Engineering education in a technology-dependent World

BOOK OF ABSTRACTS

March 16 - 19, 2014
Guimarães, Portugal

Edited by
Claudio da Rocha Brito
Melany M. Ciampi

International Council for Engineering and Technology Education

Science and Education Research Council

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Message from the General Chair

As the General Chair I have to say that it is a privilege to chair this prestigious congress that is in its XIII edition and on behalf of COPEC – Science and Education Research Council we are extremely happy once again to welcome all the participants at **INTERTECH'2014 – XIII International Conference on Engineering and Technology Education** another successful scientific event.

The theme of the congress **"Engineering education in a technology-dependent World"** has elicited a wide range of collaborations aiming to encourage the scientific community to keep constant contact with colleagues from other countries and thus to provide a fertile ground for discussions and exchange of experiences so important to the development of science and technology.

This year's exciting program showcases the latest innovations in engineering and technology education with sessions that cover a broad spectrum of topics.

We are very proud to have the congress in such a venue, Guimarães the first city of Portugal that is placed about 50 km from Porto. Near to the Penha Mountain where it is possible to see the entire city, it is an exceptionally well-preserved town showing the evolution of buildings types from the medieval settlement to the present day.

This year **INTERTECH** is hosted by the **UMINHO – University of Minho** and **CCG** – **Computer Graphics Center**, both prominent organizations in Europe, providing magnificent environment for the accomplishment of the event.

The **INTERTECH'2014 – XIII International Conference on Engineering and Technology Education** is organized by **COPEC – Science and Education Research Council** and promoted by **INTERTECH - International Council for Engineering and Technology Education** in Technical Cooperation (in alphabetical order): AAMP (Fishing Museum Friends Society), ABENC (Brazilian Society of Civil Engineers), ABENGE (Brazilian Society for Engineering Education), AENUI (Asociación de Enseñantes Universitarios de la Informática), ASEE (American Society for Engineering Education), ASIBEI (Ibero-American Association of Engineering Education Institutions), GCMM (Global Congress on Manufacturing and Management), IEEE-Ed.Soc. (Education Society of the Institute of Electrical and Electronics Engineers), IFEES (International Federation of Engineering Education Societies), IGIP (Internationale Gesellschaft für Ingenieurpädagogik), ISTEC (Ibero-American Science & Technology Education Consortium), OERN (Institute of Engineers of Portugal – North Region), Porto Gente (PortFolk), RBE (Brazilian Network of Engineering), RCI (Réseau Carthagène d'Ingénierie), SBA (Brazilian Automation Society), SEFI (Société Européenne pour la Formation des Ingénieurs), SHERO (Safety, Health and Environment Research Organization), SPEE (Portuguese Society for Engineering Education), SPEED (Student Platform for Engineering Education Development), WCCA (World Council on Communication and Arts) and WCSEIT (World Council on Systems Engineering and Information Technology) and Cultural Cooperation of Guimarães City Hall, Mais Brasil Association and General Consulate of Brazil in Porto.

We have to thank in special our sponsors FAPESP (State of São Paulo Research Foundation), CNPq (National Council for Scientific and Technological Development), CAPES (Coordination for Improvement of Personnel of Superior Level) and SUPNET - Technology & Information.

Our thanks to all the participants and we would like to express our appreciation for the hard work of the team that helped us throughout the congress and that really cooperated for the success of the event such as the local organizing committee members, the staff. Our deepest gratitude to the President of the Municipality of Guimarães Mr. Domingos Bragança, Prof. Dr. Rosa Vasconcelos Vice President of SPEE - Portuguese Society for Engineering Education and Prof. Dr. Luis Amaral President of CCG – Computer Graphics Center, for their exceptional efforts. And we could never forget Prof. Muthar Al-Ubaidi the President of **INTERTECH - International Council for Engineering and Technology Education.**

We believe that all the participants have taken the best of this experience.

Thank you all.

Prof. Dr. Claudio da Rocha Brito
GENERAL CHAIR
President of COPEC

Message from the Technical Program Chair

On behalf of the Technical Program Committee of **INTERTECH'2014 – XIII International Conference on Engineering and Technology Education** I have to say that it has been a great pleasure to count with the all the papers submitted to the congress.

INTERTECH is a traditional congress in the field of engineering and technology education that more than 26 years has been accomplished always reaching its goal. We strongly believe that this meeting has once again provided an opportunity to advance communication between academics, researchers and industry. It is during this event that participants from around the world came together, where scientists from the university, the industry, and young researchers had the chance to network and exchanging useful knowledge in one location. It is a major contribution for the development and dissemination of knowledge.

We are very glad to have had this XIII edition of INTERTECH in Guimarães that is a city steeped in history with a rich cultural heritage. It is a thriving, stylish, and vibrant place, renowned for its strong history, as well as its passion for the arts and culture. Equally great are the host Institutions **University of Minho** and **CCG** - **Computer Graphics Center** and the local committee members who made a great job.

We have put together an exciting congress with a wide representation of fields, specializations and interests. The program included a variety of panels and roundtables designed to present cutting-edge research and theory. This successful congress program was possible thanks to the hard work of all staff members, reviewers and the local committee. We are sure that the congress has contributed to enlighten and provide a unique experience to all who took part in the event.

Before I close this message I would like to thank each of authors and participants for their collaborations, for attending the congress and bringing their expertise to our gathering.

Thank you all and enjoy the scientific experience!

Prof. Dr. Melany M. Ciampi
TECHNICAL PROGRAM CHAIR
President of SHERO

Message from the Local Chair

It is our great pleasure to welcome you to the **INTERTECH'2014 – XIII International Conference on Engineering and Technology Education**, to be held in Guimarães, Portugal, organized by COPEC – Science and Education Research Council and hosted by University of Minho and CCG – Computer Graphics Center.

Guimarães is located in one of the most beautiful landscapes of the North of Portugal. In 2001, the Historic Centre of Guimarães was declared a World Heritage Site by UNESCO. The city is recognized by its beauty and historical monuments. As the first capital of Portugal, Guimarães is known as the place where the country was born - "The Cradle City" or "Birthplace City".

The University of Minho (UMinho), founded in 1973, began its academic activity in 1975/76. UMinho is renowned for the quality of its research and teaching, the quality of its students, the public recognition given to its Alumni, and for its intervention and strong links with the local community and the surrounding region.

