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Engineering Academy of Ukraine  
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US Army Research Laboratory, USA  
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Institute for safety problems of nuclear power plants of the NASU  
Chernihiv Polytechnic National University, Ukraine

## XV INTERNATIONAL SCIENTIFIC-PRACTICAL CONFERENCE

### MATHEMATICAL MODELING AND SIMULATION OF SYSTEMS MODS`2021

*June 28 – July 1, 2021*

Conference Programme



Chernihiv 2021

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## Part I MODS2021 Conference Schedule

Monday, June 28, 2021

Video conference access:

<https://us02web.zoom.us/j/82740575485?pwd=cFN2VWIMQ25jN1VKYXNndk9qdzFvQT09>

Meeting ID: 827 4057 5485 Password: C962yD

Time	Activity
<b>10:00 – 11:00</b>	<p><b>Plenary session.</b></p> <p>Opening Ceremony.</p> <p>Greetings of Professor Viktoriia Margasova, Vice-rector for Scientific Work of Chernihiv Polytechnic National University</p> <p>Keynote speech: <b>Cybersecurity user requirements analysis: the ECHO approach</b>            Speaker: Nikolai Stoianov, Associate Professor, Deputy Director of the Bulgarian Defense Institute (Bulgaria), Editor Board Member</p> <p>Keynote speech: <b>Modeling and Simulation for Cyber Physical Systems: Multi-Paradigm Approach</b>            Speaker: Volodymyr Kazymyr, Professor, Chernihiv Polytechnic National University (Ukraine), Editor Board Member</p>
11:00-13:00	<p style="text-align: center;"><b>Section 1</b></p> <p style="text-align: center;"><b>“Mathematical modeling and simulation of systems in ecology and geographic information systems”</b></p> <p>Session Chair: <b>Roman Bezhenar</b></p> <p>Tetyana Honcharenko, Oleksandr Terentyev and Ievgenii Gorbatyuk. <b>Mathematical Modeling of Information System Designing Master Plan of the Building Territory Based on OLAP Technology</b></p> <p>Vladimir Maderich, Igor Brovchenko and Kateryna Kovalets. <b>Transport of Reactive Tracer in Compacting Multi-fraction Bottom Sediments</b></p> <p>Bernd Kratz, Florian Wieduwilt and Maxim Saveliev. <b>Pillars for establishing a durable and future-proof IT architecture maturing along with the NSC: Approaches from Continuous Integration to Service Mesh</b></p> <p>Volodymyr Petrivskyi, Viktor Shevchenko, Oleksii Bychkov and Oleksii Pokotylo. <b>Models and information technologies of coverage of the territory by sensors with energy consumption optimization</b></p> <p>Sergey Lyashko, Dmitriy Klyushin and Andrii Tymoshenko. <b>Optimal Control of Buried Point Sources in a Two-Dimensional Richards-Klute Equation</b></p>

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Time	Activity
13:00-14:00	Lunch break

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14:00 -17:00

**Section 2****“Mathematical modeling and simulation of systems in manufacturing”**Session Chair: **Volodymyr Bazylevych**Andrii Kondratiev, Oleksandr Haidachuk, Anton Tsaritsynskyi and Tetyana Nabokina. **Modeling of Molding of Composite Products on Prepreg Basis**Anatoliy Kulik, Sergey Pasichnik and Dmytro Sokol. **Investigation of stationary processes in vortex energy separator through its computational fluid dynamics model**Serhii Morhun. **Numerical Analysis of the Gas turbine Rotor Blades Thermal State Using a Refined Mathematical Model**Kyrylo S. Krasnikov. **Mathematical modeling of heat field in a six-strand tundish during filling**Alexander Zaslavsky and Oleh Karpenko. **Prognostic model of a photovoltaic power plant**Svitlana Popereshnyak and Anastasiya Vecherkovskaya. **Research and Mathematical Modeling of Filter Elements Production Processes**Volodymyr Chupryna. **Modeling of Technological Machines Spatial Rigidity by Subsystems**Larysa Khalanchuk and Serhii Choporov. **Elliptical methods for surface meshing**

Tuesday, June 29, 2021

Video conference access:

<https://us02web.zoom.us/j/82740575485?pwd=cFN2VWIMQ25jN1VKYXNndk9qdzFvQT09>

Meeting ID: 827 4057 5485 Password: C962yD

Time	Activity
10:00-13:00	<p style="text-align: center;"><b>Section 3 (Part 1)</b></p> <p style="text-align: center;"><b>“Modern Aspects of Mathematical Modeling and Simulation of Systems in Information Technology and Cybersecurity”</b></p> <p>Session Chair: <b>Dmytro Rahozin</b></p> <p>Sergei Zaitsev, Vladyslav Vasylenko, Yuliia Tkach, Svetlana Lytvyn and Yurii Posternak. <b>Adaptive selection of turbo code parameters in wireless data transmission systems</b></p> <p>Dmytro Rahozin and Anatoliy Doroshenko. <b>Performance Model for Convolutional Neural Networks</b></p> <p>Dmytro Lande and Oleh Dmytrenko. <b>Research of Topological Properties of Network Reflections Obtained Using Different Algorithms for Scanning Initial Networks</b></p> <p>Oleksandr Khoshaba, Viktor Grechaninov, Anatoliy Lopushanskyi and Kostiantyn Zaverailo. <b>Studying the Dynamic Bottlenecks of a Load Balancer in Distributed Systems</b></p> <p>Ivan Burmaka, Mariia Dorosh, Igor Skiter and Svitlana Lytvyn. <b>Architecture of Distributed Blockchain Based Intrusion Detecting System for SOHO Networks</b></p> <p>Ihor Karpachev and Volodymyr Kazymyr. <b>Dynamic malware detection based on embedded models of execution signature chain</b></p> <p>Roman Andrushchenko and Andrii Rohovenko. <b>Method of adaptive error control coding of structured messages using parameterization of Reed-Solomon codes</b></p> <p>Mariya Verovko, John N. Davies, Oleksandr Verovko and Iryna Solomakha. <b>Usage of WBAN Systems and IoT solutions in a Medical Environment</b></p> <p>V.V. Shevchenko, D.S. Berestov, I.P. Sinitsyn and M.G. Brazhenenko <b>Modeling the educational environment of students as a model for the dissemination of information in society</b></p>
13:00 -14:00	Lunch break

