

Preface

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Abstract

This is an introduction to a collection of selected papers from the Edge Computing Workshop (doors 2024), held in Zhytomyr, Ukraine, on April 05, 2024. The workshop covers topics such as algorithms and techniques for machine learning and AI at the edge, cellular infrastructure for edge computing, distributed ledger technology and blockchain at the edge, edge computing infrastructure and edge-enabled applications, edge-based data storage and databases, edge-optimized heterogeneous architectures, fault-tolerance in edge computing, fog computing models and applications, geo-distributed analytics and indexing on edge nodes, hardware architectures for edge computing and devices, innovative applications at the edge, interoperability and collaboration between edge and cloud computing, monitoring, management, and diagnosis in edge computing, processing of IoT data at network edges, programming models and toolkits for edge computing, resource management and Quality of Service for edge computing, security and privacy in edge computing and others. The workshop proceedings consist of an introduction and nine accepted articles that were painstakingly modified by the authors based on the discussion outcomes and were presented by the authors at the workshop. The papers were rigorously peer-reviewed and selected from 19 submissions.

Keywords

edge computing, edge device, IoT, UAV, distributed systems

1. Introduction

Edge Computing Workshop (doors) is a peer-reviewed international Computer Science workshop focusing on research advances and applications of edge computing, a process of building a distributed system in which some applications, as well as computation and storage services, are provided and managed by central clouds and smart devices, the edge of networks in small proximity to mobile devices, sensors, and end users; and others are provided and managed by the center cloud and a set of small in-between local clouds supporting IoT at the edge.

Since 2021, the workshop covers topics such as algorithms and techniques for machine learning and AI at the edge, cellular infrastructure for edge computing, distributed ledger technology and blockchain at the edge, edge computing infrastructure and edge-enabled applications, edge-based data storage and databases, edge-optimized heterogeneous architectures, fault-tolerance in edge computing, fog computing models and applications, geo-distributed analytics and indexing on edge nodes, hardware architectures for edge computing and devices, innovative applications at the edge, interoperability and collaboration between edge and cloud computing, monitoring, management, and diagnosis in edge computing, processing of IoT data at network edges, programming models and toolkits for edge computing, resource management and Quality of Service for edge computing, security and privacy in edge computing and others.

This volume represents the proceedings of the 4th Edge Computing Workshop (doors 2024), held in Zhytomyr, Ukraine, on April 05, 2024. It comprises 9 contributed articles that have been carefully peer-reviewed and selected from 19 submissions. At least three program committee members have

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examined each contribution, and they have all been reviewed for plagiarism, self-plagiarism, and fair referenceness.

2. doors 2024 committees

2.1. Program committee co-chairs

- *Tetiana A. Vakaliuk*, Zhytomyr State Polytechnic University, Ukraine
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2.4. Organizing committee

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- *Andrii Striuk*, Kryvyi Rih National University, Ukraine
- *Tetiana Vakaliuk*, Zhytomyr Polytechnic State University, Ukraine

3. doors 2024 organizers

The 4th edition of the doors was organized jointly by the Zhytomyr Polytechnic State University and the Academy of Cognitive and Natural Sciences (ACNS). ACNS, a non-governmental organization, is committed to developing researchers' knowledge of cognitive and natural sciences. Their mission involves advancing research, protecting individual rights and freedoms, and addressing professional, scientific, and social needs.

One of the noteworthy publications by ACNS is the *Journal of Edge Computing* (JEC, <https://acnsci.org/jec>), a peer-reviewed journal that delves into the realms of the Internet of Things, distributed systems, and edge computing. JEC focuses on scientific research on the utilization and implementation of edge computing across diverse domains such as education, science, medicine, and architecture.

ACNS also publishes such journals as *Educational Dimension* (<https://acnsci.org/ed>), *Educational Technology Quarterly* (<https://acnsci.org/etq>), *CTE Workshop Proceedings* (<https://acnsci.org/cte>). Notably, these journals cover a broad range of topics aligned with doors topics of interest:

- machine learning, deep learning and AI
- edge computing and edge devices
- distributed systems
- fault-tolerant computing
- UAV's
- IoT
- cloud and fog computing
- SMART house
- automated intelligent robotic platform
- biomedical systems
- GRID systems

4. Conclusion

The doors 2024 workshop was a resounding success, bringing together experts and professionals from various institutions and organizations to share their knowledge and ideas on edge computing. We express our gratitude to the Academy of Cognitive and Natural Sciences and Zhytomyr Polytechnic State University for their collaboration and support in the publishing of the *Journal of Edge Computing*.

We are immensely grateful to the authors and delegates who contributed to the success of the workshop by submitting their papers and participating actively in the discussions. We appreciate the efforts of the program committee members and the peer reviewers who provided their guidance, feedback, and support in improving the quality of the papers. Their valuable contributions and constructive critical comments helped to shape the content of the conference and made it a memorable experience for all participants.

We would like to acknowledge the developers and professional staff of the *Academy of Cognitive and Natural Sciences* (<https://acnsci.org>) and the *Not So Easy Science Education* platform (<https://notso.easyscience.education>) for providing us with the excellent and comprehensive conference management system that facilitated the smooth running of the workshop.

Since 2021, our workshop is **sponsored** by the CEUR Workshop Proceedings (CEUR-WS.org), the world best Diamond Open-Access proceedings publisher for Computer Science workshops. Long live CEUR-WS.org!

We believe that the presentations and discussions at the workshop have broadened our professional horizons and will serve as a catalyst for further research and innovation in the field of digital transformation in education. We look forward to meeting again in doors 2024 with renewed energy, enthusiasm, and a commitment to advancing the cause of edge computing.