UMinho has a student population of 16.000, out of which 1.900 are postgraduate students. The University has 1.200 teaching staff, of whom 850 hold a PhD, and 600 administrative and technical staff. UMinho has two campi located 20 km apart: one in Braga and the other in Guimarães.

Based on the campus of Azurém, in Guimarães, CCG is a private owned and non-profit association that positions itself as an "interface" between the source of knowledge (University of Minho) and market through applied research and technological development in fields related to computer graphics, information technology, communication and electronics and its applications.

This is the environment that we provide to the **INTERTECH'2014** and we are making our best to welcome everyone.

I expect you will find the experience here enjoyable and valuable as you participate in the broad range of session and social activities that have been scheduled..

Prof. Dr. Rosa Vasconcelos
Prof. Dr. Luis Amaral
LOCAL CHAIRS

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Technical Program Chair:
Melany M. Ciampi

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Luis Amaral

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Walter W. Buchanan, USA
Yolanda Guran-Postlethwaite, USA

Engineering education in a technology-dependent World

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Guimarães, Portugal

PROGRAM

Edited by
Claudio da Rocha Brito
Melany M. Ciampi

International Council for Engineering and Technology Education

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INTERTECH'2014– Program at Glance

Time	Sunday 16	Monday 17	Tuesday 18	Wednesday 19	Time
8:30 am 9:00 am	Free	Registration	Registration	Registration	8:30 am 9:00 am
9:00 am 9:30 am		Opening Session	Technical Sessions	Workshop I	9:00 am 9:30 am
9:30 am 10:00 am					9:30 am 10:00 am
10:00 am 10:30 am		Plenary Session I			10:00 am 10:30 am
10:30 am 11:00 am		Coffee Break	Coffee Break	Coffee Break	10:30 am 11:00 am
11:00 am 11:30 am		Plenary Session II	Technical Sessions	Workshop I	11:00 am 11:30 am
11:30 am 12:00 pm					11:30 am 12:00 pm
12:00 pm 12:30 pm					12:00 pm 12:30 pm
12:30 pm 1:00 pm	Registration	Lunch	Lunch	Lunch	12:30 pm 1:00 pm
1:00 pm 1:30 pm					1:00 pm 1:30 pm
1:30 pm 2:00 pm					1:30 pm 2:00 pm
2:00 pm 2:30 pm					2:00 pm 2:30 pm
2:30 pm 3:00 pm	Cultural Session	Technical Sessions	Technical Sessions	Workshop II	2:30 pm 3:00 pm
3:00 pm 3:30 pm					3:00 pm 3:30 pm
3:30 pm 4:00 pm					3:30 pm 4:00 pm
4:00 pm 4:30 pm		Coffee Break	Coffee Break		4:00 pm 4:30 pm
4:30 pm 5:00 pm		Technical Sessions	Closing Session	Coffee Break	4:30 pm 5:00 pm
5:00 pm 5:30 pm			Free	Workshop III	5:00 pm 5:30 pm
5:30 pm 6:00 pm					5:30 pm 6:00 pm
6:00 pm 6:30 pm		Cocktail Party			6:00 pm 6:30 pm
6:30 pm 7:00 pm					6:30 pm 7:00 pm
7:00 pm 7:30 pm				Free	7:00 pm 7:30 pm
7:30 pm 8:00 pm					7:30 pm 8:00 pm
8:00 pm 8:30 pm	Free	Free	Banquet **(for adhesion)**		8:00 pm 8:30 pm
8:30 pm 9:00 pm					8:30 pm 9:00 pm
9:00 pm 9:30 pm					9:00 pm 9:30 pm
9:30 pm 10:00 pm					9:30 pm 10:00 pm

Session and Presentation Codes

Codes are used to determine when and where a paper is presented.

Technical Session Coding

A four-character designator is associated with each technical session, as in **LDTN**

Where:

L – is a letter that designates the language of the session:

E – designates English sessions and papers;
P – designates Portuguese sessions and papers;
S – designates Spanish sessions and papers;

D – is a letter that designates the day of the session:

M – designates Monday sessions and papers;
T – designates Tuesday sessions and papers;

T – is a number that designates the time slot for the session:

1 is early morning (9:00 am - 10:30 am);
2 is late morning (11:00 am - 12:30 pm);
3 is early afternoon (2:30 pm - 4:00 pm);
4 is late afternoon (4:30 pm - 6:00 pm);

Note.

Five minutes will be allowed for introductions and instructions at the beginning of each session. Each paper will be given 10 minutes for the total presentation, with two minutes for questions. All papers will start in 12 – minutes increments to allow conference attendees to "session hop" hear papers of interest. If there is a no-show author in a session, a 12 - minutes break will be called. ***Papers will not be moved up in sessions.***

Papers times for sessions are shown below. (H is a letter that designates hour of the day).

Session Begins	H:00	H:30
First paper	H:05	H:35
Second Paper	H:17	H:47
Third Paper	H:29	H:59
Fourth Paper	H:41	(H+1):11
Fifth paper	H:53	(H+1):23
Sixth paper	(H+1):05	(H+1):35
Seventh paper	(H+1):17	(H+1):47
Session Ends	(H+1):29	(H+1):59

Sunday – March, 16

12:30 pm – 2:30 pm
REGISTRATION

The Registration Desk on Sunday will open at 12:30 pm in the lobby of Hotel Toural

2:30 pm – 8:00 pm
CULTURAL SESSION

Nestled into a valley in the mountainous Minho region some 30 minutes northeast of the seaside city of Porto, Guimarães was the first capital of the burgeoning kingdom of "Portucale." Its current motto: "Portugal was born here." And, indeed, history is everywhere. Visitors can spend the night in regal 900-year-old pousadas or tour a restored 10th-century castle. The Paço dos Duques de Bragança is an eye-catchingly austere palace and locals will point out that much of its imperial-Gothic grandeur is a product of a comprehensive 20th-century renovation during the regime of the dictator António de Oliveira Salazar.

As a historical site, the city surely boasts museums that house extensive collections of historical pieces and artifacts. One of these is the Alberto Sampaio Museum, which mainly exhibits religious art. Its most important possessions are the tunic worn by Joao I in the 1385 Battle of Aljubarrota and a silver altarpiece that is said to have been taken from the defeated Spanish king. Then there is the Martins Sarmento Museum, which houses a collection of historical pieces found from the Celtic settlement of Citania de Briteiros. Furthermore, the Citania de Briteiros is an archaelogical site that is open for visitors to marvel at. It is founded on 150 stone huts, two of which were restored to their original appearance.

