"Lucian Blaga" University of Sibiu Faculty of Sciences

International Conference on Applied Informatics

"IMAGINATION, CREATIVITY, DESIGN, DEVELOPMENT"

Program & Abstracts

SIBIU, ROMANIA May 17-19, 2018

"IMAGINATION, CREATIVITY, DESIGN, DEVELOPMENT" Sibiu, May 17-19, 2018

Motto:

"There are no limits, only your imagination"

TOPICS

- Algorithms and data structures
- Graph theory and applications
- Formal languages and compilers
- Cryptography
- Modelling 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

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OBJECTIVES

The conference is mainly addressed to bachelor and master level students, Dr students and 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. The presentation has to include also a practical application. The conference will include regular presentations (20 min.) and scientific presentations given by IT companies.

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Organized by:

Research Center in Informatics and Information Technology Department of Mathematics and Informatics Faculty of Sciences ''Lucian Blaga'' University of Sibiu

Organized with support of Romanian Ministry of National Education



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"IMAGINATION, CREATIVITY, DESIGN, DEVELOPMENT" Sibiu, May 17-19, 2018

OUTLINE PROGRAM

THURSDAY, May 17, 2018

Faculty of Sciences, Sibiu, Dr. I. Rațiu st., No. 5-7 1st Floor, Room A18

- $8^{30} 9^{30}$ Registration
- $9^{30} 9^{50}$ **Opening ceremony**
- $9^{50} 10^{10}$ IT companies presentations (ProIT)
- $10^{10} 11^{50}$ Papers presentation

11⁵⁰– 12⁰⁰ **Coffee break**

- $12^{00} 13^{40}$ Papers presentation
- 13⁵⁰ 15⁰⁰ Lunch University canteen
- $15^{00} 16^{20}$ **Papers presentation**
- **16²⁰ 16³⁰ Coffee break**
- $16^{30} 18^{10}$ Papers presentation
- 18¹⁰ 19⁰⁰ **Pizza break**
 - 19⁰⁰ Social program: Sibiu by night. Visit of the old city center Sibiu Jazz Festival. Sibiu Big Square. <u>http://sibiujazz.ro/ro/program/</u>

"IMAGINATION, CREATIVITY, DESIGN, DEVELOPMENT" Sibiu, May 17-19, 2018

FRIDAY, May 18, 2018

Faculty of Sciences, Sibiu, Dr. I. Rațiu st., No. 5-7 1st Floor, Room A18

- $9^{00} 10^{00}$ Papers presentation
- $10^{00} 10^{20}$ IT companies presentations (NTT Data)
- $10^{20} 10^{40}$ Coffee break
- $10^{40} 12^{00}$ Papers presentation
- $12^{00} 12^{20}$ Coffee break
- $12^{20} 14^{00}$ Papers presentation
- 14⁰⁰-15³⁰ Lunch University canteen
- $16^{45} 17^{15}$ Official closing and awards ceremony Faculty of Sciences, A18 Room
- 17⁴⁵- 20³⁰ Official conference dinner University canteen

SATURDAY, May 19, 2018

- 8⁰⁰ 20⁰⁰ **Trip on the route** Sibiu Fagaraş Bran Castle (Dracula`s Castle) The Rupestra Monastery Şinca Veche Sibiu
- 20⁰⁰⁻23⁰⁰ **Social program:**

Sibiu Light Festival (Sibiu, Sub Arini Park) http://sibiunews.net/articole/21-special/18789-festivalul-luminii-la-sibiu.html

