"Lucian Blaga" University of Sibiu
Faculty of Sciences

International Conference on Applied Informatics

„IMAGINATION, CREATIVITY, DESIGN, DEVELOPMENT"

Program & Abstracts

SIBIU, ROMANIA
May 25-27, 2017

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

OBJECTIVES

The conference is mainly addressed to bachelor and master level students, PhD 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.

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  "Lucian Blaga" University of Sibiu,Romania
  E-mail: dana.simian@ulbsibiu.ro, d_simian@yahoo.com

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- Prof. PhD. Milan Tuba - Megatrend University of Belgrade, Serbia

- Lecturer PhD. Anca Vasilescu - Transilvania University of Brasov, Romania

- Lecturer PhD. Laura Florentina Stoica - "Lucian Blaga" University of Sibiu, Romania

Organized by:

Research Center in Informatics and Information Technology

Department of Mathematics and Informatics

Faculty of Sciences

"Lucian Blaga" University of Sibiu

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O U T L I N E   P R O G R A M

THURSDAY, May 25, 2017

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

8^{30} – 9^{30} **Registration**

9^{30} – 9^{45} **Opening ceremony**

9^{45} – 10^{20} **IT companies presentations (ProIT, AUSY Technologies)**

10^{20} – 11^{20} **Papers presentation – Chair Prof. dr. Dana Simian**

11^{20}– 11^{40} **Coffee break**

11^{40} – 12^{40} **Papers presentation – Chair Prof. dr. Milan Tuba**

12^{40} – 14^{40} **Lunch – University canteen**

14^{40} – 15^{40} **Papers presentation – Chair Lecturer dr. Mircea Neamtu**

15^{40} – 16^{00} **Coffee break**

16^{00} – 17^{00} **Papers presentation – Chair Assoc. Prof. dr. Florin Stoica**

18^{30} **Social program (Sibiu by night. Visit of the old city center)**

FRIDAY, May 26, 2017

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

9^{10} – 9^{20} **IT companies presentations (Ropardo)**

9^{20} – 11^{00} **Papers presentation – Chair Prof. dr. Katalina Grigorova**

$11^{00} – 11^{20}$ **Coffee break**

$11^{20} – 13^{00}$ **Papers presentation – Chair Prof. dr. Dana Simian**

13^{00}-15^{00} **Lunch – University canteen**

$16^{15} – 17^{00}$ **Official closing and awards ceremony -** Faculty of Sciences, A18 Room

17^{15} **Official conference dinner - University canteen**

SATURDAY, May 27, 2017

10^{00} - 13^{00} **Social program** (Visit of ASTRA Museum, historic center, other museums)

P R O G R A M

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- *Secured Bootloader: application for initializing and updating microcontroller applications*, **Barbu Paul – Gheorghe**
  "Lucian Blaga" University of Sibiu, Romania
- *The Weather Stylist App*, **Gheorghe – Cătălin Crişan**
  "Lucian Blaga" University of Sibiu, Romania
- *Art School "Art Popovo" – Web Application*, **Svetoslav Hadziivanov**
  University of Ruse, Bulgaria

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11^{40} – 12^{40} **Papers presentation – Chair Prof. dr. Milan Tuba**

- *Automatization of the process of bibliography making for article-level metadata,* **Dorina Luca**
  Institute of Mathematics and Computer Science of The Academy of Sciences of Moldova, Republic of Moldova
- *RS.TeamNotifier*, **István Bialkó**
  Spiru Haret University, Bucharest, Romania
- *Virtual Pathfinder*, **Săndică Robert, Bota Petrică**
  "Lucian Blaga" University of Sibiu, Romania

12^{40} – 14^{40} **Lunch – University canteen**

14^{40} – 15^{40} **Papers presentation – Chair Lecturer dr. Mircea Neamtu**

- *Devising an improved UniversityManagement System,* **Elian Doran, Alex Negru**
  "Lucian Blaga" University of Sibiu, Romania

- *Game Boy Emulator,* **Borislav Kosharov**
  University of Ruse, Bulgaria
- *TestIT*, **Florea Adrian-Cristian**
  "Samuel von Brukenthal" National College of Sibiu, Romania

