

Lucian Blaga University of Sibiu, Romania

Faculty of Sciences

Research Center in Informatics and Information Technology

ICDD 2024

8th International Conference on Applied Informatics

Imagination, Creativity, Design, Development

Volume of Abstracts and Program

May 23-25, 2024

Sibiu, Romania

Eighth International Conference on Applied Informatics
Imagination, Creativity, Design, Development
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Motto:

“There are no limits, only your imagination”

TOPICS

- Algorithms and data structures
- Graph theory and applications
- Formal languages and compilers
- Cryptography
- Modeling and simulation
- Computer programming
- Computer vision
- Computer graphics
- Game design
- Data mining
- Distributed computing
- Artificial Intelligence
- Service oriented applications
- Networking
- Grid computing
- Mobile operating systems
- Scientific computing
- Software engineering
- Bioinformatics
- Robotics
- Computer Architecture
- Evolutionary Computing
- Multimedia Systems
- Internet Communication and Technologies
- Web Applications

OBJECTIVES

The conference is mainly addressed to young researchers from all over the world. The conference gives the participants the opportunity to discuss and present their research on informatics and related fields (like computational algebra, numerical calculus, bioinformatics etc.). The conference welcomes submissions of original papers on all aspects of informatics and related fields ranging from new concepts and theoretical developments to advanced technologies and innovative applications. All submitted papers will undergo a rigorous single-blind peer review process, with each paper being assessed by a minimum of two independent experts in the relevant field. Paper acceptance and publication will be judged on the basis of their relevance to the conference topics, clarity of presentation, originality and accuracy of the results and proposed solutions. The presentation (article) has also to include a computer application. The conference will include regular presentations (15min.) and short IT Companies presentations.

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Chair of the conference

- Prof. PhD. Dana Simian
Director of the Research Center in Informatics and Information Technology
Department of Mathematics and Informatics
Faculty of Sciences
Lucian Blaga University of Sibiu, Romania
E-mail: dana.simian@ulbsibiu.ro, d_simian@yahoo.com

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- Stud. Adrian Opreșor - Lucian Blaga University of Sibiu, Romania
- Stud. Elisei Daniel Prală - Lucian Blaga University of Sibiu, Romania
- Stud. Diana-Patricia Savoiu - Lucian Blaga University of Sibiu, Romania
- Stud. Luca-Constantin Todoran - Lucian Blaga University of Sibiu, Romania

OFFICIAL LANGUAGE

The official language of the conference is English.

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In alphabetical order:



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NTT Data

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PAN FOOD



Omeron Technologies, Romania



ProIT



ROPARDO



WENGLOR

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PROGRAM

International Conference on Applied Informatics – ICDD 2024
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THURSDAY, May 23th, 2024

NTT DATA Romania, 6th Floor, 1A Șerbota str., Sibiu

08:45-09:30 **Registration**

09:30-09:50 **Opening ceremony**

10:00-11:30 **Papers presentation - Chair Prof. Dr. Dana Simian**

1. *Dynamic Graphics in Live Streaming: OBS Addon for Custom Lower Thirds*, **Felix Husac**, Romania
2. *TicketGO: Mobile applications for purchasing and managing bus tickets in Pitești*, **Ioana-Valeria Turcin, Eduard-Alexandru Oprea, Elena-Luiza Buzatu**, National University of Science and Technology Politehnica Bucharest, Pitești University Center, Romania
3. *Automatic text assistance for enhancing the search in an university web page*, **Marin-Eusebiu Șerban**, Lucian Blaga University of Sibiu, Romania
4. *Technology of monitoring incubators to save premature babies*, **Giorgiana-Maria Marangoci, Cosmin-Lucian Pal, Sorin Ionuț Conea, Cătălina Dumitru, Daniela-Alexandra Podoreanu**, Vasile Alecsandri University of Bacău, Romania
5. *Automated Calibration Robot with LiDAR Self-Localization*, **Sebastian Baader, Tamara Bergerhoff, Max Werner, Meik Filipov**, Technical University of Applied Sciences Würzburg-Schweinfurt, Germany
6. *Development challenges of a verification IP for I²C communication*, **Darius Codruț Pavel**, Transilvania University of Brasov, Romania