Sibiu Jazz Festival (Sibiu Big Square) http://sibiujazz.ro/ro/program/

"IMAGINATION, CREATIVITY, DESIGN, DEVELOPMENT" Sibiu, May 17-19, 2018

PROGRAM

THURSDAY, May 17, 2018

Faculty of Sciences, Sibiu, Dr. I. Rațiu st., No. 5-7 1st Floor, Room A18

- 8³⁰ 9³⁰ **Registration**
- $9^{30} 9^{50}$ **Opening ceremony**
- $9^{50} 10^{10}$ IT companies presentations (ProIT)
- $10^{10} 11^{50}$ Papers presentation Chair Prof. Dr. Dana Simian
 - Autonomous navigation system based on data acquisition, Constantin Robert Ciolompu, "Lucian Blaga" University of Sibiu, Romania
 - Affinity Propagation as an algorithm for segmentation problems in business intelligence, **Moritz Heusinger**, University of Applied Sciences Würzburg–Schweinfurt, Germany
 - Termohub IoT web service, Borislav Kosharov, University of Ruse, Bulgaria
 - Services marketplace web app, Gheorghe-Cătălin Crișan, "Lucian Blaga" University of Sibiu, Romania
 - Online Rendering Tools and Design in Blender, Alexandru Pintea, "Emil Racovita" College of Cluj-Napoca, Romania

$11^{50} - 12^{00}$ Coffee break

12⁰⁰ – 13⁴⁰ **Papers presentation – Chair Prof. Dr. Milan Tuba**

- Smart app for your smart home, Maria Alexandra Băilă, "Lucian Blaga" University of Sibiu, Romania
- Automated Car Parking System, Andrei-Timotei Ardelean, Marius Ciocan, Transilvania University of Brașov, Romania
- Secret synergy effects from physics and predictive analytics The future of mobility?, Wolfgang Heinz, University of Applied Sciences Würzburg-Schweinfurt, Germany
- Implementing a Local Grid-based System applied on E-Commerce web crawling, Elena Hinoveanu, University of Craiova, Romania
- Application of component-oriented programming and MVC pattern in development of orthopedic salon information system, Andrey Kabanov, Alexey Churkin, Department of Applied Informatics in Economics, Russia

"IMAGINATION, CREATIVITY, DESIGN, DEVELOPMENT" Sibiu, May 17-19, 2018

$13^{50} - 15^{00}$ Lunch – University canteen

$15^{00} - 16^{20}$ Papers presentation – Chair Prof. Dr. Peter Braun

- Smart Parking Solution, Vadim Fîntînari, Zoltan Gyulai-Nagy, Transilvania University of Brașov, Romania
- *Treasureland 2D platform game*, **Iskren Ivanov**, University of Ruse, Bulgaria
- An efficient FPGA implementation of a deep learning approach for the classiffication of saccadic movements in clinical electro-oculography, Carlos Cano-Domingo, University of Málaga, Spain
- *Modeling of a life cycle of innovation project,* **Asaf Ali Khan**, Siena State University, Italy

$16^{20} - 16^{30}$ Coffee break

16³⁰ – 18¹⁰ Papers presentation – Chair Assoc. Prof. Laura Stoica

- Decompression Algorithms RGBM and VPM, a comparative approach, Alexandru Crăciun, "Iuliu Hațeganu" University of Medicine and Pharmacy of Cluj-Napoca, Romania
- *Eco-Educational Game: Wedoo*, **Mihai Sandu**, University of Craiova, Romania
- *Rigid image registration framework based on grid search*, **Ira Tuba**, **Milan III Tuba**, **Una Tuba**, Singidunum University, Serbia
- 2D Videogame,turn based strategy in Unity, Mihail Juravlea, "Lucian Blaga" University of Sibiu, Romania
- Chat bot series for exam preparation, **Dmytro Khapilin**, **Artem Sierikov**, **Dmytro Veretelnyk**, Simon Kuznets Kharkiv National University of Economics International Economics and Kharkiv National University of Radioelectronics, Ukraine

18¹⁰ – 19⁰⁰ **Pizza break**

19⁰⁰ Social program:

Sibiu by night. Visit of the old city center

Sibiu Jazz Festival. Sibiu Big Square. http://sibiujazz.ro/ro/program/

"IMAGINATION, CREATIVITY, DESIGN, DEVELOPMENT" Sibiu, May 17-19, 2018

FRIDAY, May 18, 2018

Faculty of Sciences, Sibiu, Dr. I. Rațiu st., No. 5-7 1st Floor, Room A18

9⁰⁰ – 10⁰⁰ **Papers presentation – Chair Lecturer Dr. Daniel Hunyadi**

- Framework for medical digital image enchantment, Una Tuba, Ira Tuba, Milan III Tuba, Singidunum University, Serbia
- *Emergency Situations*, **Nicolae Lungu**, "Lucian Blaga" University of Sibiu, Romania
- A generic Scratch interpreter for embedded systems, Alexander M. Frühwald, University of Applied Sciences Wuerzburg-Schweinfurt, Germany
- $10^{00} 10^{20}$ IT companies presentations (NTT Data)
- $10^{20} 10^{40}$ Coffee break

