ICTM integrated computer technologies in mechanical engineering - synergetic engineering

International Scientific and Technical Conference

INTEGRATED COMPUTER TECHNOLOGIES IN MECHANICAL ENGINEERING – SYNERGETIC ENGINEERING

Kharkiv, Ukraine
29-30 October 2020

Organized by:

National Aerospace University "Kharkiv Aviation Institute"
Grid Dynamics
Kharkiv Regional State Administration

Patronage:

Ministry of Education and Science of Ukraine

GENERAL SCHEDULE

October 29, 2020 (Thursday)

8:15	TESTING SESSION : https://meet.google.com/erk-jemm-mas		
8:30	REGISTRATION OPENS		
9:00	OPENINGS CONFERENCE		
9:15	PLENARY SESSION		
10:15	TECHNICAL BREAK		
	Session 1 – Mechanical Engineering	Session 2 – Software Engineering and IT	Session 3 – Project management and Proceedings
	https://meet.google.com/erk-jemm-mas	https://meet.google.com/kyo-xkoq-uoi	https://meet.google.com/zco-rveu-sbt
10:25	Topic 1 – Integrated Computer Technologies in Aerospace Engineering	Topic 3 – Artificial Intelligence, Smart Systems	Topic 5 – Project management
12:30	TECHNICAL BREAK		
12:45	Topic 2 – Information Technology in Design and Manufacturing of Engines	Topic 4 – Data and Knowledge Engineering	Proceedings
15:40		CONCLUSIONS	
17:00	IN BETWEEN CONCLUSIONS		

October 30, 2020 (Friday)

9:00	Topic 6 – Information Technology in Creation of Rocket Space Systems and Interdisciplinary Studies		
13:00	CLOSING PANEL DEBATES: LOOKING TO THE FUTURE		
13:10	CLOSING OF THE CONFERENCE		

ICTM-2020 COMMITTEES

STEERING COMMITTEE

Honorary Chair

Nechyporuk Mykola, Doctor of Technical Sciences, Professor (National Aerospace University "Kharkiv Aviation Institute", Kharkiv, Ukraine).

Executive Chair

Pavlikov Vladimir, Doctor of Technical Sciences, Senior Research Associate (National Aerospace University "Kharkiv Aviation Institute", Kharkiv, Ukraine).

PROGRAM COMMITTEE (IN ALPHABETICAL ORDER)

Bo An, Doctor of Philosophy, Associate Professor (Nanyang Technological University, Nanyang, Singapore);

Bodyanskiy Yevgeniy, Doctor of Technical Sciences, Professor (Kharkiv National University of Radio Electronics, Kharkiv, Ukraine);

Boguslayev Vyacheslav, Doctor of Technical Sciences, Professor (Joint Stock Company Motor Sich, Zaporizhzhia, Ukraine);

Bychkov Sergiy, Doctor of Technical Sciences, Professor (Antonov Company, Kyiv, Ukraine);

Danylov Valeriy, Doctor of Technical Sciences, Professor (National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine);

Degtyarev Alexander, Academician of the National Academy of Science of Ukraine, Doctor of Technical Sciences (Yuzhnoye State Design Office, Dnipro, Ukraine);

Dolmatov Anatolii, Doctor of Technical Sciences, Professor (National Aerospace University "Kharkiv Aviation Institute", Kharkiv, Ukraine);

Donets Oleksandr, Doctor of Philosophy (Antonov Company, Kyiv, Ukraine);

Dorosh Mariia, Doctor of Technical Sciences, Associate Professor (Chernihiv National University of Technology, Chernihiv, Ukraine);

Druzhinin Evgeniy, Doctor of Technical Sciences, Professor (National Aerospace University "Kharkiv Aviation Institute", Kharkiv, Ukraine);

Fedorovych Oleg, Doctor of Technical Sciences, Professor (National Aerospace University "Kharkiv Aviation Institute", Kharkiv, Ukraine);

Whitehead Charles K., Doctor of Sciences, Professor (Cornell University, Ithaca, NY, USA);
Yakovlev Sergey, Doctor of Physics and Mathematics, Professor (National Aerospace University "Kharkiv Aviation Institute", Kharkiv, Ukraine);
Yudelson Michael V., Doctor of Philosophy (Carnegie Mellon University, Pittsburgh, PA, USA);
Zaslavskyi Volodymyr, Doctor of Technical Sciences, Professor (Taras Shevchenko National University of Kyiv, Kyiv, Ukraine);
Zavgorodniy Andrew, Doctor of Philosophy (LinkedIn, Milpitas, CA, USA).