$15^{40} – 16^{00}$ **Coffee break**

$16^{00} – 17^{00}$ **Papers presentation – Chair Assoc. Prof. dr. Florin Stoica**

- *ADiagnostic*, **Iulia Georgiana Rînea**
  "Samuel von Brukenthal" National College of Sibiu, Romania
- *Eco-Educational Game: Wedoo*, **Cristian-Ionuț Cazan, Ionuț Stelian Nicoară, Monica-Andreea Ionescu**
  Petroleum-Gas University of Ploieşti, Romania
- *Interregional logistic management of transport system on the basis of the fuzzy relations of preference*, **Maria Sokolova**
  Vladimir State University, Russia

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- *Framework for testing discrete cosine transform*, **Una Tuba, Ira Tuba**
  John Naisbitt University, Serbia
- *Student Share - MEAN application*, **Hodină Dragoş, Hodină Ionuț**
  "Lucian Blaga" University of Sibiu, Romania
- *S.O.S. Cardio*, **Holerga Flavius Adrian**
  Theoretical Highschool "Axente Sever" of Medias, Romania
- *Framework for Segmentation of Digital Images*, **Aleksandar Stojak, Eva Tuba, Milan Tuba III**
  John Naisbitt University, Serbia
- *PROSERPINA - The godness of the underworld*, **Cristiana Constantinescu**
  University of Craiova, Romania

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- *iClock PRO - the best timepiece for mac*, **Viorel Cornel Porumbescu**
  University of Craiova, Romania
- *SmartViewReward*, **Ioana Teodora Duma**
  Babes-Bolyai University of Cluj-Napoca, Romania
- *System of assigning tasks*, **Daniel Valentin Ferecatu**,
  University of Craiova, Romania
- *Life of a Kutit*, **Andrei Muresan**
  Babes-Bolyai University of Cluj-Napoca, Romania
- *Making Animations in Blender*, **Alexandru Pintea**
  National College E. Racoviță of Cluj-Napoca, Romania

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A B S T R A C T S

Secured Bootloader: application for initializing and updating microcontroller applications

Paul – Gheorghe BARBU

This paper aims to create a bootloader for embedded devices. The purpose of the bootloader is to be the first to run when the microcontroller starts and to provide a way of controlling what application runs next, similarly to how bootloaders work on the desktop systems. The difference here being that the bootloader's purpose is to allow the embedded device to be much more flexible, since the application running on the microcontroller can be changed without using specialized hardware. This flexibility and the fact that no specialized hardware programmers are needed also leads to a reduction of costs for deploying and maintaining the embedded systems. These two goals, flexibility and cost reduction must be accompanied by a third one: security. The recent growth of embedded systems in the IoT (Internet of Things) domain demands that the device deployed be more secure than in the past.

RS.TeamNotifier

István BIALKÓ

This software offers an easy to use, easy to deploy solution to teams formed for university projects, small companies, or even bigger companies with many teams that need to communicate on a regular basis. It is a sever-client based setup, using separate channels and Toast notifications for Windows 10.

Eco-Educational Game: Wedoo

Cristian-Ionuț CAZAN, Ionuț Stelian NICOARĂ, Monica-Andreea IONESCU

One of the most burning issues of our current generation is the environmental pollution. During past years, people have been just throwing things away, having no concern whatsoever about where they might end. Studies that are more recent have shown that we produce far more waste than our planet can take. This paper presents an eco-educational game, Wedoo, which aims to increase the people's awareness related to the world pollution issue. The paper also demonstrates how its game engine, especially created for the Wedoo game itself, was continuously refined and still improving so that other new games can use it during their development process.

PROSERPINA - THE GODNESS OF THE UNDERWORLD

Cristiana CONSTANTINESCU

Steganographic concepts have constantly evolved during the centuries, from the early and famous example of Histiaeus' plain sight hiding messenger, to advanced cybernetic algorithms designed to be computed on high performance platforms in order to provide trusted steganographic solutions. Associety finds itself in a constant evolution loop, so does the need of advanced steganographic implementations and the requirement of higher and higher levels of protection against any potential 'Eve'. For this need to be adequately fed and for the large public to be allowed to have access to the new implemented solutions, we propose a modern steganographic solution with original contributions in improved security, execution time and on-line sharing tehniques. In this paper we will describe the overall features of the proposed solution and will analyze some of the gratest bene_ts this solution brings to the public. The proposed solution was developed with the great help of Univ. Conf. dr. NicolaeConstantinescu, in the heart of M.A.N.A. Research Laboratory.

