

ISSN 2524-0382

Editor-in-Chief
Anatoliy Melnyk

Advances in Cyber-Physical Systems

**Досягнення
у кіберфізичних системах**

Volume 7 • Number 2



**Founder and Publisher
Lviv Polytechnic
National University**

2 0 2 2

Advances in Cyber-Physical Systems

Volume 7 • Number 2

2 0 2 2

Editorial Board

Editor-in-Chief:

Prof. **Anatoliy Melnyk**, Lviv Polytechnic National University, Ukraine

Associate Editor-in-Chiefs:

Prof. **Valerii Hlukhov**, Lviv Polytechnic National University, Ukraine

Executive Secretary:

PhD. **Bohdan Havano**, Lviv Polytechnic National University, Ukraine

Prof. **Oleksiy Azarov**, Ukraine

Prof. **Jesús Carretero**, Spain

D.Sc. **Alexander Chemeris**, Ukraine

Prof. **Vedat Coskun**, Turkey

Prof. **Mykhaylo Dorozhovets**, Ukraine

PhD. **Ahmed El-Rayis**, United Kingdom

Prof. **Volodymyr Golovko**, Poland

Prof. **Oleksandra Hotra**, Poland

Prof. **Orest Ivakhiv**, Ukraine

Prof. **Ryszard Kozera**, Australia

Prof. **Andriy Kupin**, Ukraine

Prof. **Gui-Lu Long**, China

Prof. **Viktor Melnyk**, Ukraine

Prof. **Mykola Mykijchuk**, Ukraine

Prof. **Volodymyr Opanasenko**, Ukraine

PhD. **Slawomir Pietrzyk**, Poland

Prof. **Sergiy Pogorilyy**, Ukraine

Prof. **Oksana Pomorova**, Poland

Prof. **Anatoliy Sachenko**, Ukraine

Prof. **Oleg Savenko**, Ukraine

Prof. **Leonel Sousa**, Portugal

Prof. **Domenico Talia**, Italy

PhD. **Volodymyr Turchenko**, Canada

PhD. **Ihor Vasytsov**, South Korea

Prof. **Tanya Vladimirova**, United Kingdom

Prof. **Jiafu Wan**, China

English Proofreader

Solomia Albota, Ukraine

Founder and Publisher

Lviv Polytechnic National University

Address for contacts:

Lviv Polytechnic National University
12, S. Bandery Str., Lviv, 79013, Ukraine

e-mail: acps.journal@gmail.com

Lviv Polytechnic

Publishing House

4, F. Kolessy Str., Lviv, 79013, Ukraine

Tel.: +38 032 258 4100

vlp@vlp.com.ua; <http://vlp.com.ua>

Printing Center of Lviv Polytechnic

Publishing House

4, F. Kolessy Str., Lviv, 79013, Ukraine

Tel.: +38 032 258 4100

© Lviv Polytechnic National University, 2022

Науковий журнал
"Досягнення
в кіберфізичних системах"

№ 2 (14) • 2022

Виходить двічі на рік з 2016 року.

Засновник і видавець

Національний університет "Львівська політехніка»

Контактна адреса:

Національний університет "Львівська політехніка"

вул. С. Бандери, 12, Львів, 79013, Україна

e-mail: acps.journal@gmail.com

Мова видання англійська.

Рекомендувала Вчена рада

Національного університету

"Львівська політехніка"

(протокол № 81 від 28.02.2022 р.)

ISSN 2524-0382

© Національний університет "Львівська політехніка", 2022

CONTENTS

- 63 Barsiienko Vladyslav, Vavruk Yevhenii**
Software Service for Optimization of the Work Processes
in Law Firms
- 70 Bilenko Volodymyr, Mohammed Kadim Rahma Rahma,
Hlukhov Valeriy**
Testing of the Random Codes Generator
of Embedded Crypto Protection System
- 76 Botchkaryov Alexey**
Coscheduling Spatial Self-organization
and Distributed Data Collection in Multi-agent System
- 83 Botchkaryov Alexey**
Multi-agent Coordination with Deferred Asynchronous Messaging
in a Distributed Coordination Space
- 91 Dudok Bohdan**
Adaptive Learning Service Based on Spacing Effect
- 101 Ivanov Yurii, Sharov Borys,
Zalevskyi Nazar, Kernytskyi Ostap**
Software System for End-Products Accounting
in Bakery Production Lines Based
on Distributed Video Streams Analysis
- 108 Ozdenizci Kose Busra, Yaya Senol,
Coskun Vedat and Mantar H. Ali**
WifiZoneCloud: A Cloud-Based Wi-Fi Hotspot Platform
- 115 Kotyk Vladyslav, Vavruk Yevhenii**
Comparative Analysis of Server and Serverless
Cloud Computing Platforms
- 121 Marii Bohdan, Zholubak Ivan**
Features of Development and Analysis of REST Systems
- 130 Pavlov Maksym, Yurchak Iryna**
Software Implementation of Modified LSB Algorithm
with Shamir's Secret Sharing
- 140 Pisotskyi Marian**
Approaches to Implementing
Video Data Management Service
with the Context-Aware Recommendation
- 147 Repianskyi Nazar, Rak Taras**
Client-Server Library Index Automation System
- 156 Tsiunyk Bohdan, Muliarevych Oleksandr**
Software System for Motion Detection and Tracking