRE 📍 Changsha Maglev Station, Hall 4

9:00 – 9:40	Duan Xiaojun, Professor , Executive deputy dean of KIMSI Releasing the 'Kaiyuan' annual open mathematical problems 📍 Main Hall Link for online participants: https://meeting.tencent.com/dm/uUkUsAN3f70b Room number on VooV/Tencent meeting: 250-401-339
9:40 – 12:00	Plenary Talk 📍 Main Hall Plenary Session Chair: Professor Duan Xiaojun Link for online participants: https://meeting.tencent.com/dm/uUkUsAN3f70b Room number on VooV/Tencent meeting: 250-401-339
9:40 – 10:40	Illias Savvas , Professor, Dept. of Digital Systems, University of Thessaly, Greece Quantum without the equations: building quantum literacy in education
10:40 – 11:00	Coffee Break
11:00 – 12:00	Gao Xiaoshan , Professor, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Kaiyuan International Mathematical Sciences Institute, China MechMath Agent Team: An LLM Driven Agent for Mathematical Research
12:00 – 13:00	Lunch
13:00 – 17:20	IITI Sessions 📍 Halls 1, 2, 3, 4

13:00 – 15:00	Session 7 Part 1 📍 Hall 1 Automation and Intellectualization of Industrial, Transport and Energy Systems Session Chairs: Ivan Olgeyzer, Xie Zheng Link for online participants: https://meeting.tencent.com/dm/6sJdIFdrfdMx Room number on VooV/Tencent meeting: 691-331-935 1. Wang Chengchao, Zhang Xue, Li Huichun, Zu Zhenghu and Zhao Chengli. Research on Methods for Simulation and Intervention Assessment of Infectious Disease Transmission in Changsha Based on Public Transportation Network (in-person) 2. Alexander Dolgiy, Sergey Kovalev, Andrey Sukhanov and Yin Li. Railway Freight Technological Processes Analysis Based on Novel Fuzzy Subtractive Algorithm (ReMTS) (in-person) 3. Dmitriy Ilushin. A Method for Distributing Station Signaling Devices for Modular Interlocking Systems (online) 4. Andrey Ilinykh, Alexander Pikalov, Elena Yurkova, Vladimir Miloradovich and Maria Kultan. Machine Learning Application in Railway Track Maintenance (online) 5. Elena Gerken, Alexandr Yusupov, Alexandr Alexandrov, Andrey Udalov, Elvira Pandik, Artem Kovalev and Agop Khatlamadzhiyan. Domain-Adaptive Automatic Speech Recognition for Railway Radio Communications (online) 6. Alexandr Yusupov, Elena Gerken, Andrey Udalov, Alexandr Alexandrov, Yuri Gurov and Agop Khatlamadzhiyan. Architecture of an Agent-Based Speech Interaction System for Communication with Locomotive Drivers (online) 7. Andrey Chepiga, Vasilii Shapovalov and Andrey Chebotarev. Optimization of Permanent Magnet Synchronous Motor Control Using Maximum Torque Per Ampere Criterion for Robot Positioning Tasks (online) 8. Vladimir Zekhtser, Andrey Kostoglotov and Egor Leonov. Synthesis of a Quasi-Optimal Fuzzy Controller for UAV Angular Orientation under Conditions of Damping External Disturbances Based on the Use of Underactuated Model (online)
13:00 – 15:00	Session 8 Part 1 📍 Hall 2 Intelligent Information Technologies for Social and Natural Science Session Chairs: Andrey Chechulin, Zhou Yue Link for online participants: https://meeting.tencent.com/dm/kHtt6MkmjaUC Room number on VooV/Tencent meeting: 515-704-754 1. Yang Yating, Zhang Xue and Zhao Chengli. Bayesian Optimization-Driven Modeling of National Voting Position Evolution Based on Friedkin–Johnsen Dynamics (in-person) 2. Li Runan, Zhang Xue and Zhao Chengli. Dynamic Metagraph Spatio-Temporal Network for Joint Prediction of Complex Events (in-person) 3. Ilya Mikhaylov, Marina Fomina, Kirill Sidorov, Myo Hlaing Win and Zayar Aung. Data Mining Models and Methods Development to Solve the Complex Objects Classifying Problem Based on LSTM Autoencoders (online) 4. Kirill Voronkov, Olga Gavrilenko, Valerii Oliseenko and Tatiana Tulupyeva. Graph Neural Networks for Predicting Psychological Traits of Online Social Network Users (online)