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- 11:30-12:00** **Coffee break**
- 12:00-13:15** **Papers presentation - Chair Prof. Dr. Peter Braun**
1. *Digital logic, from relays to embedded*, **Radu-Andrei Căpățînă**, Transilvania University of Brasov, Romania
 2. *Impact of AI Companions on Loneliness and Parasocial Interactions in Young Adults*, **Niklas Groffner**, Technical University of Applied Sciences Würzburg-Schweinfurt, Germany
 3. *Wise Time Manager*, **Radu-Roland Roșoga**, Lucian Blaga University of Sibiu, Romania
 4. *From Notes to Harmony: An Insight into Musical Theory*, **Andrei Maria**, Lucian Blaga University of Sibiu, Romania
 5. *Studies in selecting and optimizing Machine Learning algorithms*, **Mioara Lupe**, Lucian Blaga University of Sibiu, Romania
- 13:30-15:30** **Lunch break – Restaurant Împăratul Romanilor Sibiu**
- 15:30-17:15** **Papers presentation - Chair Assoc. Prof. Dr. Florin Stoica**
1. *The future of passwords*, **Eugen Cojocaru**, GSD, Romania
 2. *Simulated Environment with Personality Driven Agents*, **David Zoltan Kallai**, Babes-Bolyai University, Cluj-Napoca, Romania
 3. *Communication with AI: The Influence of the Transmission Medium on AI Acceptance*, **Marie Herz**, Technical University of Applied Sciences Würzburg-Schweinfurt, Germany
 4. *Multi-Factor Authentication Simulation Software based on Biometric Characteristics*, **Vlăduț Mădălin Gidea**, Spiru Haret University, București, Romania
 5. *The Functionality of Graphic Engines*, **Matei-Cristian Steavu**, Radu Negru National College, Făgăraș, Romania– online
 6. *Performance Analysis of IceNet Model for Prediction of Sea Ice Cover*, **Madelyn Holveck**, Trinity University, USA – online
 7. *Prostate Cancer Diagnosis assisted by Artificial Intelligence*, **Santiago Salimbeni (MD)**, **Santiago Nicolet (Eng.M)**, Universidad del Salvador Research Institute of Science and Technology, Argentina – online
- 18:30-20:00** **Dinner – Restaurant Împăratul Romanilor Sibiu**
- 20:00-21:30** **Sibiu by night (walking in the Sibiu downtown)**

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FRIDAY, May 24th, 2024

NTT DATA Romania, 6th Floor, 1A Șerbota str., Sibiu

09:00-10:15 **Papers presentation - Chair Assoc. Prof. Dr. Nicolae Constantinescu**

1. *Applications of Sound Anomaly Detection*, **Costin Constantinescu**, NTT DATA Romania
2. *Strategies for Optimizing Pharmaceutical Logistics: A Focus on Transportation Efficiency*, **Cezar-Marian Păpară, Alex-Andrei Rîpan**, Alexandru Ioan Cuza University of Iași, Romania
3. *The Perception and Potential of Artificial Intelligence in Sexual Education*, **Pauline Weber**, Technical University of Applied Sciences Würzburg-Schweinfurt, Germany
4. *GPAssistant Medical Software*, **Bozhidar Dachev**, University of Ruse "Angel Kanchev", Bulgaria
5. *Audio-Studio Streaming Web Platform*, **Ionuț-Marius Iordan, Valentina-Florina Toma, Andrei-Marius Dumitrașcu**, National University of Science and Technology Politehnica Bucharest, Pitești University Center, Romania

10:15-10:45 **Coffee break**

10:45-12:00 **Papers presentation - Chair Assoc. Prof. Dr. Florin Stoica**

1. *Scientific presentation*, **Gabriela Căndea**, ROPARDO, Romania
2. *Robot solving maze*, **Ștefăniță Denis Udrea, Cristian-Alexandru Ene, Bogdan Ștefan Calafățeanu, Andreea Roxana Lețu**, University of Craiova, Romania
3. *Virtual_Gym_Coach*, **Matei Roman, David Roman**, Titu Maiorescu College of Aiud, Romania
4. *Dog Activity Detection and Recognition*, **Bushra Najeeb Syeda, Dhruval Bhuvra, Aniket Kulkarni**, Technical University of Applied Sciences Würzburg-Schweinfurt, Germany
5. *Web-based Application to Provide Translation of Texts in Comic Books*, **Valentin Cojocari, Petru Lunic, Vasile Alecsandri** University of Bacău, Romania