The Weather Stylist App

Gheorghe – Cătălin CRIȘAN

The article present a web application that aims to solve everyday problems related to clothing to be worn depending on what the weather is like outside. Thus through the application user, one can see the current temperature, and other information about humidity, speed, wind direction and weather forecast for the next three days specifying the minimum and maximum temperature. Another objective is to suggest clothing items considering the external factors of the time. Because today increased emphasis is laid on image, each person who wants to make a position in modern society must adopt appropriate fashion styles also by considering the weather conditions. To use the application at any time of the day and wherever you are it is important to have a cross-platform app, so that the user can access it, for example: in the morning after he wakes up and checks his emails on the mobile or even on a desktop device. Moreover, to help our users, it can also subscribe by setting a time interval, daily or weekly, at which to receive notifications even if the user doesn't use the application. Thus, the user will be constantly updated with the latest news about the weather, but also in terms of clothing recommendations.

Devising an improved University Management System

Elian DORAN, Alex NEGRU

This paper proposes creating a University Management System (UMS) aimed at improving the life of both the university staff and students. A different approach towards unifying actual concepts of UMS with student- oriented software is the core philosophy of the project. The platform being created aims at implementing more unique features when compared to the existing market like Android & iOS apps, cloud integration and a campus navigation system. The final goal is devising an intuitive and elegant solution.

SmartViewReward

Ioana Teodora DUMA

SmartViewReward is a project for mobile devices in Android Studio, created to help children spend less time with their gadgets and learn something every time they use them. The application will lock the smartphone screen and the child can play games or watch videos only if he answers correctly a few questions. The questions for now are about mathematical equations, but in a future version they will be from multiple domains. The application is proposed as a solution to one of the problems of parents in the digital age, namely that children spend too much time on the smartphone and can no longer concentrate with school. In this paper I will present the motivation, the analysis and the implementation of the project.

System of assigning tasks

Daniel FERECATU

This application is the implementation of a system of assigning tasks between users, which uses an authentication and authorization system for data protection. The application is developed using Model-View-Controller pattern, being built on ASP.NET framework.

TestIT

Adrian Cristian FLOREA

TestIT is an application designed for phones with Android operating system, which aims to record the phone's performance, both at the hardware level by recording CPU temperature and battery charging time and at the software level by detecting the copying and creating speed of a file, respectively the download and upload speed of a network. Following these tests, the app

creates various statistics that not only determine the performance of the phone, but can also suggest improvements that can be made to the device's thus preventing a possible replacement with a newer and therefore more expensive model. The application was developed in Android Studio v2.2.3, with tests carried out both through Genymotion emulator and on my mobile phone.

Art School "Art Popovo" – Web Application

Svetoslav HADZIIVANOV

Websites are somehow mandatory nowadays. With the time passing Internet and the technologies are growing very fast. Building a website is not that hard but it takes a while to learn and understand the basics. The paper provides information on why each of us should have a personal website and how is the art school's website build. The realization of some basic features is described. The main tools and techniques for optimization and website security are discussed.

Student Share - A MEAN stack based application

Dragoș HODINĂ, Ionuț HODINĂ

Web applications have developed substantially in last years due to easy scalability, easy access and better business model. Comparing with desktop applications, web applications are less expensive to develop. On a hand, users across the world can access a webpage fast and easily, without installing anything, having possibility to continue their work on a wide range of devices from smartphones to large enterprise screens. On the other hand, companies or web applications owners can easily push updates, target and manage various client needs, have access to data analytics which translates to better products, growing business and happier clients.

The evolving trend of web applications helped web technologies to gain popularity and visibility across developers. As web applications continue to grow in complexity, web programming languages are also growing in terms of features. Here jumps in JavaScript, the "web programming language", which is most used programming language accordingly to largest online developers community (StackOverflow) 2016 survey and is language with most active repositories in GitHub, largest code host service in the world.