From the castle, the beautiful cobbled **Rua de Santa Maria** has remained essentially unchanged for centuries, and leads down into the heart of the old town, where there are superbly restored historic buildings. One of those buildings is the former 16th-century Baroque convent of Santa Maria, now serving as the **City Hall**.

At the end of the street are two delightful squares with outdoor cafes and balconied houses, **Praça de Santiago** and **Largo da Oliveira**. At Largo da Oliveira are the old Town Hall and the **Church of Nossa Senhora da Oliveira**, with a **Gothic shrine** erected in 1340 standing before it. The sprawling Vila Flor, though, has been at the helm of the city's awakening, hosting everything from revamped open-air Shakespeare productions to large-scale gigs by foreign indie acts.

Outside the historic center, young creative talent is attempting a similar feat, transforming the city's semi-derelict industrial zones into hives of artistic enterprise. Guimarães has long been the country's largest textile-manufacturing hub, but since the early '90s, cheap overseas labor has lured businesses away from the area, and many factories stand vacant. One of these buildings is now home to the Center for Arts and Architecture. Opening to the public the center is the brainchild of the architects Ricardo Areias, a Guimarães native, and his wife, Maria Luis Neiva. In 2008, the pair returned from New York, where Mr. Areias studied and later taught at Columbia University, with the goal of opening an arts cooperative similar to places they'd seen develop in Brooklyn. The former mill now has production studios, an architecture library, a screening room, exhibition and rehearsal spaces and a black box theater.

Sophisticated Portuguese fare can also be found in the city center, including at Histórico, which reopened in a smartly renovated 17th-century palace. In the restaurant's picturesque courtyard, well-maintained middle-aged professionals drink rich Douro wines, listen to live fado music, and dine on bacalhau, or codfish, which is grilled or baked into creamy potato casserole. Another highlight is the alheira, a crusty sausage made from partridge, chicken and bread that was reputedly invented by Jews during the Inquisition in an attempt to pass themselves off as good, pork-loving Catholics.

Let's enjoy this entire complex full of history, culture and science.

A walking tour will departure from the Hotel Toural at 2:30pm.

Picture and Source of information: http://whc.unesco.org/en/list/1031

Monday – March, 17

8:30 am – 3:30 pm
REGISTRATION

9:00 am – 10:00 am
OPENING SESSION
Chair: **Prof. Dr. Claudio da Rocha Brito** – General Chair of INTERTECH'2014
Prof. Dr. Melany M. Ciampi – Technical Program Chair of INTERTECH'2014
Prof. Dr. Luis Amaral – Local Chair of INTERTECH'2014
Prof. Dr. Rosa Vasconcelos – Local Chair of INTERTECH'2014
Prof. Dr. Muthar Al-Ubaidi – President of INTERTECH

10:00 am – 10:30 am
PLENARY SESSION I
Chair: **Prof. Dr. Claudio da Rocha Brito** – President of COPEC
ENGINEERING EDUCATION IN A TECHNOLOGY-DEPENDENT WORLD
Speaker: **Prof. Dr. Melany M. Ciampi** – President of SHERO

10:30 am – 11:00 am
Coffee Break

11:00 am – 11:30 pm
PLENARY SESSION II
Chair: **Prof. Dr. António Ferrari** – President of SPEE - Portuguese Society for Engineering Education, Portugal
Title: **HOW THE AMERICAN SOCIETY FOR ENGINEERING EDUCATION CAN PROMOTE ENGINEERING EDUCATION INTERNATIONALLY**
Speaker: **Prof. Dr. Walter W. Buchanan** – President of ASEE - American Society for Engineering Education, USA
Debaters: **Prof. Dr. Manuel Castro** – President of IEEE – Education Society, Spain
Prof. Dr. Muthar Al-Ubaidi – President of INTERTECH – International Council for Engineering and Technology Education, USA

12:30 pm – 2:30 pm
LUNCH

2:30 pm – 4:00 pm
TECHNICAL SESSION EM3A
Chairs
Bjarne Schmidt
Mingli He

TECHNICAL SESSION PM3A
Chairs
Falcondes José M. de Seixas
Francisco Carlos V. Malange

TECHNICAL SESSION SM3A
Chairs
Fernando N. Bertolotti
Fernando da Casa Martín

4:00 pm – 4:30 pm
Coffee Break

4:30 pm – 6:00 pm
TECHNICAL SESSION EM4A
Chairs
Abieyuwa Aghayere
Janak Dave

TECHNICAL SESSION PM4A
Chairs
Dácio Guimarães de Moura
Vânia Cristina Pires Nogueira Valente

TECHNICAL SESSION PM4B
Chairs
Ricardo Villarroel Dávalos
Walnório Graça Ferreira

6:00 pm – 8:00 pm
WELCOME COCKTAIL

All the conference attendees are welcome to join us for the “Welcome Cocktail” on Sunday at 6:00 pm. It is the opportunity to get in touch with old colleagues and make new friends in a nice environment.

Tuesday – March, 18

8:30 am – 3:30 pm
REGISTRATION

9:00 am – 10:30 am
TECHNICAL SESSION ET1A
Chairs
Mauricio Noya
José Carlos Rodrigues de Oliveira

9:00 am – 10:30 am
TECHNICAL SESSION PT1A
Chairs
Rosa Vasconcelos
Luis Amaral

9:00 am – 10:30 am
TECHNICAL SESSION PT1B

Chairs
Jean Marcos de Souza Ribeiro
Roberto Scalco

10:30 am – 11:00 am
Coffee Break

11:00 am – 12:30 pm
TECHNICAL SESSION PT2A
Chairs
Danilo Amaral
Leonardo André Testoni

TECHNICAL SESSION PT2B
Chairs
Frederico Gadelha Guimarães
Maria Aparecida Faustino Pires

TECHNICAL SESSION PT2C
Chairs
Jose Benedito Sacomano
Dario Cardoso de Lima

12:30 pm – 2:30 pm
LUNCH

2:30 pm – 4:00 pm
TECHNICAL SESSION PT3A
Chairs
Roberto Scalco
Marina Valentim Barros