10⁴⁰ – 12⁰⁰ **Papers presentation – Chair Prof. Dr. Arndt Balzer**

- AI application using Mindstorms robot, Andrei Vass, Stefan Bereghici, Technical University of Cluj-Napoca - North University Center of Baia Mare, Romania
- Food Ordering System, Darius Hațegan, "Lucian Blaga" University of Sibiu, Romania
- Prediction of project task execution time by clustering and classification methods, Nataliya Bobrovskaya, Moscow Institute of Physics and Technology, Russia
- *The Pictures of Chaos*, Eduard Traian Ștefănescu, Anastasia Tica, Marek Pruteanu-Popescu, "Lucian Blaga" University of Sibiu, Romania

$12^{00} - 12^{20}$ Coffee break

12²⁰ – 14⁰⁰ **Papers presentation – Chair Prof. dr. Dana Simian**

- *Bypassing Antiviruses in 2018*, **Svetoslav Hadziivanov**, University of Ruse, Bulgaria
- Digital interactions based on brainwaves signals, Robert Săndică, Petrică Bota, "Lucian Blaga" University of Sibiu, Romania
- Information Security Awareness: It's Time to ChangeMinds!, Andreas E. Schütz, University of Applied Sciences Würzburg-Schweinfurt, Germany
- Cyber Security: strategic people risk management, Eugen Cojocaru GSD, Romania

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- Medical Image Classiffication Based on Pixel Intensity Features, Bogdan Dumitru Mateis Boruz, University of Craiova, Romania
- 14⁰⁰-15³⁰ Lunch University canteen
- 16⁴⁵ 17¹⁵ **Official closing and awards ceremony -** Faculty of Sciences, A18 Room
 - 17⁴⁵ Official conference dinner University canteen

SATURDAY, May 27, 2017

- 8⁰⁰ 20⁰⁰ **Trip on the route** Sibiu Fagaraş Bran Castle (Dracula`s Castle) The Rupestra Monastery Şinca Veche
- 20⁰⁰ 23⁰⁰ Social program:

Sibiu Light Festival (Sub Arini Park) http://sibiunews.net/articole/21-special/18789-festivalul-luminii-la-sibiu.html

Sibiu Jazz Festival. Sibiu Big Square. http://sibiujazz.ro/ro/program/

"IMAGINATION, CREATIVITY, DESIGN, DEVELOPMENT" Sibiu, May 17-19, 2018

ABSTRACTS

Automated Car Parking System

Andrei-Timotei ARDELEAN, Marius CIOCAN

In order to explore the problem of creating a vehicle that handles parking in a fully autonomous manner a virtual simulation was created. In this paper is described a model that successfully learns to control the car from realistic sensory input using a state-of-the-art reinforcement learning algorithm. Considering real inputs can be easily mapped to simulation values and the environment mechanics can be adapted to match real car controls the results can be reproduced and used on a physical object. In our approach, a neural network is used to compute the preferred action at each step, the actions that will safely get the car to the parking spot. By performing a large number of parking attempts the network trains and learns how to act. Eventually, the agent accurately controls the car and can even exceed human performance in the environment.

Smart app for your smart home

Maria Alexandra BĂILĂ

Living today in a world where technologies evolves fast, Internet of Things applications established as an easily accessible way to control house environments in order to ease up living, reduce costs and to offer access from anywhere in world. This paper presents a method of acquiring environmental date by several remote sensors and brings data visualization as web service together with strategies for taking action in specific situations. The target is to be able to automatically interpret occurred events and dynamically extrapolate possible events to be happening. Consequently, the application described here is intended to be used as a smart interface for a smart home.

Prediction of project task execution time by clustering and classification methods

Nataliya BOBROVSKAYA

This article examines execution time prediction and Story Points evaluation on the basis of numerical and text attributes. To assess the significance of words in the set, the metric Tf-idf was used. Clusters of tasks in terms of task execution time and Story Points are determined using the T-SNE algorithm. To classify Story Points the logistic regression algorithm was used.