S.O.S. Cardio

Flavius Adrian HOLERGA

S.O.S. Cardio is a bracelet designed to detect the pulse of a person with a cardiac condition, who doesn't benefit of permanent medical assistance, but is monitorized by at least another person, be it from the family or from a social program. This device is connected via bluetooth to the user's mobile phone and communicates with it through an app made using „Eclipse" which was created with the aid of the programming language „Java". The application receives the data captured by the proximity sensor from within the bracelet and if the pulse is either too high or too low, a warning message is sent to a phone number which is initially set by the user when the application is first installed on the phone.

Game Boy emulator

Borislav KOSHAROV

Game Boy emulator is a project which purpose is to mimic real hardware with software implementation. It was created to give insight on low-level programming, processor architecture and memory management in a simplified manner. Each hardware module's functions will be described and followed by explanation of it's implementation. Some of the systems are yet to be implemented and are skipped, but are planned to be done in the future.

Automatization of the process of bibliography making for article-level metadata

Dorina LUCA

Nowadays, for greater indexing recognition, scientific journals tend to be present in the most prestigious international databases such as SCOPUS, Thomson Reuters, INSPEC, zbMATH, DOAJ, etc. The goal of this paper is to present the problem of article-level metadata preparation for international databases and the necessity of automatized approach to the process of bibliography making in this framework. A tool that was developed and used already by the Institute of Mathematics and Computer Science of the Academy of Sciences of Moldova is described in the paper. This system helps us to solve the problem of bibliography automatizing when preparing article-level metadata – the process which is necessary if the journal tends to obtain a higher impact factor. The goals of this project are to reduce the preparation time for metadata and to obtain more accurate and complete information about an article.
Keywords: indexing, metadata, impact factor.

Life of a Kutit

Andrei MURESAN

This project is about a game created to make people laugh, but it also has some parts for the people who want to play it more than once. The game titled "Life of a Kutit" was created using Python scripts, and the Pygame module, all written using the Eclipse program. First, the game developing started with the hopes of learning python and game design, and then it became something like a hobby, always wanting to add more items to it, and make it more complex. In the following article I will talk more about the game itself, how it was created, why, and what motivated me.

Making Animations in Blender

Alexandru PINTEA

Computer-generated imagery (CGI) is used nowadays in many fields as medicine, industry, entertainment and education. It is encouraged the development of animation. Animation is frequently used for educational purposes. The paper presents the main steps to create both 2D and 3D animations using Blender. Several original examples are included to illustrate the animation processes.

iClock PRO - the best timepiece for mac

Viorel PORUMBESCU

Starting from mathematical models based on geometry applied on computer science and from a personal observation over the needs of every computer user, I have developed a complex application that implements nonlinear equations and on-screen drawing algorithms and provides accurate interpretation over worldwide time measurements and geographic distances.

ADiagnostic

Iulia Georgiana RÎNEA

The widely dependence on mobility has became nowadays a priority for people. The automotive industry has lately grown impressively a lot. Most of the people give cars an important place in ranking their priorities, and this is the reason of developing an Android application for mobile phone, to help resolve certain car problems, which often occur. This application is divided into three

categories that facilitate the elimination of car damages. The first part is composed of symptoms, which users visual or auditory notice (observing a particular engine noise, unusual smoke detection). This part helps the car owner to repair the vehicle with only basic information in this domain. The second part is composed of a Google Map, which shows all the car services in a specific area. This part of the application is dedicated to serious problems of the vehicle, which can not be detected and which can damage the car. The third part consists of connecting the phone to the onboard computer through a device OBD II ELM-327 Bluetooth that allows certain functions to appear on the mobile screen display (speed, air intake, fuel level). In conclusion, we believe that this application is useful, because it helps to clarify car key issues, contributing in this way also to solving the environmental problems regarding pollution.