TECHNICAL SESSION PT3B
Chairs
Fernando Gromiko Helena
Leonardo André Testoni

TECHNICAL SESSION PT3C
Chairs
Simone de Fátima Pinheiro Pereira
Cléber Silva e Silva

TECHNICAL SESSION PT3D
Chairs
Victor Freitas de Azerêdo Barros
Herik Zednik Rodrigues

4:00 pm – 4:30 pm
Coffee Break

4:30 pm – 5:00 pm
CLOSING SESSION
Chair: **Prof. Dr. Claudio da Rocha Brito** – General Chair of INTERTECH'2014
Prof. Dr. Melany M. Ciampi – Technical Program Chair of INTERTECH'2014
Prof. Dr. Luis Amaral – Local Chair of INTERTECH'2014
Prof. Dr. Rosa Vasconcelos – Local Chair of INTERTECH'2014
Prof. Dr. Muthar Al-Ubaidi – President of INTERTECH

8:00 pm – 11:00 pm
THE BANQUET

Let's have a good time gathering with colleagues in an inspiring environment for a pleasant dinner. The tickets will be available at the reception desk.

Wednesday – March, 19

8:30 am – 3:30 pm
REGISTRATION

9:00 am – 12:30 pm

WORKSHOP I
UTILIZING SOLIDWORKS SOFTWARE IN ENGINEERING DESIGN COURSES
Prof. Dr. Amir Salehpour – University of Cincinnati – College of Engineering and Applied Science (CEAS) – Department of Mechanical and Materials Engineering (MME) – USA

12:30 pm – 2:30 pm
LUNCH

2:30 pm – 4:30 pm
WORKSHOP II
ANALISE QUALITATIVA COM RECURSO AO WEBQDA – APLICAÇÕES NA EDUCAÇÃO EM ENGENHARIA E TECNOLOGIA (in Portuguese)
António Pedro Costa – Ludomedia e Universidade de Aveiro
Luis Paulo Reis – Universidade do Minho

4:30 pm – 5:00 pm
Coffee Break

5:00 pm – 7:00 pm
WORKSHOP III
ANALISE QUANTITATIVA COM RECURSO AO SPSS – APLICAÇÕES NA EDUCAÇÃO EM ENGENHARIA E TECNOLOGIA (in Portuguese)
Brígida Mónica Faria – ESTSP-Inst. Politécnico do Porto
Luis Paulo Reis – Universidade do Minho

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ABSTRACTS

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Plenary Sessions

ENGINEERING EDUCATION IN A TECHNOLOGY-DEPENDENT WORLD

Claudio da Rocha Brito, Melany M. Ciampi, Rosa Vasconcelos, Luis Amaral, Muthar Al-Ubaidi

Education is the core of any nation development, of a community or personal. Technology without any doubt is enhancing education in every level. It is for sure a society that is depending on technology for deployment of information, communication, and network in real time. In a short period of time, social technologies have given social interactions the speed and scale of the Internet. It affects the way people work, live and make business. This work intends just to show a little of INTERTECH an event that is happening for more than 24 years and its contributions for engineering and technology education. An endeavor of many scientists in order to provide a breeding ground for discussions about engineering and technology education so important aspects for the formation of professionals and researchers prepared to face the future. The theme of the congress is Engineering Education in a Technology-Dependent World and it has raised a considerable amount of papers of great valuable.

Technical Sessions

TECHNICAL SESSION EM3A

ENGINEERING TECHNOLOGY EDUCATION TOPICS

Walter W. Buchanan, Ali Mehrabian

Presented here are engineering technology education topics. Women who study engineering are excited about science and to discover how science can be applied to make positive change in the world. Successful strategies at Camosun College for building capacity for gender balance include encouraging the development of programs that portray positive role models for women. To enhance creativity in engineering and engineering technology students, the Research Initiation Grant in Engineering Education project at Drexel University has established interdisciplinary research collaboration between engineering/engineering technology faculty and cognitive scientists to test methods for integrating creativity pedagogy into undergraduate courses. The impact of construction industry on the economy is immense. Green and sustainability are embedded in many construction-related curriculums, while many more educational institutions seek to incorporate it into their more modern construction curriculum. Here are encapsulated some existing constraints in the existing and the new processes with discussion of some remedial action.

SOME EXISTING CONSTRAINTS IN GREEN CONSTRUCTION EDUCATION

Ali Mehrabian, Walter W. Buchanan

The impact of construction industry on the economy is immense. In recent years the demands for green materials and overall sustainability to achieve high quality and healthy structures have increased. Part of this demand is due to the very own nature of the field of construction: clients pay for the construction of their individual and unique projects, and thus, they demand better quality, lower costs, and more sustainability of the projects. However, undoubtedly there are existing challenges and constrains in the quest. This article encapsulates some of these constraints and discusses some remedial actions. Bringing real-world practical experience into classrooms by faculty would be exceptionally valuable to the students, the departments, and the institutions of higher education by attracting more students. Some different but practical methods of achieving such practical experience is gained through project-based practical work experience, consulting, continuing education, seminars, workshops, and industry-supported projects.

INCREASING ENGINEERING STUDENTS' MOTIVATION BY USE OF PENCASTS AND PEER INSTRUCTION

Bjarne Schmidt

A pencast is a new audio-visual tool where the manufacturing of a hand-written note is recorded in real-time along with the instructor's vocal explanations. This computer file can be played (with sound) by the student, giving the impression of a small animated video. This paper presents a teaching strategy for an engineering dynamics course using pencasts and peer instruction in order to increase the students' motivation. A set of questionnaire was given to evaluate the students' perception of the different learning options. The study shows that the students found online pencasts very useful as a supplement to studying a traditional textbook. In addition, the implementation of an electronic audience response system to enhance active learning by peer instruction in combination with traditional lecturing was highly appreciated by the students. Finally, the study indicates that the proposed teaching strategy leads to increased motivation and engagement amongst students

WORKING WITH INDUSTRIAL PROJECTS CAPSTONE EXPERIENCES: PROOF OF CONCEPT PROJECTS

Mingli He

The undergraduate research programs at our University attract more and more attentions from local companies. Engineering companies participate in the programs by providing projects for engineering technology students to work on. Some of the projects may be improvement of current products, development of new products, and/or just some ideas. A production company may not have the extra engineering power to work on those projects or the results of such research may not be implemented immediately. Most of the projects may not require a fully working engineering product as result. We call this type projects proof of concept projects. There was only one company in working with us when we started incorporating undergraduate student research into MET curriculum in fall of 2008, while in 2012-2013 our students are working on five projects from four companies. The success of the project based classes provided bases for new curriculum development as well.

