

Abstracts

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1. Automatic Anthropometric System Development Using Machine Learning

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Abstract

The contactless automatic anthropometric system is proposed for the reconstruction of the 3D-model of the human body using the conventional smartphone. Our approach involves three main steps. The first step is the extraction of 12 anthropological features. Then we determine the most important features. Finally, we employ these features to build the 3D model of the human body and classify them according to gender and the commonly used sizes.

2. The Technological Advent and Dynamics of the Network Society. The "Middle-Aged Approach"

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Abstract

Nowadays, scholars have become interested in the ways new media influence young people, but its influence on middle-aged people have not been thoroughly examined. This age category is often ignored as most of the online activities are performed by young persons. New media gathers a wide range of phenomena which may become concepts of the network society through their diversity, knowledge and novelty. Interactivity is the most important characteristic, turning the user into a content creator, not just into a receiver. Moreover, what was once considered to be a personal state of mind tends to become a part of the public domain. Starting from these premises, the article advances the idea that the Internet can be beneficial not just for teenagers, but also for the middle-aged group oriented towards keeping in touch with relatives and friends and towards finding online useful information. At this level, the present paper aims to discover directions given by network society in the lives of middle-aged people. To this end, the research relies on an interview-based survey which addresses the way people may adapt to communication technology and to its particularities, exploring advantages or discovering potential drawbacks.

3. A Synoptic of Software Implementation for Shift Registers Based on 16th Degree Primitive Polynomials

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Abstract

Almost all of the major applications in the specific Fields of Communication used a well-known device called Linear Feedback Shift Register. Usually LFSR functions in a Galois Field $GF(2^n)$, meaning that all the operations are done with arithmetic modulo n degree Irreducible and especially Primitive Polynomials. Storing data in Galois Fields allows effective and manageable manipulation, mainly in computer cryptographic applications. The analysis of functioning for Primitive Polynomials of 16th degree shows that almost all the obtained results are in the same time distribution.

4. Micro Expression Recognition Using the Eulerian Video Magnification Method

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Abstract

In this paper we propose a new approach for facial micro expressions recognition. For this purpose the Eulerian Video Magnification (EVM) method is used to retrieve the subtle motions of the face. The results of this method are obtained as in the magnified images sequence. In this study the numerical tests are performed on two databases: Spontaneous Micro expression (SMIC) and Category and Sourcing Managers Executive (CASME). We evaluate our proposed method in two phases using the eigenface method. In phase 1 we recognize the type of a micro expression, for example emotional versus unemotional in SMIC database. Phase 2 classifies the recognized micro expression as negative versus positive in SMIC database and happiness versus disgust in CASME database. The results show that the eigenface method by the EVM method for the retrieval of subtle motions of the face increases the performance of micro expression recognition. Moreover, the proposed approach is more accurate and promising than the previous works in micro expressions recognition.

5. The Ambivalence of Strengths and Weaknesses of E-Learning Educational Services

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Abstract

This paper represents a thorough phase in the effort to identify and assort the strengths and weaknesses of e-learning educational services. This paper reviews a synthesis of the assessments on the e-learning educational services through a survey of the specialized literature from 2000 to 2012 in order to identify the strengths and weaknesses of e-learning educational services which were reported during the past decade. The steps of our approach are the following: 1. The identification of a large number of specialized studies that analyze the above mentioned issue; 2. A basic theoretical review of the research from the perspective of identifying the strengths and weaknesses of the e-learning educational services and some of their implications on the intellectual development of the beneficiaries; 3. A descriptive statistical data analysis which is carried out in order to extract information about strengths and weaknesses relevant to the literature taken into consideration; 4. Results classification and interpretation; 5. Formulating practical suggestions for the notion of e-learning educational services considering the development of studies on the impact of their use on the intellectual development of the beneficiaries. The study results highlighted that strengths and weaknesses are not 'pure', but ambivalent, simultaneously incorporating meanings and limits with different weights. A predictive model of future e-learning educational services can be designed on

the basis of the results obtained in the research. This predictive model is based on a pedagogical concept that takes into account the ambivalence of the higher indices which have been identified.