	5. Sergei Pronichkin and Marina Krynzina. Multimodal Systemic Discourse Analysis in Scientific Social Networks Based on Hybrid Methods of Lexical and Statistical Sentiment Assessment Using Graph Embeddings (online) 6. Zafar Vazirov and Sergei Pronichkin. Multi-Agent Modeling of the Emergent Dynamics of the National Innovation System in the Context of Science Diplomacy (online) 7. Sergei Solodov, Alexey Bursikov and Sergei Pronichkin. Agent-Based Modeling of Collective Scientific and Technological Strategies of Developing Countries in the Context of Global Transformation (online) 8. Vladimir Ushakov and Sergey Makhortov. A Method for Adapting a Small Language Model to Russian-Language Function Calling in the Project Management Domain (online)
13:00 – 15:00	Session 3 Part 3 📍 Hall 3 Artificial Neural Networks, Machine Learning and Their Applications Session Chairs: Igor Kotenko, Li Yin Link for online participants: https://meeting.tencent.com/dm/Ze2wQeunZWFz Room number on VooV/Tencent meeting: 190-929-650 1. Wang Sijun, He Haiwen, Fei Mingfeng and Luo Tingjin. Physics-Informed Levenberg-Marquardt Regression for High-Precision Thickness Measurement of SiC Epitaxial Layers (in-person) 2. Wang Zechang, Zhou Xianchen and Wang Hongxia. HETV-DIP: An Efficient Denoising Method with Hadamard Transform (in-person) 3. Yang Yong. Identification of Backbone Structure Based on Event-Driven Synchronous Control (in-person) 4. Chen Zhiyang and Fan Xincheng. SIREN Based EEG Signal Reconstruction with Optimized Frequency Parameters (in-person) 5. Linkai Wang, Lina Zhao and Jinghan Dong. A UOT-Guided Cross-Attention Multimodal Fusion Method for Few-Shot Bearing Fault Diagnosis (in-person) 6. Abakar Kalet Mahamat, Artyom Vyatkin and Evgenia Veiber. Automated Dataset Generation Algorithm for Episodic Memory Evaluation in LLMs (in-person) 7. Mhd Wasim Raed, Asma Abubaker Bushaala, Ilham Huseyinov, Igor Kotenko and Elena Fedorchenko. Text-Based Emotion Recognition Using ML, DL, and Transformers with Explainability and Stability Analysis (online) 8. Vladislav Ryazantsev and Galina Dorokhina. Hybrid Neural Microservice for Safe Correction of Short User-Generated Texts in Russian (online)
13:00 – 14:00	Session 9 📍 Hall 4 Generative Artificial Intelligence Session Chairs: Anton Korolev, Yan Liang Link for online participants: https://meeting.tencent.com/dm/FNbExkqMj63q Room number on VooV/Tencent meeting: 540-724-757 1. Gennadii Kruglov, Anton Korolev and Alexander Luchkov. Software 3.0: Neuro-Symbolic Requirements Compilation (in-person) 2. Nikita Dorodnykh, Alexander Yurin, Kirill Tobola, Ivan Poddubniy and Aldar Armaev. Question Answering on Tabular Data Using Contrastive Learning (in-person) 3. Georgii Basiev, Danil Demidenko and Fedor Bushmelev. Hybrid Hierarchical Table Parsing with Vision-Language Models (in-person)