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12:00-12:30	Coffee break
12:30-13:45	Papers presentation - Chair Prof. Dr. Dana Simian <ol style="list-style-type: none">1. <i>Predictive Policing: Societal Acceptance in the Field of Ethical Controversies - A Quantitative Study</i>, Eliana Virgilio, Technical University of Applied Sciences Würzburg-Schweinfurt, Germany2. <i>Optimization techniques for generating volumetric planetary environments</i>, Daniel-Vlad Sasu, Babes-Bolyai University, Cluj-Napoca, Romania3. <i>Smart pet feeder with video monitoring</i>, Mariana-Casiana Blana, Mihai Nicolae Zăbavă, Elisei Daniel Prală, Lucian Blaga University of Sibiu, Romania4. <i>Cosmic Journey</i>, Luca Todoran, Diana Savoiu, Lucian Blaga University of Sibiu, Romania5. <i>The Search for the Time Travelling Dog</i>, Matei-Ioan Hămbășan Andra-Maria Uleșan, Samuel von Brukenthal National College, Sibiu, Romania
13:45-15:00	Pizza break
16:15	Closing ceremony – NTT DATA, 6th FLOOR
18:00	Official Dinner - Restaurant Împăratul Romanilor Sibiu

SATURDAY, May 25th, 2024

International Conference on Applied Informatics – ICDD 2024
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08:00-20:00	Trip on the route Sibiu - Sighișoara - Rupea Citadel - Esmerald Lake (Racoș) - Făgăraș Citadel – Sibiu
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A B S T R A C T S

Automated Calibration Robot with LiDAR Self-Localization

*Sebastian BAADER, Tamara BERGERHOFF, Max WERNER,
Meik FILIPOV*

In order to locate a smartphone precisely inside a building, common localization techniques rely on radio measurements. These and other sensor data are mapped to certain positions, such that the smartphone can derive its position from the current values. The calibration for this purpose, called fingerprinting, can require a lot of effort and time when executed manually. To remedy this, our work aims to automate this process by using a robot, which is also equipped with a LiDAR sensor for self-localization. Our solution incorporates a SLAM approach and several path planning algorithms to guide the robot through the building. The current position of the robot is periodically transmitted towards a smartphone, which is placed on top. It collects all available sensor data and handles the fingerprinting. The evaluation of the robot's localization and behavior delivers consistent and proper results in various test scenarios.

Smart pet feeder with video monitoring

*Mariana-Casiana BLANA, Mihai Nicolae ZĂBAVĂ,
Elisei Daniel PRALĂ*

The objective of the project is to provide an intelligent and automated solution for feeding and monitoring pets. With a build-in camera and a pre-trained model in object detection, the device can be a solution for pet supervising.

Digital logic, from relays to embedded

Radu-Andrei CĂPĂȚÎNĂ

This paper explores the progress of digital logic. In our current era, computers and digital controllers are perceived as a black magic device. However, to fully appreciate the beauty of those devices that are so small, yet so powerful we need to go back in time, to when things were simpler and easier to understand. This project tries to explain the history of modern logic and how computers started "thinking" by themselves by building a scaled version of an elevator using modern microcontrollers.

These were the first machines to utilize extensive logic systems, firstly by using relays and nowadays by using embedded devices that can be smaller than a thumb.

Web-based Application to Provide Translation of Texts in Comic Books

Valentin COJOCARI, Petru LUNIC

When venturing into the pages of books written in foreign languages, readers may experience moments of frustration when encountering unfamiliar words or complex phrases that hinder the understanding of the text. To address this issue, there are already a series of specialized products and platforms on the market that assist readers by facilitating quick access to translations of confusing passages.

Our paper provides support for the foreign language learners using comic books. We developed a website which offers comic books, using JavaScript/TypeScript, with the full-stack framework Next.js, where the connection between Frontend and Backend is made through the GraphQL technology, and using the NextUi component library for React. At the click of a button, the image with foreign language text is replaced with the same image accompanied by text translated into the reader's familiar language. This functionality not only makes it easier to learn new words, but also to support the user to understand the context of the foreign language text.