VERTICAL MODULARISATION AND VOCATIONAL EXPERIMENT

Lükő István

Arrangement of the modular curriculum has been used on horizontal level as far at development of the profession frame. We need to note the superposition of the qualifications. I have called this model: vertical modularization. The developments and races of the curriculum, modularization and the historical period of MES conception, and system of professional function have been invented in the theorem of pedagogy-vocational training. The aim of essay was: how can solve a concrete task in team the students of the carpenter trainee, wood industry technical college, production animator in wood industry, and engineer of wood industry. Making of two desks and five student-desks were the concrete task. In the course of the essay we analyzed the roles of the future scope of activities, the system of activity and substance matters, and the ability of the professional communication (terminology, technological drawing, cooperation learning). We analyzed too, the problem-solved-thinking, qualitative differentiation to the shares of the temporal work. With this end in view we have sought the collective, functional module elements (seed) to the complete qualification levels (trainee, technician, production animator, and engineer) by certificate/denial of our hypothesis.

A GLOBAL VISION FOR THE 2020 TECHNOLOGY AND SOCIETY COURSE

David A. Rogers, Orlando R. Baiocchi

From many corners of the world have come accusing fingers pointing to technological development as the source of a multitude of human problems. Admittedly, this has been and is a challenge to the engineering profession. The university technology and society course is an opportunity for educators to present a constructive view pointing to both the benefits and burdens that technological development brings to society and the responsibility of engineers to choose the best path forward. This paper assesses the impact this course has had on engineering and non-engineering students both past and present. Specific course topics might include: indigenous peoples and the environment, electronic media, weapons of mass destruction, energy production, genetically modified organisms, and climate change. The technology and society course is a great opportunity to pursue issues critical to all of life.

WIRELESS SENSOR NETWORKS RESEARCH COOPERATION BETWEEN UNIVERSITY OF WASHINGTON TACOMA AND BRAZILIAN UNIVERSITIES

Orlando R. Baiocchi, F. B. S. Carvalho, C. P. Souza, S. A. F. Soares, B. G.Leal, R. M. Bacurau, L. Duarte

This paper aims to describe the current technical and academic achievements resulting from the cooperation agreements between the Institute of Technology-University of Washington Tacoma (UWT) and Brazilian universities and research institutions. UWT hosted Brazilian undergraduate and graduate students in the academic year 2012-2013. The University of Washington, the Brazilian Science Without Borders Program and the Santander Bank funded these students. The Computer Engineering and Systems program at UWT provided the academic, cultural and research resources that make these achievements possible. In particular, a Wireless Sensors Networks (WSN) research group was created to study fundamental concepts and technical implementations. After returning to Brazil, the students continued the research collaboration with UWT in different topics of WSN notably in applications as agricultural irrigation, fire detection, emergency alerts, building occupancy optimization, energy harvesting and energy consumption management. Faculty in Brazilian universities are also part of these joint efforts and new funding was recently approved to extend this successful partnership.

TECHNICAL SESSION PM3A

DIDATIC PROCEDURES TO CONNECT AN INDUCTION GENERATOR IN THE GRID

Falcondes José M. de Seixas, Francisco Carlos V. Malange, Claudiner M. Seixas, Carlos S. M. Neto, Priscila da Silva Oliveira

This paper explain the connection of a squirrel cage type machine, working as a generator, connected directly to the electrical grid, using a DC motor as the primary source. A didactic procedure is used to clarify the mechanism that the induction machine change energy between two sources. The theoretical part explains the three-phase induction machine, emphasizing the power vs. speed curve. The experimental part consists in the acceleration of the induction machine, as a motor, up to near synchronous speed. At this moment, the DC motor is ready to accelerate the induction machine above the synchronous speed, highlighting the moment as the machine change from motor to generator. Some tables, curves and waveforms are presented to show the transition between motor and generator and confirm the success of the proposed didactic procedure.

AN EASY-TO-USE DEVELOPMENT KIT FOR A MICROCONTROLLER COURSE BASED ON THE 8051

Mikhail Anatholy Koslowski, Gustavo Benvenutti Borba, Rubens Alexandre de Faria, Rafael Eleodoro de Goes

Although the almost four decades old MCS51 core presents limitations if compared to many recently developed cores, its CISC instruction-set architecture and broad support are excellent features for teaching microcontrollers and assembly language. The model adopted for the development kit presented in this paper, AT89C5131A-M, differs from the regular MCS51s especially due to the embedded USB controller, as well as SPI, I2C and PWM controllers. No additional resources are necessary to program the microcontrollers' flash, since it presents bootloader functionality for this purpose. The kit also allows the target debugging using a free available monitor program, by means of the serial or USB port (a serial/USB cable is necessary to debug via the USB). Other resources are available in the kit: A/D converter, RTC and LCD module, making the kit a useful tool for a large variety of laboratory experiments. All the components are through-hole, in order to facilitate the soldering by the students. Using the proposed kit, a microcontroller course can be held in a very simple environment and with a good involvement of the students.

MODELING A SHUNT ACTIVE FILTER USING DIFFERENTIAL EVOLUTION

Alexandro Pastick de Carvalho, Ruben Barros Godoy, Lucio Henrique Pereira, João Onofre Pereira Pinto

This paper proposes the modeling of a Parallel Active Filter (PAF) using a search algorithm to define the optimum parameters of inductance (Lf), voltage (Vdc) and bandwidth (Bw), since these parameters are mandatory to improve the performance of the modulation using hysteresis. The design of FAP devices may be obtained through

the search algorithm of optimal points. The simulation prevailing contributes to the security of the system that should receive the compensation device as the design considers the current load. After finding the parameters through the optimization technique (based on an evolutionary algorithm named Differential Evolution), the active filter performance was evaluated and some simulation results proved the validity of the proposal. The association of DE with instantaneous power theory berfore utilized in active parallel filters, was capable mitigate the currentes harmonics so traht eliminate the unbalance between phases, presenting satisfactory results.