	4. Nikita Bogomazov, Dmitrii Mariushkin and Konstantin Khabarov. Context-Aware Vulnerability Triage: From Source Code to LLM Prompts via Static Analysis and RAG (in-person)
14:00 – 15:00	Session 10 📍 Hall 4 Human-Oriented and Customizable Artificial Intelligence, Models of Cognitive Activity; Guided Adaptation of Artificial Intelligence in Industry Session Chairs: Anton Korolev, Wang Hongxia Link for online participants: https://meeting.tencent.com/dm/SOEnAoaWKPUp Room number on VooV/Tencent meeting: 288-873-994 1. Du Yijie. Pre-Insight Dynamical Analysis of Mathematical Insight via CSD–Jump Dual Dimensions (in-person) 2. Alexander Sviridov, Yuri Rogozov, Sergei Kucherov, Artem Borisov, Alexander Zhukov and Yulia Lipko. A Method of Extracting an Object Representation from Natural Language Texts Based on the Integrity Property in Information System Synthesis Tasks (online) 3. Sergei Kucherov, Yuri Rogozov, Alexander Sviridov, Artem Borisov, Alexander Zhukov and Alexandr Belikov. Technology of Software System Synthesis Based on Processing Text Descriptions of Integrity Formation Processes (online) 4. Vera Ilicheva and Alexander Guda. Asymptotic Analysis of the Model of Interaction of Transport and Technological Processes of Related Industries in the Context of Intellectualization of Decision-Making and Management (online)
14:00 – 16:15	Communication between the Changsha Municipal Government, the Railway Campus of Central South University, NIIAS and UIRE Part 1 📍 Changsha Maglev Station Visit Changsha Maglev Station and Central South University
15:00 – 15:20	Coffee Break
15:20 – 17:20	Session 7 Part 2 📍 Hall 1 Automation and Intellectualization of Industrial, Transport and Energy Systems Session Chairs: Ivan Olgezyer, Chen Bo Link for online participants: https://meeting.tencent.com/dm/6sJdIFdrfdMx Room number on VooV/Tencent meeting: 691-331-935 1. Ivan Olgezyer. Concept of Construction of Highly Automated Train Dissolution Process Control Systems (in-person) 2. Irina Mezhenewa, Sergey Chatoyan and Alexey Lukashin. Multi-Resolution Topological Graphs Ensembles for Reliable Incident Classification in Cybersecurity (in-person) 3. Enver Mamaev, Asker Khashev and Dmitriy Sorokin. A Mathematical Model of a Digital Twin for Railway Transportation Management under Multi-Criteria Optimization and Uncertainty (online) 4. Dmitriy Sorokin, Enver Mamaev and Asker Khashev. Transport Corridor as a Multi-Agent System: Participants Formalizing Problems Interaction in the Transportation Process (online)

	5. Nikolay Lyabakh and Maksim Bakalov. Development of the Categorical Apparatus and Mechanisms for the Formation of Collective Intelligence in Transport and Logistics Systems (online) 6. Vyacheslav Zadorozhniy, Victor Bogachev and Taras Bogachev. Fuzzy Set Theory in Modeling Time Parameters in the Organization of Empty Wagons Supply to Stations (online) 7. Anatolii Medvedev, Ekaterina Rodimanova, Dmitriy Rakov, Sofiia Onopko and Sofya Rozenfeld. Resource-Efficient Uncertainty-Aware Object Detection in Railway Environments via Deep Sub-Ensembles (online) 8. Yuri Bulavin and Olesya Ignatieva. An Event-Driven Environment for Constrained Railway Dispatching (online)
15:20 – 17:20	Session 8 Part 2 📍 Hall 2 Intelligent Information Technologies for Social and Natural Science Session Chairs: Andrey Chechulin, Zhou Zijian Link for online participants: https://meeting.tencent.com/dm/kHtt6MkmjaUC Room number on VooV/Tencent meeting: 515-704-754 1. Li Zhixin, Jiang Jihang, Pu Juntao, Xiao Xingjie, Li Yin and Sun Qiushi. Modeling the Impact of Political Tweets on Stablecoin Liquidity Using Explainable AI (in-person) 2. Wu Ji, Liu Shulei and Chen Kehao. Development of AI for Science and Its Applications in Frontier Research (in-person) 3. Galina Rybina and Andrey Grigoryev. Situational Control and Information Security Monitoring of Processes of Intelligent Tutoring Based on Integrated Expert Systems (in-person) 4. Boris Savelyev, Elena Gayer, Sergei Pronichkin and Dmitry Deviatkyn. Systemic-Ontological Analysis of Communication Patterns of Actors in the National Innovation System in the Context of Sentiment-Identification of the Discourse of Scientific Social Networks (online) 5. Zafar Vazirov and Sergei Pronichkin. System-Dynamic Modeling of Resource Provision of the National Innovation System in the Context of Global Transformation (online) 6. Boris Savelyev, Marina Krynzhdina, Sergey Pronichkin and Dmitry Deviatkyn. Neural Network Identification of Deviant Discourse and Semiotic Analysis of Nonlinear Communications in Scientific Social Networks (online) 7. Sergei Pronichkin and Natalia Skoriukina. Neural Network Cognitive Triangulation of Meaning in Scientific Social Networks: a Pragmatic-Functional Approach to Discourse Analysis (online)
15:20 – 16:20	Session 11 📍 Hall 3 Intelligent Medical Systems Session Chairs: Valeriya Gribova, Liu Yicheng Link for online participants: https://meeting.tencent.com/dm/DWC5uM0Gh8o0 Room number on VooV/Tencent meeting: 444-284-357 1. Karina Shakhgeldyan, Nikita Kuksin, Igor Domzhalov, Regina Pak and Boris Geltser. Phenotyping of Risk Factors for In-Hospital Mortality in Patients with ST-Segment Elevation Myocardial Infarction (in-person) 2. Boris Geltser, Karina Shakhgeldyan, Andrey Vishnevskiy, Anastasia Nesova, Vyacheslav Ryabov and Rostislav Karpov. Effectiveness of Machine Learning Methods and Survival Analysis in Assessing Mortality Risk in Patients with Acute Coronary Syndrome at Various Observation Horizons (in-person)