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Medical Image Classiffication Based on Pixel Intensity Features

Bogdan Dumitru Mateis BORUZ

The current work outlines a computer assisted diagnosis for cancer by analyzing histopathological images. The procedure identifies light components in each slide and creates basic morphological features and statistics related to them. The obtained numerical dataset is given to machine learning classifiers in order to find the relation between the values for the attributes and their classes. Three different such classifiers are tried and two of them reach accuracy values similar to more complex methodologies, showing potential for further study.

Autonomous navigation system based on data acquisition

Constantin Robert CIOLOMPU

Our modern society faces an increasing need for dealing with automation of the surrounding environment, due to a variety of benefits brought to human's professional and personal domain. This article contributes to such effort by presenting a control system of an autonomously exploring robot based on several data acquisition techniques. The data acquired from different hardware components are processed and interpreted in order to obtain an intelligent autonomous working machine with features building upon environment recognition or fault detection. The targeted control system is intended to prove useful in various situations, from industrial purposes to daily needs of the common man.

Cyber Security: strategic people risk management

Eugen COJOCARU

"Companies spend millions of dollars on firewalls, encryption, and secure access devices, and it's money wasted, because none of these measures address the weakest link in the security chain." - Kevin Mitnick.

We live in a digital world, surrounded by technology and electronic notices at every step. In such environment, where the things around us continue to get smarter, faster, more connected, and increasingly digital, the protection of information assets gets vital to every individual, community, private business and public organization. This paper focuses on people risk management process, in cyber security context, as part of a complex system of interrelated elements and demonstrates the importance of human factors behind cyberattacks and risks, as these are the biggest trigger of cybersecurity incidents.

Cyber Security gained a significant increase in interest due to the threats coming from the cyber crime. Companies spend millions of dollars to protect themselves and their users against fast evolving threats, while managing cybersecurity has more and more challenges due to the worldwide skills shortage and the increasing sophistication of cyber criminals.

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At first glance, cyber security is addressed as being all about technology (software systems and hardware solutions). Of course, cybersecurity relies on technical elements and technology is crucial to address cybersecurity challenges because products like firewalls, antivirus systems or secure access devices are needed to prevent attackers from achieving their goals.

However, it is equally important to analyze and understand the role played by the human factors in cybersecurity context. People frequently miss-consider security risk as being primarily a technology risk, but it's just as much a cultural risk. It is a matter of education and attitude. We need to make sure that our culture understands security to a certain extent and implements the right approach towards it, focusing on strategies of managing cybersecurity people risks.

Decompression Algorithms – RGBM and VPM, a comparative approach

Alexandru CRĂCIUN

Modern hyperbaric diving theory has evolved much since the invention of high performing computation machines and the rapid miniaturization of technology. The last decades of the 20th century proved to be a turning point in the understanding of hyperbaric physiology and the mechanisms of organic decompression, this field of study providing a great opportunity for physicians, mathematicians and engineers alike to develop mathematical models for decompression prediction following standardized algorithms. This current document aims to delve into the fascinating field of diving theory, by allowing a concise comparison between two of the most acknowledged and preferred dive-prediction and planning algorithms in usage by commercial, military and recreational divers: Suunto Fused RGBM and HHS VPM-B. By the use of 5 theoretical diving scenarios (further expanded into 2 sub-scenarios, by considering different equipment parameters), the algorithm's results are being compared and contrasted, allowing the reader to form a rather broad image on the algorithm's capacities and possible shortcomings, emphasizing on the different approaches towards diving practice that the models suggest when using them as a sole mean to predict a dive's outcome.

Services marketplace web app

Gheorghe-Cătălin CRIŞAN

The goal of this article is to propose and present a web application that aims to help peoples to find local professionals or craftsmen to solve their day-by-day problems. Based on two-sided marketplace concept, the application brings together customers and service providers making easier and faster for peoples to search experts near their location and match the best one comparing their rating and reviews. The app also, helps freelancers and local businesses (large and small) to grow and find new customers.