TECHNICAL SESSION SM3A

LA IMPLANTACIÓN DEL TRABAJO FINAL DE GRADO EN LAS NUEVAS TITULACIONES. LA SITUACIÓN CONCRETA DEL GRADO DE INGENIERÍA DE EDIFICACIÓN (CIENCIA Y TECNOLOGÍA EN LA EDIFICACIÓN) COMO EXPERIENCIA PILOTO EN LA UNIVERSIDAD DE ALCALÁ (PROYECTO DE INNOVACIÓN DOCENT)

Fernando da Casa Martín, Andrés García Bodega, Enrique Fernandez Tapia

The European Higher Education Area (Bologna) provides a teaching methodology, not experienced in the implementation of the Final Work Degree (FGW) as a subject. We need to know what the main problems that arise in their development are. So that can be the basis for a general standard for FGW, and analyze the particularities in Technical Education. We report the development of a pilot in the Grade of Building Engineering, University of Alcalá. Their results and great potential of the proposed methodology. To study specific problems in their development, both from the point of view of the student and from the point of view of the teacher, including aspects such as the obligation of public defense before the Tribunal. The work will develop the proposed model in its fundamental aspects and experimental analysis of the implementation of the first three courses.

PANORAMA SOBRE PROGRAMAS DE SIMULACION DE CIRCUITOS DE ELECTRONICA DE POTENCIA

Fernando N. Bertolotti, Fabiana Ferreira

This work presents an resume about free programs used to simulate electric power electronic circuits.There are commercial versions of simulation programs with a lot of functions, capabilities and devices models library. These programs are used by companies, institutes and universities to development, investigation and design of power electronics equipment. However, in special cases how teaching of circuit analysis, power electronics and industrial control would work with free software versions. It will give an overlook about free software to power electronic simulation cases. pointing advantages and limitations. It will presents some examples using the free programs proposed and talk about the convenience to use this programs how didactic tool in power electronics courses.

TECHNICAL SESSION EM4A

EXPERIENTIAL LEARNING AND TEACHING AN HONORS PROGRAM

Janak Dave, Janet Dong

The University of Cincinnati (UC) offers an Honors Program to the top 7% of undergraduate students in an engaging environment in which students are inspired to learn more, do more, and be more. Students are challenged through honors seminars and experiential learning projects, community engagement, research and novel applications of technologies, and creative arts. This paper will describe how University Honors Program is operated, the requirements, and the teaching experience of two faculty members in the Mechanical Engineering Technology program in the College of Engineering and Applied Science (CEAS). The course was a study abroad course for all UC students

USING SIMPLEX PROBLEM SOLVING PROCESS TO IMPROVE TEAM PROJECT PERFORMANCE

Janet Dong, Janak Dave

Students working toward a baccalaureate degree in Mechanical Engineering Technology at the University of Cincinnati are required to complete a “Design, Build, and Test” senior capstone project. This four-course sequence senior project is designed to facilitate students’ abilities to synthesize and apply the knowledge and skills that have been acquired prior to their senior year. This sequence enhances their abilities to solve open-ended problems and to prepare them for the transition from an academic environment to industry. Some capstone design projects are team projects. In addition to expertise and knowledge acquired from their coursework and co-ops, the team projects also require team members to develop additional skills needed to be successful in a team oriented business world. This paper describes the application of the Simplex system – A creative problem solving method, to one of the 2008-2009 team projects. This system was used to improve the quality of the project while experiencing rich team environment. The short description of the capstone design course sequence and comparison to a similar project without using Simplex system is also discussed

LINUX EXPERIENCE IN THE GENERAL OPERATING SYSTEMS CLASS

James Wolfer

This work profiles a collection of demonstrations and assignments designed to augment a hands-on operating systems class featuring an instructional operating system with examples from the more complex Linux environment. In addition to describing the course and its place in the curriculum, hands-on student activities involving Linux device-drivers and user-space file systems are described, along with practical observations and resources for their implementation

REFRESHING THE COMPUTER LITERACY COURSE: COMPUTING FOR THE GENERAL EDUCATION STUDENT

James Wolfer

Computer literacy classes for non-computing majors are received with less than enthusiastic regard by many students. Viewed as simply another general education requirement toward graduation, these classes do not command the attention we would like from students forming the next generation of professionals and policy makers. Previous work featured a series of demonstrations and experiences specifically designed to engage students with both computing principles and possibilities. These included topics ranging from programming and theory to artificial intelligence including demonstrations of robotics, haptic human-computer interaction, medical imaging, evolutionary computing, and art. This work expands the previous course to include demonstrations and activities designed to gain insight into contemporary topics such as 3D printing, natural-language processing, affective computing, encryption, data sonification, and brain-computer interfacing. Taken together, we believe that these updated experiences provide broad insight into computing that can serve the non-computing students in their future work

GROUP MODELING-BUILDING: LESSONS LEARNED FROM A CASE STUDY

Rina Sadia

System Thinking refers to the interrelationship between the parts of the organization that intend to design, produce and distribute products or services. System Thinking is actually a conceptual language that encourages professionals into using "feedback loop" thinking rather than mere linear thinking. In order to solve a problem, System Thinking requires the building of a model by a diverse group with a varied input. Research has shown that in spite of conventional guidelines for eliciting this input from group members, factors such the environment, culture and work conditions can impact the understanding of the system's behavior. It is recommended to incorporate this concept within all areas of engineering education as it trains future engineers to create long-term learning processes within their organization that could bring about improved organizational effectiveness.

IMPROVING DESIGN OUTCOMES USING ASSESSMENT BASED DOUBLE LOOP LEARNING

Paul J. Fortier, Judith Sims-Knight, Benjamin Viall

Traditional engineering education revolves around the use of stove-pipe curricula, using mostly passive lectures and cookbook laboratories with pre-determined results. Real-world engineering is not pre-determined; problems are open-ended with many possible correct results. In addition real-world engineering is often team-oriented requiring active participation from all. This paper describes a proof of concept study focused on determining the efficacy of assessment based double loop learning utilized to improve engineering student's design skills. Our research study determined a boundary level by examining student's present design skills over all 4 years of the electrical and computer engineering (ECE) curriculum. During the second and third years of the study, junior engineering students took a new studio-based open-ended design course where students use multiple design process assessments to improve upon their use of sound design practice, thereby improving their outcomes in design. Initial results show very promising design skill improvements and design assessment tools