Virtual Pathfinder

Robert SĂNDICĂ, Petrică BOTA

The purpose of this article is to demonstrate that augmented reality (AR) can be used in everyday activities to enhance the user's life. Even though there are multiple apps that help and guide the user to reach his desired destination we consider that we can improve the experience. For this purpose we created an AR app, Virtual Pathfinder, that helps the user to reach his destination faster and easier by overlapping virtual cues (that indicate the path to follow) on top of the real world. In order to run the app the user must use a Smartphone with a good Internet connection. We have observed that by using our app users are able to arrive at their destination without making any bad turns during their travel.
Key words: virtual reality, pathfinder, smartphone

Interregional logistic management of transport system on the basis of the fuzzy relations of preference

Maria SOKOLOVA

In this article a variant of a method of a multicriteria alternative choice ELECTRE, which allows to account for uncertainties of expert estimates, was developed and studied. Modified method ELECTRE was tested on a problem solution of logistics management transportation system "point of departure – point of destination". The suggested approach can raise the effectiveness of logistic management of the goods delivery transport system and reduce delivery time.

Framework for Segmentation of Digital Images

Aleksandar STOJAK, Eva TUBA, Milan TUBA III

Digitalization signi_cantly changed everyday life in many aspects, one of which is photography. Digital images are widely used in variety of _elds. There are numerous sources from which a digital image can be produced and also a great number of applications for this type of data. Depending on the purpose of speci_c digital image it is important to clarify and emphasize all valuable data in order of reducing human error in evaluation and interpretation. That is achieved through various image processing methods, one of which is image segmentation. In this paper a framework for image segmentation is being presented. Frameworks scope of work is being tested on several benchmark examples using multilevel threshold with two most successful criterias: Kapur's entropy and Otsu's between-class variance. Framework's utility is presented through comparison of applied methods in terms of execution time, optimal number of threshold and objective function values.

Framework for testing discrete cosine transform

Una TUBA, Ira TUBA

Digital data are part of almost all scientific fields. One of the widely used form of digital data are digital images. Storing and digital image processing represent an important issues that are widely studied. Numerous algorithms and filters based on raw image data manipulation were proposed in the past, but it has been established that manipulation with data in frequency domain is very useful. In order to transform image into frequency domain discrete cosine transform (DCT) is used. In this paper we presented framework for testing and studying behavior of DCT. By applying DCT to digital image area of different sizes and by selecting different number of DCT coefficients quality and the size of the image can be significantly changed. Only few coefficients of appropriate area size are enough to keep visible quality of the image while reducing its size.

LIST OF PAPERS' SUPERVISING PROFESSORS

NO	NAME and AFFILIATION
1	**Grigore Albeanu**, Spiru Haret University, Bucharest, Romania Paper: *RS.TeamNotifier*
2	**Florentin Bota,** Babes-Bolyai University of Cluj-Napoca, Romania Paper: *Life of a Kutit*
3	**Florentin Bota**, Babes-Bolyai University of Cluj-Napoca, Romania Paper: *SmartViewReward*
4	**Vladimir Chernov**, Vladimir State University, Russia Paper: *Interregional logistic management of transport system on the basis of the fuzzy relations of preference*
5	**Svetlana Cojocaru**, Institute of Mathematics and Computer Science, Chisinau, Republic of Moldova Paper: *Automatization of the process of bibliography making for article-level metadata*
6	**Nicolae Constantinescu**, University of Craiova, Romania Paper: *PROSERPINA - The Godness of the Underworld*
7	**Nicolae Constantinescu**, University of Craiova, Romania Paper: *iClock PRO - the best timepiece for mac*
8	**Nicolae Constantinescu**, University of Craiova, Romania Paper: *System of assigning tasks*
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13	**Gabriela Florea**, Theoretical Highschool "Axente Sever" of Medias, Romania Paper: *S.O.S. Cardio*
14	**Katalina Grigorova**, University of Ruse, Bulgaria Paper: *Art School "Art Popovo" – Web Application*
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16	**Gabriela Moise**, Petroleum - Gas University of Ploieşti, Romania Paper: *Eco-Educational Game: Wedoo*
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20	**Laura Stoica**, "Lucian Blaga" University of Sibiu, Romania Paper: *The Weather Stylist App*
21	**Milan Tuba**, John Naisbitt University, Belgrade, Serbia Paper: *Framework for testing discrete cosine transform*
22	**Milan Tuba**, John Naisbitt University, Belgrade, Serbia Paper: *Framework for Segmentation of Digital Images*
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