In the future, we plan to expand the library offered by the website with a wide range of books, in different languages, thus giving the users the opportunity to learn foreign languages in an engaging and interactive way.

GPAssistant Medical Software

Bozhidar DACHEV

GPAssistant is an innovative medical software that allows automation of various activities of the general practitioner. The software enables doctors to receive advice for diagnosis by entering symptoms of a given patient and recommendations for treatment with appropriate medications. Additionally, it has the capability to track whether a patient has allergies and, if so, to alert the doctor about it. Other functionalities of the software include scheduling patient appointments on specific dates and times when they request it on the platform, aiming to optimize the time of both patients and general practitioners. It also conducts automated campaigns for disease prevention and timely detection, as well as automatically informs patients about mandatory vaccinations, immunizations, and revaccinations.

Multi-Factor Authentication Simulation Software based on Biometric Characteristics

Vlăduț Mădălin GIDEA

This research introduces an innovative multi-factor authentication (MFA) approach that utilizes biometric traits to improve security standards in digital systems. Our methodology combines many biometric modalities, such as fingerprints, facial recognition, and iris scans, into a unified framework for multi-factor authentication (MFA). The main goal is to create an authentication system that is resilient against different types of

security threats while still being easy for users to use. First, we will examine the weaknesses of conventional MFA (Multi-Factor Authentication) systems and explore the possibility of using biometric data as a more robust and dependable method of verification. Next, we provide a comprehensive explanation of the structure of our proposed Multi-Factor Authentication (MFA) system, which employs a fusion of biometric data with conventional security mechanisms such as passwords and security tokens. The hybrid method seeks to achieve a harmonious balance between security and usability, by reducing the likelihood of illegal access while guaranteeing a smooth and uninterrupted user experience. To assess the efficacy of our proposed approach, we performed a series of experiments that involved simulating authentication scenarios with various attack routes. The results indicate substantial enhancements in security and reliability compared to current MFA techniques. In addition, we analyse the consequences of protecting biometric data privacy and provide methods to ensure the security of user information in our authentication system. The idea behind this work wishes to become a potential contribution by considering improvements related to behavioural biometrics using MFA scheme, such as incorporating behavioural biometrics and machine learning techniques to dynamically augment security measures based on user interaction patterns. Our study enhances the continuous advancement of authentication methods that are safer and more efficient, ensuring a greater level of data protection and user privacy in an ever-growing digital environment.

Impact of AI Companions on Loneliness and Parasocial Interactions in Young Adults

Niklas GROFFNER

This research investigates the impact of artificial intelligence (AI) companions on alleviating loneliness and enhancing parasocial relationships among young adults. Employing the AI system Replika, the research utilizes a robust methodology that integrates the UCLA Loneliness Scale and the Parasocial Interaction Scale (PSI) with comprehensive qualitative interviews. The data indicate that although loneliness levels changed during the research period, the intervention with AI companions did not result in a statistically significant reduction in overall loneliness. Regarding parasocial relationships, initial enthusiasm was noted; however, the relationships did not develop depth, primarily due to the superficial nature of interactions with AI. The qualitative interviews exposed a dichotomy in attitudes towards AI's role in emotional support, with some participants valuing the nonjudgmental listening capabilities, while others criticized the AI's lack of authentic empathy and understanding. These findings highlight the intricate dynamics of human-AI interactions and underscore the critical need for enhancements in AI's emotional intelligence to more effectively mitigate loneliness and foster substantial parasocial connections. Additionally, the study identifies significant deficiencies in AI's communication abilities, with participants reporting dissatisfaction with the AI's lack of nuanced conversational

skills, emphasizing the urgent need for sophisticated linguistic capabilities in AI systems to facilitate more meaningful engagements.

The Search for the Time Travelling Dog

Matei-Ioan HĂMBĂȘAN, Andra-Maria ULEȘAN

“The Search for the Time Travelling Dog” is an interactive educational game dedicated to learning foreign languages. The game is crafted as a story depicting a child's search for their lost dog in the abandoned house of a scientist. To progress, the player must navigate through multiple levels that will enhance their linguistic abilities through interactions with various objects and the surrounding environment. In this regard, various categories of games have been implemented, incorporating elements of an Escape Room, Platformer, and Fighting Game. Interacting with his surroundings gives the player the chance to expand his vocabulary and also put it to the test with various mini-games that alter the narrative. The project is developed using the Greenfoot environment and Java language, while the graphics are created in 2D format using the professional application Procreate.