ENHANCING CREATIVITY IN ENGINEERING AND ENGINEERING TECHNOLOGY STUDENTS

Michelle Klawans, Abieyuwa Aghayere, Gennady Friedman, Vladimir Genis, Jennifer Katz-Buonincontro, Fredricka Reisman

While engineering projects demand creative and innovative approaches to produce new and useful ideas and projects, the traditional engineering curriculum has fallen short in significantly enhancing the creative capabilities of engineering students as they progress through undergraduate programs. To help address this creativity gap the Research Initiation Grant in Engineering Education (RIGEE) project has established an interdisciplinary research collaboration between engineering/engineering technology faculty and creativity and cognitive science experts to identify, develop, and test methods for integrating creativity into undergraduate engineering and engineering technology courses and enhancing the creative capacities of engineering and engineering technology students. This research project assesses eleven aspects of creative thinking as measured by the Reisman Diagnostic Creativity Assessment (RDCA), including originality, divergent thinking, and risk taking. During the 2012-2013 academic year, the RDCA was administered in several undergraduate engineering courses, some of which were taught by engineering professors who had undergone creativity training, and these courses have been labeled as "creativity" classes in the RIGEE protocol. Those courses taught by engineering professors with no formal creativity training have been labeled as "non-creativity" classes. Comparing the eleven domains of the RDCA between "creativity" and "non-creativity" classes will allow for an assessment of the efficacy of creativity training for engineering and engineering technology professors

TECHNICAL SESSION PM4A

METODOLOGIAS ATIVAS DE APRENDIZAGEM NO ENSINO DE ENGENHARIA

Eduardo Fernandes Barbosa, Dácio Guimarães de Moura

The teaching of Engineering has been the subject of many discussions focusing primarily curricular organizations, with less emphasis on learning methodologies for the development of professional competencies. One of the problems that concern many engineering courses is the lack of motivation of the students in relation to the type of education they receive, with consequences on the student performance and dropout rates. This article encourages the revision of traditional teaching practices and discusses the possibilities of active methodologies in the teaching of engineering. We focus on two active methodologies: Problem Based Learning and Project Based Learning. Both methodologies are derived from teaching conceptions which fulfills many current needs of Engineering courses and may contribute to innovative teaching practices in the context of professional education of the engineering student, overcoming many limitations of traditional teaching models

ESTIMATIVA DE FORÇAS NOS DISCOS LOMBARES EM MULHERES DURANTE O LEVANTAMENTO DE CARGAS

Danielle Rodrigues de Oliveira, Tamotsu Hirata, Luiz Heleno Moreira Duque

The task of material handling is a daily movement as both men and women. This study presents an integrated method of motion analysis of manual lifting load based on the 3D kinematic simulation model and to estimate the internal muscles forces acting on the lumbar spine, intervertebrae disc L5/S1 , besides the analysis of electromyographic muscles. The study explores the biomechanical view in women during manual lifting load based on the NIOSH equation, in two different posture: knee extension .and flexional mode. Were selected as sample 12 university volunteers aged 25.7 ± 4.3 years, mass 55.7 ± 7.0 kg and height of 1.6 ± 0.1 m. The results showed that for physical exercise practitioners, maximum NIOSH load level was reached on the discs established for men when they realized the condition of maximum voluntary contraction

IMPLEMENTANDO UM MODELO DE DISTRIBUIÇÃO DE ENERGIA ATRAVÉS DO USO DE REDES COMPLEXAS

Aleciana Vasconcelos Ortega, Luiz Fernando Bovolato, Mariângela de Carvalho Bovolato, Christiane Marie Schweitzer

There is a huge variety of systems that can be described by complex structures in the format of networks. These complex networks have certain properties that can be used in the analysis of various aspects of the systems and for many different purposes. This paper aims to investigate the structural properties and operation of energy distribution networks, considering different topologies and applications, in order to determine a model, its properties and its behavior through the use of complex networks. A test case of an electrical power distribution will be presented, with its corresponding graph that will, through complex network modeling, allow profound analysis of the network behavior, considering the performance characteristics as well as the resilience and fault identification. This will allow operators and engineers to check the practicality of the operation and management of the network, as well as help them planning and optimizing it with the use of the network resources.

PROJETO INOVADORES: UMA EXPERIÊNCIA DE TRABALHO COM PROJETO

Mariângela de Carvalho Bovolato, João Vitor Moreira Careta

The Innovative Project is based on the development of humanitarian work, able to awaken in entering the academic, socioeconomic concern with the spirit of leadership and research. The main goal is to spark interest in students for research work on energy efficiency. Search through group work with members of different courses of interest to undertake a project that values research, the increased level of integration, considering the multidisciplinary interaction. The project should have a link to the Introduction to the courses to be considered because there will be a greater commitment of the participants to the project. The first year students are initiated early in research and extension. The integration work with different courses deepens interpersonal development of the student, preparing him for the rigors of the job market, testing their leadership and communication

ESCREVENDO COM LEDs: UMA PROPOSTA DE ENSINO DO MOVIMENTO CIRCULAR PARA CURSOS DE ENGENHARIA

Leonardo André Testoni, Silvia Maria de Paula, Bárbara S. Jesus, Pedro L. P. Palosqui, Vinicius Cirino S. G. Cardoso

This paper aims to analyze the use of the experimental demonstration Physics lessons cycles basic engineering courses as part of the trigger conceptual evolution of the students during the process of teaching and learning based on scientific literacy. Specifically, the experiment used was that of many leds arranged in a metal bar, which effected a circular motion through computational aid, such leds during its rotational movement, gleamed different positions and intervals smaller than retinal persistence (reaction time of the brain necessary to distinguish two images), creating the sense of movement and allowing the "writing words in the air". The proposal was applied to a class of 1st year Engineering and the data obtained by video recordings of classroom where the demonstration was

presented, were analyzed in the light of the theory of playful experimentation and conceptual development by students.

DESIGN DE OBJETOS DE APRENDIZAGEM DIGITAL DO PONTO DE VISTA DA USABILIDADE

Gustavo Henrique Mochiuti, Vânia Cristina Pires Nogueira Valente

Technological resources and the media are contributing to socioeconomic development, including the education sector. Application of Digital Learning Objects support learning, serving as a tool for distance learning arrangements and classroom. The quality of design in instructional materials is one factor that implies the motivation of students and support their learning, within this context, the creation of educational interactive multimedia applications should excel the content and good usability, while facilitating user interaction. The aim of this paper was to establish parameters for the creation and management of Digital Learning Objects.