ORGANIZING TEAM (National Aerospace University "Kharkiv Aviation Institute", Kharkiv, Ukraine)

Publication Chair: Kritskiy Dmitriy, *Secretary:* Starovoit Tetiana.

Members (in alphabetical order): Bykov Andrii, Hryhorenko Tetiana, Kalashnikova Vasylysa, Karatanov Oleksandr, Krytska Olha, Morikova Anastasia, Pohudina Olha, Shypul Olga, Tsegelnyk Yevgen.

The official language of the ICTM-2020 is English

Time for presentations:

Presentation at the plenary session is 25 minutes.
Paper presentation at the regular session is 10 minutes.
Proceedings overview at the regular session is 7 minutes.
Questions and Discussion is 5 minutes.

October, 29, 2020, Thursday

8:15	TESTING SESSION : https://meet.google.com/erk-jemm-mas
8:30	REGISTRATION OPENS
9:00	OPENINGS CONFERENCE *Vladimir Pavlikov* – Executive Chair of Conference National Aerospace University "KhAI", Ukraine
9:15	PLENARY SESSION Robert Głębocki – Keynote Speaker 1 Warsaw University of Technology, Poland Tibor Szalay – Keynote Speaker 2 Budapest University of Technology and Economics, Hungary
10:15	TECHNICAL BREAK
10:25	SESSION 1 – MECHANICAL ENGINEERING https://meet.google.com/erk-jemm-mas Olga Shypul – Chairman National Aerospace University "KhAI", Ukraine
Topic 1 – Integrated Computer Technologies in Aerospace Engineering	
10:30	*Eugeniy Trushliakov, Mykola Radchenko, Bohdan Portnoi, Veniamin Tkachenko and Serhiy Forduy* **Analysis of Operation of Ambient Air Conditioning Systems with Refrigeration Machines of Different Types**
10:45	*Denis Sliusar, Oleksii Isakov, Volodymyr Kolesnyk, Oleg Chugai, Leonid Litovchenko and Mikola Stepanushkin* **Computer Simulation Of Abnormal Glow Discharge In An Inverse Magnetron Sputtering System With Axial Plasma Flows**
11:00	*Mariya Shapovalova and Oleksii Vodka* **A Data-Driven Approach to The Prediction of Spheroidal Graphite Cast Iron Yield Surface Probability Characteristics**
11:15	*Sergiy Plankovskyy, Olga Shypul, Yevgen Tsegelnyk, Alexander Pankratov and Tatiana Romanova* **Amplification of Heat Transfer by Shock Waves for Thermal Energy Method**
11:30	*Dmytro Konyshev, Andriy Humennyi and Anton Chumak* **Transport aircrafts rear cargo door ramp with sealed floor main parameters and components**

	description and determination
11:45	*Valeriy Sikulskiy, Stanislav Sikulskyi and Vadym Garin* **Investigation Into The Forming Process Of Wing Panel Oblique Bending By Means Of Rib Rolling**
12:00	*Pavlo Gontarovskyi, Natalia Smetankina, Nataliia Garmash and Iryna Melezhyk* **Improvement of Computational Methods for Estimating the Stress-Strain State of Fuel Tanks of Launch Vehicles in 3D Formulation**
12:15	*Vladyslav Lutsenko, Irina Lutsenko, Ihor Popov, Aleksandr Soboliak, Nguyen Xuan Anh and Mikhail Babakov* **Active-Passive Radar Systems Using Radiation Of HF Band Broadcasting Stations For Airborne Objects Detection**
12:30	*Valeriy Mygal, Galyna Mygal and Igor Klymenko* **3D-modeling of the dynamics of real processes of different nature**
12:45	*Yuliia Viazovychenko and Oleksiy Larin* **Stochastic optimization algorithms for data processing in experimental self-heating process**
13:00	TECHNICAL BREAK
Topic 2 – Information Technology in Design and Manufacturing of Engines	
13:30	*Dmitry Ivchenko, Natalia Smetankina* **The Validation of the Bird-Impactor Model for Mathematical Modelling of Damage Processes in Turbofan Engine Parts**
13:45	*Andriy Marchenko, Vyacheslav Pylyov and Oleh Linkov* **Estimation of Strength of the Combustion Chamber of the ICE Piston with a TBC Layer**
14:00	*Andrii Rusanov, Oleg Khorev, Yevgen Agibalov, Yurii Bykov and Pavlo Korotaiev* **Numerical and experimental research of radial-axial pump-turbine models with spliters in turbine mode**
14:45	*Sergii Yevsieiev, Dmitry Kozel and Igor Kravchenko* **Increasing Accuracy Of The Gas Temperatures Pattern Calculation For Gte Combustor Using CFD**
15:00	*Gennadii Martynenko and Volodymyr Martynenko* **Identification of Computational Models of the Dynamics of Gas Turbine Unit Rotors with Magnetic Bearings by Incomplete Data for Design Automation**
15:15	*Kseniia Potopalska, Oleksiy Larin, Evgen Grinchenko and Andrii Kelin* **Numerical estimation of the residual life-time of the elements of the centrifugal pump of the energy station due to corrosion wear**
15:30	*Lyudmyla Rozova and Gennadii Martynenko* **The Design of Elements of Systems with Gas-Turbine Engines Based on Information Technology**
15:45	*Andrii Radchenko, Andrii Andreev, Dmytro Konovalov, Zhang Qiang and Luo Zewei* **Analysis of Ship Main Engine Intake Air Cooling by Ejector and Turbocompressor Chillers on Equatorial Voyages**
16:00	*Mykola Radchenko, Dariusz Mikielewicz, Andrii Andreev, Serhiy Vanyeyev and Chen Ning* **Efficient Ship Engine Cyclic Air Cooling by**