6. New Computer Assisted Diagnostic to Detect Alzheimer Disease

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Abstract

We describe a new Computer Assisted Diagnosis (CAD) to automatically detect Alzheimer Patients (AD), Mild Cognitive Impairment (MCI) and elderly Controls, based on the segmentation and classification of the Hippocampus (H) and Corpus Calosum (CC) from Magnetic Resonance Images (MRI). For the segmentation we used a new method based on a deformable model to extract the area wishes, and then we computed the geometric and texture features. For the classification we proposed a new supervised method. We evaluated the accuracy of our method in a group of 25 patients with AD (age \pm standard-deviation (SD) =70 \pm 6 years), 25 patients with MCI (age \pm SD=65 \pm 8 years) and 25 elderly healthy controls (age \pm SD=60 \pm 8 years). For the AD patients we found an accuracy of the classification of 92%, for the MCI we found 88% and for the elderly patients we found 96%. Overall, we found our method to be 92% accurate. Our method can be a useful tool for diagnosing Alzheimer's Disease in any of these Steps.

7. Participative Teaching with Mobile Devices and Social Networks for K-12 Children

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Abstract

This article details a set of participatory pedagogical experiments conducted within a research grant PN II IDEI ("Time Maps. Real communities, virtual worlds, experimented pasts") performed with the purpose of helping rural communities in identifying their cultural heritage and transmitting it to the younger generations by means of modern IT technologies, including web 2.0. In a Danubian rural community, several points of archaeological interest (POIs) were identified, which were then included in a geographic Augmented Reality application for smartphones and tablets. Subsequently, the geographic data were collected from the archaeological site by the K-12 children, under the coordination of an academic staff member of the National University of Arts in Bucharest, and stored on their devices using Google Maps. The augmented information provided on the site was annotated and shared with other K-12 children, through different social networks sites (SNS) and content postings. This first stage experiment was extended to the development of a social learning environment complementary to the educational site (www.timemaps.net) to support the transmission of several traditional technologies (textile, ceramic, glass) in a collaborative manner. We consider that our experiments can significantly increase the visibility of the information pertaining to the identity of target places and communities among the younger generation. A mobile-learning paradigm, in combination with web 2.0 technologies, was the support for a distributed and low-cost platform for communication and collaboration. Social networks linked the archaeological heritage and the academic research with the larger community of rural K-12 children. The article analyzes this platform as a solution for creating, collecting and sharing educational content, and presents conclusions on using social media for effective blended learning and transmittal of the cultural heritage.

8. Prediction of Thyroid Disease Using Data Mining Techniques

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Abstract

Recently, thyroid diseases are more and more spread worldwide. In Romania, for example, one of eight women suffers from hypothyroidism, hyperthyroidism or thyroid cancer. Various research studies estimate that about 30% of Romanians are diagnosed with endemic goiter. Factors that affect the thyroid function are: stress, infection, trauma, toxins, low-calorie diet, certain medication etc. It is very important to prevent such diseases rather than cure them, because the majority of treatments consist in long term medication or in surgical intervention. The current study refers to thyroid disease classification in two of the most common thyroid dysfunctions (hyperthyroidism and hypothyroidism) among the population. The authors analyzed and compared four classification models: Naive Bayes, Decision Tree, Multilayer Perceptron and Radial Basis Function Network. The results indicate a significant accuracy for all the classification models mentioned above, the best classification rate being that of the Decision Tree model. The data set used to build and to validate the classifier was provided by UCI machine learning repository and by a website with Romanian data. The framework for building and testing the classification models was KNIME Analytics Platform and Weka, two data mining software.

9. An Efficient Combined Meta-Heuristic Algorithm for Solving the Traveling Salesman Problem

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Abstract

The traveling salesman problem (TSP) is one of the most important NP-hard Problems and probably the most famous and extensively studied problem in the field of combinatorial optimization. In this problem, a salesman is required to visit each of n given nodes once and only once, starting from any node and returning to the original place of departure. This paper presents an efficient evolutionary optimization algorithm developed through combining imperialist competitive algorithm and lin-kernighan algorithm called (MICALK) in order to solve the TSP. The MICALK is tested on 44 TSP instances involving from 24 to 1655 nodes from the literature so that 26 best known solutions of the benchmark problem are also found by our algorithm. Furthermore, the performance of MICALK is compared with several metaheuristic algorithms, including GA, BA, IBA, ICA, GSAP, ABO, PSO and BCO on 32 instances from TSPLIB. The results indicate that the MICALK performs well and is quite competitive with the above algorithms.