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By using two-sided marketplace concept, communities get self-balancing by lowering the unemployment rate and growing their economy. Adopting freemium pricing strategy, service providers can increase customer retention rate by promoting their services on top of search results. Another goal of this paper is to present the architecture and functionalities of this application based on MEAN stack: a powerful open-source JavaScript software stack that help to build scalable solutions by using single language development for back end and front end – flexible, faster and reusable.

An efficient FPGA implementation of a deep learning approach for the classiffication of saccadic movements in clinical electrooculography

Carlos Cano-DOMINGO

This work presents a hardware implementation of a Convolutional Neural Network (CNN) on a Field Programmable Gate Array (FPGA) device. The particular implemented CNN is devoted to classify in Healthy, Presymptomatic and Sick subjects with respect to the Spino Cerebellar Ataxia type 2 (SCA 2) disease by using saccadic patterns as inputs. Our main objective is to study the viability of implementing this kind of deep neural networks on a low cost FPGA device and its competitiveness versus classical personal computers. To this end, we have firstly implemented our CNN model in Keras, a high level language oriented to software implementation on PC or GPU; then we have implemented it again in Matlab, in order to directly evaluate the different mathematical operations involved in it; finally, it has been implemented on a low cost Zynq 7000 FPGA model using a High Level Synthesis Language (HLS), which drastically reduces the design time and optimizes the use of components in the FPGA. The result report about the hardware implementation offers a reduction in processing times between 8 and 12 times regarding software solutions on PC. Respecting to the used resources, it has required a 78% of the total available Digital Signal Processors (DSP), the memory is mostly implemented in LUT and the total used LUT is around a 60% of the total.

These indicators make promising the FPGA based implementation of CNN models versus traditional software based implementations running on a current Hospital's computer.

Smart Parking Solution

Vadim FÎNTÎNARI, Zoltan GYULAI-NAGY

A "plug and play" solution for managing parking spaces. Based on Convolutional Neural Networks and Machine Learning algorithms that compute human driving behavior. The system generates a local topography as it learns the parameters of the parking lot (number of parking spaces, position). Then it will provide real-time information, detecting stationary vehicles, for a user-friendly interaction.

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A generic Scratch interpreter for embedded systems

Alexander M. FRÜHWALD

This paper describes the design and development of a generic Scratch interpreter for use with embedded systems. As an example the usage with controllers made by Fischertechenik is shown. This software can be used to easily extend existing software to allow any user to manipulate and control it using the visual programming language Scratch. The particularity of this piece of software is that it is easy to be integrated and optimized for the usage on embedded systems, so it has a minimal footprint and a very low memory usage.

Bypassing Antiviruses in 2018

Svetoslav HADZIIVANOV

Many popular Antivirus (AV) solutions claim to be effective against unknown malware which is wrong. This paper presents various techniques used by malware developers to evade detections as like as a protection from it. It comes that some AV solutions have better methods to detect x86 malware than others but when it comes to x64 malware, they are all way behind the truth.

Food Ordering System

Darius HAŢEGAN

Applications used to order food exist on the market, but most of them are made to help customers, rarely to help the provider to improve the order management system. The aim of this paper is to study many applications used for food ordering and to design and implement a new android app which helps customers to order food from a specific brand and to optimize providers order management.

We name our application Food Ordering System. Our application is focused on provider needs but also on helping user to create complex customized orders in an optimized way. We have made research on 12 apps and we have combined features from each one in order to create a complex, useful application for both user and provider. A lot of existing applications are oriented only to the user, and not enough to the business. One example of application is "McDonald's app" which offers information about food menu or nutrition. We have selected a good feature from this application, the location one, which helps the user to find the location of a specific restaurant or to navigate to the location. Another application was "EuCeMananc" which provides the possibility to order from many restaurants from different cities. This application does not offer an option for order customization and usually requires a phone call from the provider for order validation. To the best of our knowledge, there are noapplications which promotes the providers and allow the optimization of the order management system.

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In the first release, we will have one application for customers, another one for providers (restaurants) and one server which is the bridge between clients.