	Turboexpander Chiller for Tropical Climatic Conditions
16:15	*Svitlana Matus, Bohdan Sydorchuk and Oleksandr Naumchuk* **Modelling of Condenser Circuit of the Geothermal Heat Pump**
16:30	*Halina Kobalava, Dmytro Konovalov, Roman Radchenko, Serhiy Forduy and Vitaliy Maksymov* **Numerical Simulation of an Aerothermopressor with Incomplete Evaporation for Intercooling of the Gas Turbine Engine**
16:45	*Roman Radchenko, Maxim Pyrysunko, Victoria Kornienko, Ionut-Cristian Scurtu and Radosław Patyk* **Improving the Ecological and Energy Efficiency of Internal Combustion Engines by Ejector Chiller Using Recirculation Gas Heat**
17:00	IN BETWEEN CONCLUSION
10:25	SESSION 2 – SOFTWARE ENGINEERING AND IT https://meet.google.com/kyo-xkoq-uoi Tetiana Khyzhniak – Chairman National Aerospace University "KhAI", Ukraine
Topic 3 – Artificial Intelligence, Smart Systems	
10:30	*Nina Bakumenko, Viktoriia Strilets, Ievgen Meniailov, Serhii Chernysh, Mykhaylo Ugryumov and Tamara Goncharova* **Synthesis method of robust neural network models of systems and processes**
10:45	*Fangfang Li, Sergey Krivenko and Vladimir Lukin* **A fast method for visual quality prediction and providing in image lossy compression by SPIHT**
11:00	*Viacheslav Oliinyk, Vladimir Lukin and Igor Djurović* **A fast and efficient method for time delay estimation for wideband signals in non-Gaussian environment**
11:15	*Viktor Makarichev, Vladimir Lukin and Iryna Brysina* **On the Applications of the Special Class of Atomic Functions: Practical Aspects and Perspectives**
11:30	*Oleksandr Prokhorov, Yurii Pronchakov and Valeriy Prokhorov* **Cloud IoT Platform for Creating Intelligent Industrial Automation Systems**
11:45	*Nataliia Kobrina, Andrey Makoveckiy and Dmitriy Makarenko* **Improving vehicle safety through the use of Arduino controller-based automotive voice informants**
12:00	*Oleksandr Zabolotnyi, Vitalii Zabolotnyi and Nikolay Koshevoy* **Oil Products Moisture Measurement Using Adaptive Capacitive Instrument Measuring Transducers**
12:15	*Oleksandr Zabolotnyi and Maksym Sukhobrus* **Sorption-capacitive Gas Humidity Sensor of Increased Sensitivity**
12:30	*Nikolay Koshevoy, Oleg Burlieiev, Oleksandr Zabolotnyi, Olena Kostenko, Irina Koshevaya and Oleksii Potylchak* **Photoelectric measurement and**