	3. Anton Misnik, Vadim Borisov and Maryia Shalukhova. Digital Twin-Based Intelligent System for Orthopedic Rehabilitation (online) 4. Mhd Wasim Raed, Mustafa Mustafa, Ilham Huseyinov, Elena Fedorchenko and Ismael Warnants. Explainable Multimodal AI Framework for Early Detection and Clinical Monitoring of Alzheimer's Disease (online)
16:40 – 18:15	Communication between the Changsha Municipal Government, the Railway Campus of Central South University, NIIAS and UIRE Part 2 ● Hall 4 Roundtable Exchange among the Changsha Municipal Government, Central South University Railway Campus, NIIAS, UIRE and KIMSI



Changsha Maglev Station

The Changsha Maglev is China's first commercially operated medium-low-speed magnetic transport line, built using Chinese technology. The 18.55 km Changsha Maglev Express line connects Changsha South High-Speed Rail Station with Changsha Huanghua International Airport. There are three stations on the operational section: **Changsha South (Changshanan), Langli и Huanghua Airport.**

The system's key feature is the use of **medium-low-speed magnetic levitation**, which allows the train to move above the guideway using electromagnetic suspension, with virtually no contact with the rail. The trains are designed primarily for short inter-hub journeys and provide a convenient connection between high-speed rail and air transport.

Of particular interest is **Langli station**, located approximately halfway along the route. It serves as a stopover between major transport hubs and demonstrates that the Maglev in Changsha is used not only as an airport express train, but also as an element of the city's transport system.

Saturday, October 17

Events:

- Conference Sessions:
 - [Session \(UIRE\) 12¹](#). Robotization of Complex Technological Processes: Implementation Prospects 📍 Hall 1
- KY-Forum Session:
 - [Graph Theory and Combinatorics in the Era of AI](#). 📍 KIMSI
- Visit to KIMSI²

9:00 – 10:30	Conference Sessions 📍 Hall 1 Union of Industries of Railway Equipment (UIRE)
8:30 – 17:50	KY-Forum Session 📍 KIMSI
9:00 – 10:30	Session 12 📍 Hall 1 Robotization of Complex Technological Processes: Implementation Prospects Session Chair: Sergey Grishaev, Deputy Director General of JSC "NIIAS" – Director of the Rostov Branch Link for online participants: https://meeting.tencent.com/dm/UWIRzv93xUMP Room number on VooV/Tencent meeting: 733-933-833 1. Sergey Grishaev. Opening Session. Key Objectives of UIRE in Research and Development (online) 2. Alexander Baitov. Intelligent support for on-board diagnostic systems in railway rolling stock 3. Vladislav Milyutin. Robotic systems in railway engineering (in-person) 4. Andrey Reshetnikov. Quantum Intelligent Control in Technical Systems (in-person) 5. Ivan Olgezyer. Intelligent Rolling Stock Securing in the Digital Railway Station Project (in-person)
8:30 – 10:10	Graph Theory and Combinatorics in the Era of AI. Part 1 📍 KIMSI Session Chair: Zejun Huang 1. Weiyi Wang. Sharp bounds of bounded ratio for Lorentzian matrices (in-person) 2. Bo Ning. Localized and weighted versions of extremal problems (in-person)
10:30 – 10:45	Coffee Break

¹ All participants whose research interests are related to AI technologies in transport are invited to attend