Our proposed application allows customers to personalize in detail the food products by choosing all the ingredients and also offer the possibility of tracking in real-time status of the order. The user will know when the food ordered is ready through notifications. The notifications are another feature not found in others applications. The provider web app has two level of users, admin and employee. Our application is already in the development stage for a national company which has 21 fast-foods in Romania and Hungary. Our apps, Food Ordering System, have a great future ahead, being implemented by a fast-food chain.

Secret synergy effects from physics and predictive analytics - The future of mobility?

Wolfgang HEINZ

All kinds of driving assistance systems are used by present-day cars to support drivers. Innovations in engineering and a rising environmental awareness led to safer, more efficient and more economic cars in the field of individual traffic. Information technology developed besides the classical automotive engineering and now, cars finally consist of engineering as well as information systems. This paper aims to discover the potential of physics and predictive analytics to reduce fuel consumption and emissions. So this paper tries to answer the question if it is possible to increase the efficiency of traffic through the interconnection between classical physics and modern information technology. First, due to the complexity of the subject, the mathematical basics have to be designed and documented with a special focus on driving dynamics and resistance. A formula for driving economics has been setup and the algorithm was tested and transferred into a data model. The model was built of individually collected and digitalised data. The gradient data of the track was raised in cooperation with the local freeway department. Finally different model based tests were performed and documented. To support the findings, an expert was asked for his professional and personal evaluation Findings. Different simulations on the said model were showing a decrease in fuel consumption of 1.4% on average. The model is of course unable to contain every aspect of a areal scenario. Traffic congestion of construction sites at the autobahn were not considered.

Affinity Propagation as an algorithm for segmentation problems in business intelligence

Moritz HEUSINGER

Affinity propagation (AP) is a modern clustering algorithm proposed by Frey & Dueck with a wide application range due to often superior results, compared to classical approaches like k-means. AP is based on a probabilistic graph modeling, with an underlying message passing approach, where the number of clusters evolves during the propagation procedure and has not to be defined in advance.

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The paper provides a comparative analysis of AP in the field of business intelligence, with respect to standard methods like k-means and hierarchical clustering.

Implementing a Local Grid-based System applied on E-Commerce web crawling

Elena HINOVEANU

This paper presents the configuration process and challenges encountered in setting up a local low powered grid system for the purpose of crawling E-commerce websites. We will configure a local LAN network to support the communication between nodes and the main grid control centre. Multiple computing nodes with low hardware specifications are used collectively via low spec open source applications. Management engines provide a wide variety of alternatives to manual system monitoring. Sacrifice of automatic control leads to functionality deprivation and eventual inefficiency. Therefore, we will be using Puppet for secure information flow inside the structure. The cost of less control over system components as well as less functional options is balanced with the ability of using all resources simultaneously. Our efforts will show noteworthy results in the pursuit of a web crawler implementation designed to scrape products on distinct E-commerce websites, to parse their content in accordance to well-determined patterns and lastly notify users over available sale offers and their prices within the system. The overall structure demonstrates extensibility towards future demands and indicates an initiation in further similar operations. A future prospect for this project is the utilization of Hadoop within the cluster for big volumes of information to be downloaded, stored and processed accordingly.

Treasureland – 2D platform game

Iskren IVANOV

Treasureland is a single player 2D platform game. It is based on Unity Engine using C#. Everyone likes playing games in the free time. The games are a good way to relieve stress or just to play them for fun. Treasureland is generally made for children but adults can also play it as well.

2D Videogame, turn based strategy in Unity

Mihail JURAVLEA

Different types of computer games, like action, strategy or adventure are consider really challenging for the human brain. The aim of the present article is to propose and describe a new strategy game named "Climate war". The game involves strategically decisions, attention, resources management,

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scheduling skills, objects management and learning skills about geography and fauna of the world. As "Climate War" is a strategy turn based game, it offers a real map of the world, the possibility of creating populations and to manage their resources. Among the important technical features of this game are: saving progress capabilities and low memory and CPU overhead, thanks to Unity game engine.

Application of component-oriented programming and MVC pattern in development of orthopedic salon information system

Andrey KABANOV, Alexey CHURKIN

This article discusses the use of component-oriented programming and mvc pattern in the framework of .NET technology in the development of the information system of the orthopedic salon. Features of the component approach and mvc pattern in solving authorization tasks, organizing access to databases, managing screen forms and displaying information on screen forms and web application pages are analyzed.