	control methods of angular displacement of the aircraft control surfaces
12:45	*Olena Tachinina, Oleksandr Lysenko, Iryna Alekseeva and Valeriy Novikov* **Method for Designing Low-Orbit Clusters of Small Satellites Under Stochastic Disturbances**
13:00	TECHNICAL BREAK
Topic 4 – Data and Knowledge Engineering	
13:30	*Oleksii Reva, Andrii Nevynitsyn, Sergii Borsuk and Valerii Shulgin* **Technology of Integrated Application of Classical Decision Making Criteria for Risk-Uncertainty Assessment of Group Systems of Preferences of Air Traffic Controllers on Error's Dangers**
13:45	*Oksana Luchsheva, Ihor Turkin, Ihor Klymenko and Vitaliy Narozhnyy* **Smartphone for Smart Physics Learning: Find Out Where the Accelerometer is Located in Smartphone**
14:00	*Andrew Hrimov, Ievgen Meniailov, Dmytro Chumachenko, Ksenia Bazilevich and Tetyana Chumachenko* **Classification of Diabetes Disease using Logistic Regression Method**
14:45	*Mikle Tsuranov, Vladimir Pevnev, Heorhii Zemlianko and Olena Amelina* **Conceptual Model of Information Security**
15:00	*Yuliia Kuznetsova, Artem Kolomytsev, Maksym Somochkin and Oleksandr Vdovitchenko* **Serverless and Containerization Models and Methods in Challenger Banks Software**
15:15	*Sergiy Markovych, Andrey Chukhray, Vladislav Lukashov, Olena Havrylenko and Olena Novytska* **A Graphical Environment for Algorithms Training**
15:30	CONCLUSION
10:25	SESSION 3 – PROJECT MANAGEMENT AND PROCEEDINGS https://meet.google.com/zco-rveu-sbt Tetiana Starovoit – Chairman National Aerospace University "KhAI", Ukraine
Topic 5 – Project management	
10:30	*Olha Pohudina, Anastasiia Morikova, Evgeniy Druzhinin, Bohdan Haidabrus and Sergey Kiyko* **Comparison of metoheuristic search methods for the task of choosing a rational set of measures to risks` respond**
10:45	*Olena Zhykhor, Valeriy Ryeznikov, Olena Iafinovych, Nataliia Pohribna and Nataliia Miedviedkova.* **Project Management In Universities Under The Global Pandemic: A Focus On Finance**
11:00	*Nataliia Dotsenko, Dmytro Chumachenko, Igor Chumachenko, Yuliia Husieva, Dmytro Lysenko, Iryna Kadykova and Nataliia Kosenko* **Human**

	resource management tools in a multiproject environment
11:15	*Volodymyr Sokol, Mariia Bilova and Artem Kharin* **An Approach for Creating Learning Content from Knowledge Management System**
11:30	*Valentina Moskalenko and Nataliia Fonta* **The Cascading Subsystem of Key Performance Indicators in the Enterprise Performance Management System**
11:45	*Nina Padalko, Halyna Padalko and Anatoliy Padalko* **On Using Information and Communication Technologies in Process of Mathematical Specialties Education**
12:00	*Svitlana Gutsu, Maryna Mkrtchyan and Anastasiia Strielkina* ***Social*** **and Legal Aspects of the Transition to Industry 4.0**
12:15	TECHNICAL BREAK
13:00	PROCEEDINGS https://meet.google.com/zco-rveu-sbt Tetiana Starovoit – Chairman National Aerospace University "KhAI", Ukraine
13:10	*Viacheskav Kulichenko, Yevgen Sokol, Pavel Shchapov, Roman Tomashevskyi, Alexandr Gorbulitch and Oleksii Muzhychuk* **Improving the reliability of cardiological diagnostics of arrhythmias using stochastic parameters of spectral dynamics of rhythmograms**
13:20	*Yuliia Kuznetsova and Anatolii Levchenko* **The study of special features of high load systems software**
13:30	*Denis Polozhyi and Aleksandr Orekhov* **Application architectures: analyzing cloud-compatibility and scalability**
13:40	*Arkadii Zhukevych, Oleksandr Zhukevych and Denys Zubko* **Comprehensive control of the passenger lift performance by applying artificial intelligence**
13:50	*Oleg Chugay, Oleksiy Poluboyarov, Sergiy Olyynik, Oleksiy Voloshin, Roman Zaitsev and Mikhailo Kirichenko* **Macroscopic heterogeneity of optical, dielectric and photodielectric characteristics of ZnSe crystals**
14:00	*Sergey Kiyko* **Setting up the processes of project portfolio management in power optimization at Iron and Steel Enterprise**
14:10	*Dmytro Onyshchenko* **Viability of implementing and using serverless computing**
14:20	*Vadym Klochko* **Multicomponent analysis of images**
14:30	*Mykola Skrytskyi* **Geometry Optimization Of Gas Turbine Engine Blade Model**
14:40	*Borys Zaitsev, Natalia Smetankina, Tetiana Protasova, Ihor Larionov, Dmytro Klymenko and Dmytro Akimov* **Computational Assessment of How Dampers in a Pyrotechnical System for Rocket Fairing Separation Affect**