Communication with AI: The Influence of the Transmission Medium on AI Acceptance

Marie HERZ

The goal of this quantitative study is investigating whether there is a difference in technology acceptance depending on the type of communication: audio or written text. Based on the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and the Media Richness Theory, the study showed several significant differences between the audio- and text-based communication groups. For example, experience scores were significantly higher in the written communication group, while hedonistic motivation was higher in the verbal communication group. The influencing factors of habit and social influence also showed a significant difference between the groups, with the written communication group showing a higher influence for both factors. Overall, the written communication group showed a significantly more positive influence on technology acceptance, even though a different result was to be expected according to the Media Richness Theory. These results underline how important it is to consider the type of communication in order to understand technology acceptance behavior.

Performance Analysis of IceNet Model for Prediction of Sea Ice Cover

Madelyn HOLVECK

Ice formation in arctic bodies of water varies seasonally and with climate factors, including global warming. Predicting ice formation patterns can help make decisions for economics, transportation, local communities, and public safety. Physics simulations have long been applied to forecast ice formation, however, they are expensive and only forecast for a short period of time. IceNet, a deep learning model, was developed to address this issue using significantly less costly and potentially more long-term predictions. It was determined that pre-trained Icenet models can successfully forecast in personal computer environments, using 2 years of previous forecast data from all 50 input dataset dimensions. However, the current Icenet architecture is too large to train in personal computer memory restrictions. A modified Icenet U-net model which only reads from one dataset can be trained on 6 years of data at a time in a personal computer environment, with a batch input of 2. These epochs take 16-24 minutes to complete. Forecasts trained in this way only differed by few decimal points from the forecast of the untrained model.

Dynamic Graphics in Live Streaming: OBS Addon for Custom Lower Thirds

Felix HUSAC

In the competitive landscape of online live broadcast production, the importance of visual elements that enhance branding and engagement cannot be overstated. This paper introduces an OBS (Open Broadcast Software) dockable addon that provides onscreen animated graphics for live streamings and recordings. Integrated via OBS docks, using browser sources for showing on screen overlays, and Local Storage for data retrieval and communication, the proposed addon aims to optimize the broadcasting workflow by offering interactive live graphics in a swifter manner than the traditional Adobe Photoshop or After Effects workflows. Offering multiple command interfaces and customizable features such as lower thirds, tickers, and on-screen graphics, users can tailor colors, animations, duration, and the content displayed to their preference. Unlike other competitors, the app allows a virtually unlimited number of graphics, supports setup saving for swift recall between shows, and functions offline for recording purposes or in the absence of internet connectivity. With scalability in mind and minimal CPU resource usage, this app offers creators an efficient tool for enhancing the visual experience and streamlining the production process, with plans for future expansions.

Audio-Studio Streaming Web Platform

*Ionuț-Marius IORDAN, Valentina-Florina TOMA,
Andrei-Marius DUMITRAȘCU*

We are all acquainted with audio-video streaming platforms like YouTube, Spotify, Apple Music, as well as Shazam. These applications have actually ended up being an integral part of our lives supplying accessibility to a selection of web content, from songs plus videos to TV programs together with podcasts. Ultimately, this has become an ecosystem that needs us to use multiple applications to achieve a common purpose. Thus, it is beneficial to have a system that incorporates all these solutions right into a single, easy to use application, accessible to every person. With that in mind, we decided on this theme since we intend to establish such a system. This would certainly be a solution for customers that desire accessibility to all these features in one area without needing to change in between numerous applications, all within a freemium design, that makes use of all the features that are free from all the platforms mentioned above, as well as customers memberships to the premium aspects of these services.

Simulated Environment with Personality Driven Agents

David Zoltan KALLAI

This paper presents a multi-agent system that aims to simulate human behavioral patterns with different personality traits present. These characteristics are incorporated into the agent's functionalities and the

simulation makes the best use of these to generate outcomes. We use large language models to convert the surrounding environment of each agent into feasible actions that are chosen based on their personalities. The main aim of the paper is to analyze how different agents with different traits interact with each other and whether they succeed or fail to accomplish their designated task as a team.