Modeling of a life cycle of innovation project

Asaf Ali KHAN

In this article a life cycle of innovation project was described and studied. Types of innovations were classified and discussed. Modeling of a life cycle of innovation project was made on the basis of the carried-out analysis. Modeling was made with the help of the Business Studio program in IDEF0 (Integration Definition for Function Modeling) notation. The paper illustrates advantages and disadvantages of business process modeling.

Chat bot series for exam preparation

Dmytro KHAPILIN, Artem SIERIKOV, Dmytro VERETELNYK

The purpose of the work is to create a series of chat-bots for a very popular messanger among students - Telegram. Our series of bots for help in preparing for external independent evaluation (tests you take before applying to ukrainian university after the school) works as follows. In a working prototype of logic design, we have focused on a convenient and intuitive interface that is as close as possible to the current exam format. Particularly this chat will become a place with of which a future series of bots will conduct a dialogue with the user. In different series, we have a variety of variations of the types and task modules that were removed and separated from the past

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years tests. This product has many positive aspects. Firstly, this is not a separate application that takes place in the device memory, but a special bots for the existing Telegram messenger, which will be able to help schoolchildren and students in preparation through the simple and easy-to-use chat environment for them. This is due to the fact that this application already has a huge audience, which from the very beginning will become our audience. Secondly, users don't have to download individual applications to their phone, that is, they do not use separate storage on the device. Thirdly, it's easier for users to share a series of bots than an application for a mobile device. They simply send their friends a link to a series of bots, after which users go tothe chat window with it. A series of chat bots is a universal assistant for any student. Almost half of the project has been implemented, and its subsequent implementation is planned on the western markets.

Termohub – IoT web service

Borislav KOSHAROV

Termohub is a web application for managing internet of things devices, storing data from their sensors and displaying charts with the collected data.

Emergency Situations

Nicolae LUNGU

Every time a patient goes to a doctor he needs to carry with him all his medical records, or at least a big part of them, but he doesn't have all of them somewhere centralized, and in case of need he or a specialized doctor can't access them all together fast.

"Emergency Situations" is a web application designed to help patients and doctors to gain a stronger collaboration in case of emergency situations, and the main purpose of this application is to identify a patient based on his fingerprint.So in case of an emergency situation, when the life of the patient depends on those few minutes and the doctor has no idea what is happening with the patient, by scanning his fingerprint the doctor will gain access to the patient personal medical data and will be able to see what kind of allergies , diseases , surgeries , implants the patient has and will be able to take fast and precise measures avoiding the routine checks which can cost the patient life.

Online Rendering Tools and Design in Blender

Alexandru PINTEA

The paper presents a 3D project made in Blender with the technical, industrial design facility. The created object is included in a newly created website that allows interfacing with the rendering, viewing and online collection of 3D models. 3D modeling is achieved today with many software

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technologies, including Blender. Online rendering allows images to be of high quality regardless of the graphics performance of the user's computer. Users could interact in real-time with the 3D model.

FRELaw Dictionary - a Trilingual Glossary of Law Terms

Mihai SANDU

This article describes the elaboration of the trilingual French-Romanian-English dictionary of legal terms (source language: French). The dictionary aims at filling a gap in the landscape of available specialised dictionaries, targeting this three-language combination for the very first time, to the best of our knowledge. The electronic resource we intend to build will be used for a wide range of target groups:

(a) translators - who will use it as a working tool;

(b) linguists - disambiguation studies, development of automated translation software, linguistic studies for French, Romanian and English language;

(c) legal experts - terms are carefully classified according to their various meanings;

(d) students from different study areas: law, translation and philology - as a study device.

The dictionary was created in accordance with the best practices regarding the construction of electronic databases and the suitable structuring of terminological records. To this purpose, a framework was deployed so that the information required for the terminological sheets would be collected (electronic dictionaries, specialised e-catalogues, etc.) by qualified individuals. The goal is to provide content with a high degree of expertise, as well as ensure the required dimensions so that the dictionary may become a benchmark in the legal field.