² Pre-registration required

10:45 – 12:00	Sections 12 📍 Hall 1 Robotization of Complex Technological Processes: Implementation Prospects Session Chair: Sergey Grishaev Link for online participants: https://meeting.tencent.com/dm/UWIRzv93xUMP Room number on VooV/Tencent meeting: 733-933-833 1. Anna Bykova. Human–Machine Synergy: AI as a Tool for Modern Design (in-person) 2. Fedor Novikov. Localization of Pilot Production of Railway Automation Systems and Technology Transfer (in-person) 3. Mariia Zhukova, Vladislav Sokolov. Technologies for the Hump Yard Classification of Cars Carrying Dangerous Goods within the “Digital Railway Station” Project (in-person) 4. Agop Khatlamadzhiyan. Prospects for the Replication and Development of Digital Railway Station Modules (online) 5. Inna Gurgenidze. An Intelligent Model Based on Win-Win Control Principles for Train Traffic Schedule and Digital Railway Station Systems (online) 6. Pavel Mylnikov. Application of Neural Networks in Autonomous Train Operation (online)
10:30 – 12:30	Graph Theory and Combinatorics in the Era of AI. Part 2 📍 KIMSI Session Chair: Qingying Deng 1. Wei Jin. Two-geodesic-transitive graphs of odd order (in-person) 2. Pingshan Li. Extremal Structures in Graph Parameters: Dissociation Numbers and Their Characterizations (in-person)
12:00 – 14:00	Lunch
14:00 – 16:00	Sections 12 📍 Hall 1 Robotization of Complex Technological Processes: Implementation Prospects Session Chair: Sergey Grishaev Link for online participants: https://meeting.tencent.com/dm/CW23BC5ROrth Room number on VooV/Tencent meeting: 684-797-507 Presentations by Chinese colleagues
14:30 – 17:50	Graph Theory and Combinatorics in the Era of AI. Part 3 📍 KIMSI Session Chair: Chixuan Wu 1. Yanzhou Zhu. Coverings of groups and regular dessins (in-person) 2. Qingying Deng. Introducing a vertex polynomial invariant for embedded graphs (in-person) 3. Shikang Yu. Fractional clique decompositions of dense balanced multipartite graphs (in-person)
14:00 – 16:00	Visit to KIMSI 📍 KIMSI

Sunday, October 18 – Departure of participants

Brief Introduction of KIMSI



Kaiyuan International Mathematical Sciences Institute

Address: No. 5, Information Port, Malanshan Video Cultural and Creative Industry Park,
Kaifu District, Changsha City, Hunan Province, China

Homepage: <https://www.kimsi.cn/en>

The Kaiyuan International Mathematical Sciences Institute (KIMSI) is a state-supported R&D institution jointly established by the Changsha Municipal Government and several top universities in China. KIMSI closely aligns with the nation's strategic development framework. It consists of six research centers: Mathematics of Chip Design, Mathematics of Artificial Intelligence, Complex Systems, Mathematical Cryptography, Computational Mathematics, and Frontiers of Mathematics, and it aims to provide intellectual support for China to achieve global leadership in mathematical sciences and related technology.

Strategic Orientation: National Strategy-Driven Innovation

Guided by the nation's critical strategic imperatives, KIMSI integrates domestic and foreign elite mathematical resources to establish an innovation platform that deeply integrates basic mathematical research with industrial applications.

Development Path: A Tripartite Model for Breakthroughs

KIMSI focuses on mathematics and interdisciplinary fields, targeting core mathematical challenges derived from key research areas in technologies. By integrating platform establishment, identifying key mathematical problems and technological innovation, KIMSI promotes the paradigm innovation of application-driven mathematical research to solve hard mathematical problems derived from critical technologies.

Core Mechanism: Dual-Engine Synergy for Collaborative Innovation

KIMSI implements an innovative "Demand-Driven & Frontier Breakthrough" dual-drive mechanism. By fostering deep integration across industry, academia, and research sectors, KIMSI establishes a "Mathematicians & Domain Experts & Engineers" collaborative system and establishes a holistic ecosystem that orchestrates the entire pipeline: from need identification and mathematical formulation (" $1\sim 0$ "), through pioneering research (" $0\sim 1$ "), to industrial application (" $1\sim N$ ").

Vision: Forging a Global Hub with Chinese Innovation

KIMSI aims to establish a world-class research institution that facilitates industrial innovations, integrates global mathematics networks, and drives regional industrial advancement, pioneering a distinctive Chinese paradigm of mathematics-enabled multidisciplinary convergence.