Cosmic Journey

Luca TODORAN, Diana SĂVOIU

In the context of digital innovation, “Cosmic Journey” emerges as a significant advancement in the field of scientific education, introducing a cutting-edge application that facilitates simulated travel experiences through the celestial bodies of our solar system. This platform surpasses traditional learning paradigms by merging educational content with immersive interactions, aiming to ignite curiosity and expand the understanding of the cosmos. Utilizing state-of-the-art technology, including artificial intelligence for the creation of stunning visual imagery, “Cosmic Journey” provides an accessible and engaging means to explore the mysteries of space.

By enabling a journey of personalized discovery, where users can select their own path of exploration, from the volcanic landscapes of Io to the rings of Saturn, the application unlocks unique learning experiences for each celestial destination. This approach promotes a deep understanding of complex astronomical concepts, transforming them into memorable and

visually narrative experiences. Thus, “Cosmic Journey” not only fuels a passion for astronomy but also reimagines learning as an active process, driven by creativity and wonder.

In essence, “Cosmic Journey” represents an innovation in the evolution of scientific education, offering a comprehensive and captivating learning environment that facilitates the exploration of the universe. This application promises to inspire a new generation of space enthusiasts, contributing to a profound appreciation for the science and magnificence of the cosmos.

Studies in selecting and optimizing Machine Learning algorithms

Mioara LUPE

This paper contributes to enhancing the model selection process for various supervised machine learning approaches. It proposes a software application that provides users with increased flexibility in model selection without the need for coding. The application enables different methods of splitting and shuffling the training data, and offers a variety of machine learning models whose performances can be assessed.

Technology of monitoring incubators to save premature babies

Giorgiana-Maria MARANGOI, Cosmin-Lucian PAL,
Sorin Ionuț CONEA, Cătălina DUMITRU,
Daniela-Alexandra PODOREANU

New-Born incubators have an important role for premature babies. Their scope is to develop the babies in optimal conditions so that they can face the outside environment. For their evolution, an incubator needs some important sensors like the pulse one or the temperature one. Thanks to evolved technology, the characteristics of specialized sensors are used to monitor premature babies in combination with an Arduino UNO microcontroller for efficient management of the development process. The microcontroller through vital sensor performs the reading of data that is then sent to medical personnel with the help of Internet of Things. In this way, possible critical conditions of premature babies that may appear because of their evolution can be efficiently prevented. This article presents a hardware implementation in order to increase the efficiency of the incubator, the problems that may arise and the simulation of an incubator.

From Notes to Harmony: An Insight into Musical Theory

Andrei MARIA

The paper proposes an innovative online platform designed to provide beginners with a comprehensive understanding of musical theory essentials. Through a user-friendly interface, visitors are introduced to the building blocks of music theory, including scales, intervals, chords, and arpeggios. Moreover, the site delves into the significance of understanding musical theory in shaping the expressive potential of music.

Strategies for Optimizing Pharmaceutical Logistics: A Focus on Transportation Efficiency

Cezar-Marian PAPAŢĂ, Alex-Andrei RÎPAN

This article explores the concepts of structuring road transport networks, optimization strategies, and their implications for pharmaceutical logistics optimization. Additionally, two optimization methods are presented, and their impact is analysed in terms of identifying the optimal route, computational resource requirements, and execution efficiency, along with pros and cons for each method. A national-level transport network in Romania is constructed, and various datasets and results are elucidated.

Development challenges of a verification IP for I²C communication

Darius Codruț PAVEL

Functional verification represents the most resource consuming step in the design stage of an integrated circuit. For this reason, shortening the verification time leads to a significant reduction of the time-to-market coefficient for integrated circuits. Due to increased complexity of electronic devices, companies often use third-party components for verifying a digital design. Often, buying and adopting such a component is more affordable (considering both time and price) compared to developing the same component in-house. This paper aims to present the development challenges for a verification IP which can be used for verifying designs which embed I²C communication. This verification IP approaches all features of I²C protocol, including arbitration, various clock generation patterns and masters being addressed. The original way of solving issues met while creating the signal generators, sequence item and drivers make from this paper an exponent of how multiple entities can collaborate to create electronic devices, putting together their experience, and using the same framework (UVM library) which allows easier intercommunication between verification subsystems.