	its Dynamic Characteristics
14:50	*Katerina Mayorova and Viktoria Serebryannikova* **The state and problems of domestic business on the market of air freight in contemporary unstable conditions**
15:00	*Olexandr Los, Viktor Riabkov, Liudmyla Kapitanova and Ruslan Tsukanov* **Formation Method for Transport Category Airplane Modification Main Parameters by Their Adduced Values**
15:10	*Arkadii Zhukevych* **Using ARDUINO platforms at preparing electrical and mechanical engineers**
15:20	*Oleksandra Luchsheva* **Ways and methods of identification and cooperation with users**
15:30	*Anna Karpik and Yuri Vorobiev* **Forced vibrations of gas turbine engine compressor blade under the action of non-stationary gas dynamic force**
15:40	CONCLUSION

October, 30, 2020, Friday

8:50	SESSION 1 – MECHANICAL ENGINEERING https://meet.google.com/erk-jemm-mas Olga Shypul – Chairman National Aerospace University "KhAI", Ukraine
Topic 6 – Information Technology in Creation of Rocket Space Systems and Interdisciplinary Studies	
9:00	*Andrii Kondratiev, Sergiy Melnikov, Tetyana Nabokina and Anton Tsaritsynskyy* **Effect of Parameters of Adhesive Application by Intaglio Printing on Honeycomb Core Bonding Strength**
9:15	*Sergey Ugrimov, Natalia Smetankina, Oleh Kravchenko and Vladimir Yareshchenko* **Analysis of Laminated Composites Subjected to Impact**
9:30	*Sergiy Plankovskyy, Olga Shypul, Sergiy Zaklinskyy, Yevgen Tsegelnyk and Volodymyr Kombarov* **A Method of Rapid Measurement of Vessels Volume with Complex Shape by Critical Nozzles**
9:45	*Serhii Misura, Natalia Smetankina and Ievgeniia Misiura* **Rational Design of the Cyclically Symmetrical Structure**
10:00	*Natalia Smetankina, Alyona Merkulova, Dmytro Merkulov and Oleksii Postnyi* **Dynamic Response of Laminate Composite Shells with Complex Shape under Low-Velocity Impact**
10:15	*Mykhaylo Tkach, Yuri Zolotoy, Yurii Halynkin, Arkadii Proskurin, Irina Zhuk, Volodymyr Kluchnyk and Igor Bobylev* **Improving the noise immunity of the measuring and computing coherent-optical vibrodiagnostic complex**

10:30	*Maksym Nesterenko and Andrii Kondratiev* **Determination of the Acoustic Strength of Solar Battery Panel for Space Applications**
10:45	*Victoria Kornienko, Roman Radchenko, Łukash Bohdal, Leon Kukiełka and Stanisław Legutko* **Investigation of Condensing Heating Surfaces with Reduced Corrosion of Boilers with Water-Fuel Emulsion Combustion**
11:00	*Kostiantyn Barakhov, Daria Dvoretska and Oleksandr Poliakov* **One-dimensional axisymmetric model of the stress state of the adhesive joint**
11:15	*Oleksandr Cherednichenko, Mykhaylo Tkach and Vira Mitienkova* **Improving of Energy Efficiency of Cruise Ships by applying of Thermochemical Recuperation**
11:30	*Sergiy Plankovskyy, Viktoriia Breus, Oleksandr Karatanov, Olha Chubukina and Vitalii Voronko* **Review of Methods for Obtaining Hardening Coatings**
11:45	*Sergey Kurennov and Natalia Smetankina* **Stressed state of an infinite plate with a circular opening and a concentric cover plate**
12:00	*Oleh Pihnastyi and Georgii Kozhevnikov* **Kelvin-Voigt model of dynamic stress in the conveyor belt**
12:15	*Oleh Pihnastyi and Georgii Kozhevnikov* **Effective conveyor belt control based on the Time-Of-Use tariffs**
12:30	*Gennadiy Kostyuk, Iryna Kantemyr and Hanna Snitsar* **Methods for Producing Nanostructures and Performance of Zirconium Alloys**
12:45	*Sergey Kurennov, Konstantin Barakhov, Dariya Dvoretskaya and Alexander Poliakov* **Stress State of Two Glued Coaxial Tubes Under Nonuniform Axial Load**
13:15	CLOSING PANEL DEBATES: LOOKING TO THE FUTURE
13:30	CLOSING OF THE CONFERENCE *Vladimir Pavlikov* – Executive Chair of Conference **National Aerospace University "KhAI", Ukraine**