Digital interactions based on brainwaves signals

Robert SĂNDICĂ, Petrică BOTA

Ever since their invention computer processing power has increased dramatically with each passing year. The processing power of a regular computer is much greater than it was 20 years ago but the capabilities of the person that interacts with the computer are relatively the same as they were 20 years ago. We as users are still limited to pushing buttons, scrolling or touching screens in order to communicate with the computer. The aim of this article is to propose a new solution to the issue of data input. We consider that by using a neural reader that directly reads the user brainwaves we are able to drastically reduce the time required to input commands into the computer. This could be of help especially to users with limited range of movement. As proof of concept we created an application that reads and interprets the user's brainwaves in order to complete certain actions. We have found that it is possible to transform the user's brainwaves into digital signals that can operate real devices.

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Information Security Awareness: It's Time to ChangeMinds!

Andreas E. SCHÜTZ

In the age of digitization, the importance of information and information technology and thus of information security is increasing. Employees get more and more targeted by attackers and therefore need to be fully informed about their role for securing a company's information assets. Measures for raising the security awareness are often limited to informing employees about compliant behavior towards information security. However, employees must also be motivated to apply this knowledge to their situation and must be able to do so. The Integrated Behavior Model from the field of social psychology explains which factors cause a person to show a certain behavior. In addition to knowledge, these factors are, for example, intention, habit and environmental constraints. This paper applies the Integrated Behavior Model to the context of information security. It shows the complex interplay of several factors that determines an employee's compliant behavior and how companies can specifically target individual factors. With that, companies are empowered to actually sensitize their employees to information security rather than just conveying knowledge.\

The Pictures of Chaos

Eduard Traian ȘTEFĂNESCU, Anastasia TICA, Marek PRUTEANU-POPESCU

Our application is about fractals. It is fascinated how fractals interact with the real world. They are incredible, and the closer you look at them, the more fascinated you become with their ability to morph into different shapes.

We want to build an Windows Form application written in C#, in which every user can play with different fractals. We imagine it something like this: every user can choose a fractal from a list, in order to manage different properties. The user could increase or decrease the iterations, change the color, the angle, the coordinates, where the fractal will be drawn and he can combine two or more fractals in the drawing place.

Rigid image registration framework based on grid search

Ira TUBA, Milan III TUBA, Una TUBA

Image registration represent an important problem that refers to image alignment. It is used in many applications and in various scientific fields such as astronomy, medicine, robotics, and others. Due to the wide use, it is an important and common research topic. Two images can be aligned by linear (rigid) of non-linear transformation. In this paper rigid image registration problem was considered. In order to find transformation parameters, grid search method was implemented. Framework for digital image registration include image preparation and performing grid search for finding the optimal parameters.

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Framework for medical digital image enchantment

Una TUBA, Ira TUBA, Milan III TUBA

Digital images are used in numerous areas and medicine is one of them. Medical digital images and their analysis represent rather important part of diagnostic process. Computer aided diagnostic is active research topic and the first step in these methods is image improvements for the certain task such as tumor or cancer detection, bleeding detection, etc. Depending on the task, different preprocessing steps are necessary, e.g. edge detection, contrast improvements, segmentation and others. In this paper a framework for medical image enhancements is proposed. The proposed framework consists of the several most used algorithms for preprocessing medical digital images. The used algorithms were made to be flexible but yet simple to use. It was enabled to manipulate with several parameters for each algorithm thus it can be used for different medical images such as MRI, X-ray images, ultrasound images and others.

AI application using Mindstorms robot

Andrei VASS, Stefan BEREGHICI

Using a Mindstorms robot and AI libraries, we teach the robot to answer question, and respond properly, also following the beacon he learns not to trespass the lines draw by us. We approach robotics, to become familiar with the nature of robotics AI using the Lego Mindstorms robot. We integrated in our project several AI libraries and also train the robot to not pass the lines we draw.

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	Smart Parking Solution	
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5	Ralf Fabian, "Lucian Blaga" University of Sibiu, Romania	
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Map of Sibiu – Conference venue



Open Air Museum - Astra

Location

1. Rectorat

- 2. Faculty of Science
- 3. Academic Reunion Center
- 4. University Canteen
- 5. Pedestrian street, Big square
- 6. Open Air Museum

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