Virtual_Gym_Coach

Matei ROMAN, David ROMAN

Our application helps beginners lead a healthy lifestyle, offering them a virtual trainer just a click away. By using AI technologies, it simulates the presence of a real gym coach, monitoring your position while you are training and giving you live feedback about your mistakes and possible solutions for them. When the training begins the web cam will turn on and start sending a video feed to our app. This is where artificial intelligence comes in handy, by analyzing each frame it will determine the positioning of some points on the athlete's body (in this case, the shoulder, the elbow, and the wrist) and determine if it is within the margin of error permitted by the program. If it does not fit, the app will make you aware of your mistake.

Another feature of this app is that we also built a device called "Vivens-meter" (the core of it is a modified Raspberry Pi Pico board) that can measure your BPM and send it to the app using Bluetooth. If the BPM exceeds a certain value, the training will automatically stop to protect the athlete's health. In addition, the app is able to connect to our server and save data on the cloud, so by simply creating an account on our website, your progress will be saved and accessible on any device. Also, if a user finishes the programs created by our app and reaches a certain level of experience, he will become an advanced member and will be able to create

his own program and post it in our app (without any programming skills), so other people will have a greater variety of workouts.

Wise Time Manager

Radu-Roland ROȘOGA

The aim of this paper is to showcase an Android Mobile Application developed with the goal of enhancing user experience compared to other Daily Planner Applications and one which contains all features needed for a modern Time Management Application.

The main results consist of an application with Notepad, Task Manager, Daily Planner functionality, which also has enhanced features like note/task category management, implements a register and login system, linked with a web server, a photo/video/audio saving and editing tool and a timer for daily task planning.

Prostate Cancer Diagnosis assisted by Artificial Intelligence

Santiago SALIMBENI, Santiago NICOLET

Prostate cancer is one of the most common malignant tumors worldwide. In Argentina, it has an incidence categorized as medium-high, based on the data provided by the Global Cancer Observatory. The diagnostic algorithm used for this disease requires the implementation of invasive techniques (biopsy), which carry its complications and could jeopardize the patient's

health. There is a need for a tool that can minimize the execution of unnecessary biopsies. In this work, we review the role of Artificial Intelligence (AI) in the prostate cancer diagnosis and its potential to avoid unnecessary biopsies; software tools that exist nowadays, their reach and limitations. Also, it is proposed the creation of an integral AI model, affordable for the public hospitals in Argentina and the region, that assists in the diagnosis of prostate cancer, using as inputs both, clinical data from patients as well as prostate images.

Optimization techniques for generating volumetric planetary environments

Daniel-Vlad SASU

Since the dawn of video games and until now, numerous attempts have been made to simulate realistic planetary environments utilizing various generation techniques. Given the recent trends in exploration-based games, an optimized workflow is required for simulating large portions of terrain that can be modified at runtime. The widely used marching cubes algorithm is a way of rendering volumetric terrain, but its demanding nature makes it difficult to implement on a larger scale. This paper aims to provide a generic approach for constructing full-volume procedural planetary bodies, allowing designers to adjust various settings until they achieve a desired configuration. Numerous strategies will be discussed for further enhancing performance, visual fidelity, realism and the player's enjoyment. Based on defining clear parameters over a layer-based

workflow, the presented Layer-Based Optimization model, or LBO, enables an intuitive iteration process for designing both single planets and archetypes that are intended to be generated procedurally.

Automatic text assistance for enhancing the search in an university web page

Marin-Eusebiu ȘERBAN

The web pages of universities serve as primary platforms for disseminating information related to the academic process to interested audiences. Among the various functions of these websites, the search process plays a crucial role in facilitating interaction between users and the available information.

This article aims to propose an automated textual assistance system for searches, integrating elements from the field of artificial intelligence. The system is built upon a trained model capable of contextually reconstructing text affected by potential errors.

To validate our proposed solution, we developed a website featuring information about several universities in Romania. Within this website, we seamlessly integrated the proposed search system

The Functionality of Graphic Engines

Matei-Cristian STEAVU

Graphics engines are applications that are used a lot in video games, in CAD software e.g. to visualize problems, yet not many people understand how those graphics engines work. This paper has the purpose of presenting how a graphic engine works with the help of a graphic engine made in C++ as well as illustrating some ways to better a graphic engine made from scratch.