Time	Activity
14:00-17:00	<p style="text-align: center;"><b>Section 3 (Part 2)</b></p> <p style="text-align: center;"><b>“Modern Aspects of Mathematical Modeling and Simulation of Systems in Information Technology and Cybersecurity</b></p> <p>Session Chair: <b>Maksym Saveliev</b></p> <p>Valentin Nekhai, Elena Trunova, Iryna Bilous, Iryna Bohdan and Mariia Voitsekhovska. <b>Cybersecurity Management Multi-Agent Model of The Agricultural Enterprise Management System Based on The CSA Concept</b></p> <p>Vasilis Katos, Duncan Ki-Aries, Shamal Faily, Angel Genchev, Maya Bozhilova and Nikolai Stoianov. <b>Cybersecurity user requirements analysis: the ECHO approach</b></p> <p>Andrii Yarmilko, Inna Rozlomii and Hryhoriy Kosenyuk. <b>Hash method for information stream’s safety in dynamic cooperative production system</b></p> <p>Iulia Khlevna and Dmytro Zhovtukhin. <b>Using image segmentation neural network model for motion representation in sport analytics</b></p> <p>Alexandr Kuznetsov, Anastasiia Kiian, Yevgen Kotukh, Serhii Florov and Tetiana Kuznetsova. <b>Generation of Pseudo-Random Sequences of the Maximum Period Using Elliptic Curves Transformations</b></p> <p>Vitaliy Tsyganok, Mykhailo Dubok and Olha Tsyhanok. <b>Quasi-inflection-Based Part-of-Speech Tagging of Texts for Expert Formulations Content Ambiguity Detection in Modeling Domain Knowledge</b></p> <p>Tatiana Neskorodieva and Eugene Fedorov. <b>Neural Network Models Ensembles for Generalized Analysis of Audit Data Transformations</b></p> <p>Fangfang Li, Sergey Krivenko and Vladimir Lukin. <b>An Automatic Optimization Method for BPG Compression Based on Visual Perception</b></p> <p>Serhii Holub, Svitlana Kunytska and Viktor Grechaninov. <b>Agent Functionals in Monitoring Information Systems</b></p> <p>М. Т. Дехтярук, В. М. Черевик <b>Імітаційне моделювання роботи перевантажувального комплексу з відносним пріоритетом обслуговування</b></p>

Wednesday, June 30, 2021

Video conference access:

<https://us02web.zoom.us/j/82740575485?pwd=cFN2VWIMQ25jN1VKYXNndk9qdzFvQT09>

Meeting ID: 827 4057 5485 Password: C962yD

Time	Activity
10:00-12:00	<p align="center"><b>Section 4 Mathematical modeling and simulation of special purpose equipment samples</b></p> <p>Session Chair: <b>Anatolii Pavlenko</b></p> <p>Ihor Korniienko, Svitlana Korniienko, Volodymyr Dmitriev, Anatolii Pavlenko and Dmytro Kamak. <b>Modeling and Analysis of the Main Statistical Parameters of the Testing System of Special Equipment</b></p> <p>Viktor Riabkov, Ruslan Tsukanov, Olexandr Dveirin, Liudmyla Kapitanova and Maryna Kyrylenko. <b>Issue of Airplane Modification Mass Variations Based on Their Structural Modelling</b></p> <p>Maksym Herashchenko, Kirill Bashinsky, Yurii Kamak, Serhii Nesterenko, Serhii Rudnichenko and Oleksandr Isachenko. <b>Decision Support with Bayesian Influence Network during UAV Flight Control</b></p> <p align="center"><b>Section 5 Mathematical modeling and simulation of systems in project management</b></p> <p>Session Chair: <b>Anatolii Pavlenko</b></p> <p>Nataliia Yehorchenkova, Oleksii Yehorchenkov and Anton Sazonov. <b>Modeling of Project Portfolio Management Process in Banking</b></p> <p>V.M. Gorbachuk, S.O. Gavrilenko, G.V.Golotsukov, D.I. Nikolenko. <b>The digital tools for decentralized patent accounting and management</b></p>
12:00-13:00	<p>Plenary session. Closing Ceremony.</p> <ul style="list-style-type: none"> <li>• Concluding reports of Section Chairs</li> <li>• Conference Summary – Volodymyr Kazymyr</li> <li>• Conference closing</li> </ul>

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## Part II Instructions for Presentations

### **Video Presentation**

Zoom Online Conference

<https://us02web.zoom.us/j/82740575485?pwd=cFN2VWlMQ25jN1VKYXNndk9qdzFvQT09>

Meeting ID: 827 4057 5485    Password: C962yD

### **Materials Provided by the Presenters:**

PowerPoint files

### **Durations of Presentation:**

Keynote Speech: 20 minutes of Presentation, 5 minutes of Q&A

Regular Speech: 10 minutes of Presentation, 5 minutes of Q&A

## Part III Conference Place

Chernihiv Polytechnic National University  
Shevchenko str. 95, 14035 Chernihiv, Ukraine

## Organizing Committee Contacts

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