10. A Repeated Signal Difference for Recognising Patterns

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Abstract

This paper describes a new mechanism that might help with defining pattern sequences, by the fact that it can produce an upper bound on the ensemble value that can persistently oscillate with the actual values produced from each pattern. With every firing event, a node also receives an on/off feedback switch. If the node fires then it sends a feedback result depending on the input signal strength. If the input signal is positive or larger, it can store an 'on' switch feedback for the next iteration. If the signal is negative or smaller it can store an 'off' switch feedback for the next iteration. If the node does not fire, then it does not affect the current feedback situation and receives the switch command produced by the last active pattern event for the same neuron. The upper bound therefore also represents the largest or most enclosing pattern set and the lower value is for the actual set of firing patterns. If the pattern sequence repeats, it will oscillate between the two

values, allowing them to be recognised and measured more easily, over time. Tests show that changing the sequence ordering produces different value sets, which can also be measured.

11. An Energy-Saving Concept of the Smart Building Power Grid with Separated Lines for Standby Devices

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Abstract

Standby power takes 5-10 % of the residential electricity around the world. Some countries lose more than 14 % of the total electricity used in the residential sector. Hence, a new energy-saving concept that could help to decrease the power losses is discussed in this paper. Firstly, the two power lines of infrastructure for continuously connected equipment and for standby devices is proposed for new smart buildings. Secondly, the segmented infrastructure with unified hardware units is proposed for existing smart buildings (the new one can apply this principle as well). The contactors (i.e. unified hardware units) consist of the NodeMcu Lua ESP8266 WiFi IoT development board, ACS712T ELC-30A current sensor, and the SONGLE relay. The automatic mode is based on three steps: measurement of the current using ACS712T ELC-30A sensor in all segments except the root; switching off the relays with the current less than or equal to any number in the historical data; switching off the root contactor if all the descendent relays (i.e. contactors) are switched off. Second step represents the linear classification with sliding window in machine learning. The software consists of two parts, low-level Arduino sketches and high-level C# Windows form app. They are connected by MQTT broker Mosquitto. The proposed concept was successfully tested using a prototype with three segments, one of which includes smart lighting. The payback period is of approximately one month and a half for the whole-building switch concept.

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TABLE OF CONTENTS

1. Automatic Anthropometric System Development Using Machine Learning	5
<i>Long The Nguyen, Huong Thu Nguyen</i>	
2. The Technological Advent and Dynamics of the Network Society. The "Middle-Aged Approach"	16
<i>Elena-Mădălina Vătămănescu, Elena-Alexandra Gorgos, Andreia-Gabriela Andrei, Vlad-Andrei Alexandru</i>	
3. A Synoptic of Software Implementation for Shift Registers Based on 16th Degree Primitive Polynomials	31
<i>Mirella Amelia Mioc</i>	
4. Micro Expression Recognition Using the Eulerian Video Magnification Method	43
<i>Elham Zarezadeh, Mehdi Rezaeian</i>	
5. The Ambivalence of Strengths and Weaknesses of E-Learning Educational Services	55
<i>Venera-Mihaela Cojocariu, Iuliana Lazar, Gabriel Lazar</i>	
6. New Computer Assisted Diagnostic to Detect Alzheimer Disease	75
<i>Ben Rabeh Amira, Benzarti Faouzi, Amiri Hamid, Mouna Ben Djebara</i>	
7. Participative Teaching with Mobile Devices and Social Networks for K-12 Children	94
<i>Livia Ștefan, Dragoș Gheorghiu</i>	
8. Prediction of Thyroid Disease Using Data Mining Techniques	115
<i>Irina Ioniță, Liviu Ioniță</i>	
9. An Efficient Combined Meta-Heuristic Algorithm for Solving the Traveling Salesman Problem	125
<i>Majid Yousefikhoshbakht, Azam Dolatnejad</i>	
10. A Repeated Signal Difference for Recognising Patterns	139
<i>Kieran Greer</i>	
11. An Energy-Saving Concept of the Smart Building Power Grid with Separated Lines for Standby Devices	148
<i>Dmytro Zubov</i>	
Abstracts	157
Instructions for authors	162