Dog Activity Detection and Recognition

Bushra Najeeb SYEDA, Dhruval BHUVA, Aniket KULKARNI

This paper presents a comprehensive study on a sensor-based dog activity recognition system aimed at enhancing canine well-being. Utilizing wearable sensors and machine learning algorithms, the research explores methodologies for data collection, annotation, preprocessing, and model training. The system demonstrates a promising accuracy rate of 79% in identifying activities such as lying, sitting, walking, and running, with particular success in recognizing stationary behaviors. Challenges in hardware selection and the practical implementation of wearable technology are addressed, highlighting the system's potential for real-time monitoring and scalable solutions. Future work focuses on expanding the system's applicability to a wider range of dogs and developing mobile applications for user-friendly monitoring. The study contributes to

advancing pet care technology, offering pet owners reliable tools for tracking their dogs' behaviors and promoting animal welfare through technological innovations.

TicketGO: Mobile applications for purchasing and managing bus tickets in Pitești

*Ioana-Valeria TURCIN, Eduard-Alexandru OPREA,
Elena-Luiza BUZATU*

Public transport ticketing systems encounter persistent challenges in maintaining a delicate balance between security, convenience, and passenger privacy. While traditional paper tickets remain vulnerable to forgery and loss, digital solutions raise concerns regarding data security. This paper delves into a proposed system engineered to mitigate these issues by harnessing encrypted Mifare Classic cards for secure fare validation alongside dynamic QR codes within a public transport ticketing framework. The accompanying client application empowers travelers to verify the legitimacy of their memberships, trip cards, and validation status, obviating the necessity for physical tickets. Additionally, the client application facilitates ticket purchasing and membership management through a secure payment engine, ensuring the integrity of financial transactions without compromising user privacy. This approach streamlines the ticket procurement process, curtails paper usage, and contributes to environmental conservation efforts. Inspectors, colloquially referred to as conductors, can utilize a specialized application for

expedited ticket scanning and NFC card authentication, employing the aforementioned algorithm to optimize ticket inspections within public transport networks. This way we can improve and simplify ticket purchasing and management, promote sustainability, and enhance the travel experience, making public transportation more efficient and comfortable.

Robot solving maze

*Ștefaniță Denis UDREA, Cristian-Alexandru ENE,
Bogdan Ștefan CALAFETEANU, Andreea Roxana LEȚU*

Training a robot using computer vision methods in order to be able to solve a maze by using a DFS search and following a black line. The algorithm constructs a real-time map that simplifies the path from the source to the destination.

Predictive Policing: Societal Acceptance in the Field of Ethical Controversies - A Quantitative Study

Eliana VIRGILIO

Given the increasing use of Predictive Policing technologies and their ethical implications, this study examines the relationships between the acceptance of these technologies, ethical considerations, and the perspectives of Generations Y and Z. Employing a quantitative research design, the attitudes and ethical considerations of 128 participants were

analyzed using a Likert scale. The results indicate no significant differences in the ethical evaluation of Predictive Policing between Generations Y and Z. However, the correlation analysis reveals significant associations between ethical concerns and the acceptance of Predictive Policing. These findings underscore the importance of ethical considerations in the assessment of Predictive Policing and highlight the need for further research to develop a deeper understanding of the ethical dimensions of this technology.

The Perception and Potential of Artificial Intelligence in Sexual Education

Pauline WEBER

This study investigated the perception and potential of artificial intelligence (AI) in the sexual education of children and adolescents. Through qualitative guided interviews with the test of a GPT specially configured for sexual education with a diverse group of participants, the study offers a variety of perspectives on the topic. Insights were gained in four main categories: personal sex education experiences, attitudes towards AI in sex education, patterns of interaction with the tool, and perceptions and evaluations of the tool's usefulness and accessibility. The study emphasizes that different age groups have different expectations of sex education, which could already be expected from the UTAUT2 model. Furthermore, it was found that there are gender-specific differences in the attitudes and requirements for sexuality education, which points to the

need for individually adapted education methods. Limitations of the study include the phenomenon of socially desirable responses and non-response bias, which can lead to a biased sample. The outlook of the study emphasizes the importance of further research on the design of youth-friendly AI tools, the consideration of gender-specific needs and the development of AI-based educational concepts for public institutions. The aim is to develop effective, accessible, and ethically responsible AI-based tools.

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