A INTERFERÊNCIA DA DINÂMICA REGIONAL SOBRE A IMPLANTAÇÃO E O PROCESSO EVOLUTIVO DOS DISTRITOS INDUSTRIAIS

Antônio Ricardo Chiquito, Vera Mariza Henriques de Miranda Costa

The fulfillment of the functions of the industrial districts depends directly on the conditions of the municipality and region in which if inserts. Therefore, to assess the results of the implantation of Industrial Districts is important to know the process of regional development, including productive activities and infrastructure availability. The various regions of the State of São Paulo/Brazil, feature an evolutionary process quite heterogeneous in terms of the presence/absence of infrastructure and predominant productive activities. The municipality of Andradina/SP/Brazil deployed the first industrial district in 1982 and this not provided the expected development. In 2011, from a development program proposed by the municipality, were created two new districts, which lie in the deployment process. The regional and local characteristics explain the fact of not having been designed industrial development, through of these districts, but rather, the development of activities in support to agro-industrial sectors that predominate in the region.

TECHNICAL SESSION PM4B

O USO DO DESENHO DE PROCESSOS DE NEGÓCIO PARA APOIAR O ENSINO DE PESQUISA OPERACIONAL

Ricardo Villarroel Dávalos, Mônica Maria Mendes Luna

Using of diagrams can support understand concepts relationships that are mapped when seeking a graphic representation of knowledge. Business processes representation provides an overview of organizational operations, allowing analysis, impact forecasting and activities improvement and optimization. In this scenario, Operations Research (OR) teaching focuses on the activities which can be optimized by mathematical programming methods or improved by simulations techniques. The main objective of this paper is to evaluate some experiences to support the OR teaching and the main contributions are related to the appropriate use of these resources.

IP: UM OBJETO DE APRENDIZAGEM PARA O ENSINO DE LÓGICA DE PROGRAMAÇÃO EM CURSOS DE NIVELAMENTO EM ENGENHARIA ELÉTRICA

Leonardo Ramon Nunes de Sousa, Marcus Santos de Sousa

This work presents the first stage the development of a learning object – called iP (initial Programming) – for to help in the process of education and learning in the programming logic to new students in the leveling courses in Electrical Engineering. Use of this educational environment was satisfactory as a tool of pedagogical aid. The objective of iP is to facilitate dynamically the students, inserting the key concepts, frameworks and standards in the programming's area before the minimum difficulties. For your interactivity, iP can be used after the registrations the

new students, encouraging them in the next skills and minimizing possible problems. Moreover, discussions on the iP deployment and use of learning objects in programming will be highlighted.

ANÁLISE E DESEMPENHO DO PROTOCOLO DE COMUNICAÇÃO DNP3 SOBRE REDES WIRELESS EM APLICAÇÕES SMART GRID

Alcides Ortega, Ailton Akira Shinoda, Christiane Marie Schweitzer

The paper presents simulation results of the IEEE 1815 DNP3 communication protocol encapsulation over TCP/IP operating on IEEE 802.11b wireless network for Smart Grid Applications. To perform the simulations was used the Network Simulator 2 (NS-2). This work has the goal to analyses and verifies the data communication performance of DNP3 in an ad hoc wireless network in relation to delay and packet error rate according the distance and hops number. In the results analyses was used the cumulative density function (CDF) and through the graphics is possible to see that the outstations down to a hop get better results comparing with the others. Despite the simulation results shown a large delay range between the nodes, all outstations get a feasible performance for real time monitoring. This Smart Grid application should not exceed 100 ms of delay.

ABORDAGEM PEDAGÓGICA DA TEORIA DA ESTABILIDADE ESTRUTURAL

Lais De Bortoli Lecchi, Augusto Badke Neto, Walnório Graça Ferreira, Adenílcia Fernanda Grobério Calenzan, Yargo Pezzin Souza

This article presents a conceptual and pedagogical approach with regard to the theory of structural-stability, including the terminologies involved as bifurcation, critical loads, limit points, dynamic jump and critical paths. In addition, this paper presents a computational numerical procedure for the analysis of the stability of mechanical systems geometrically nonlinear with one or two degrees of freedom, without loss of generality involved. The concepts and procedures presented in this work will be of great value not only for the teaching of the theory of stability at the undergraduate level, but also teaching at graduate courses in civil and mechanical engineering, as it provides details of the computational implementation, concepts of stability, analytical solution of geometrically nonlinear systems, as well as incremental-iterative solution based on Newton-Raphson method, using simple models with rigid bars and rotational and linear springs.

O USO DA FERRAMENTA BLOG COMO RECURSO TECNOLÓGICO DE DESENVOLVIMENTO DE DISCIPLINA CURRICULAR NO ENSINO SUPERIOR

Maria Tereza Ettinger de Oliveira, Hortência de Abreu Gonçalves, Zênia de Oliveira Nascimento

The blog foments the creativity and interactivity as strategy of access to contents. The is a web page that can be used frequently, with posts in a timeline that allow the user to locate himself among the subjects available online and also to insert his comments. In higher education, the blog enables the student the access to the contents of curricular subjects in an efficient and fast way that includes images, sounds, colors, visual and audio effects, and yet videos, texts and objects of learning. The objective of this essay is to analyze the blog as a tool, as a strategy of development of curricular subjects in higher education in order to form, to build knowledge associated to the shaping of skills and the development of abilities in solving problems. The research was made through printed and digital secondary sources, covering the period between 2005 and 2013.

IMPLEMENTAÇÃO DE MEDIDOR TRIFÁSICO DE ENERGIA ELETRÔNICO E ESTIMAÇÃO DO ERRO DE MEDIÇÃO

Marcio Carneiro Brito, João Onofre Pereira Pinto, Ruben Barros Godoy

This work presents the development of a dsp-based device that performs electric signals processing from triphasic system in order to measure active, reactive and apparent power from a bus. Therefore, three algorithms will be embedded associated with pq Theory, Conservative Power Theory and Definitions IEEE Standard 1459-2010. The Hardware system consist of a signal conditioning board, that use voltage and current sensors; and a control board that contains a TMS320C6713 float point DSP, an interface control with keys and display, and ETHERNET module.

After signal acquisition of voltages and currents the ADC0808 convert them to digital bits and outputted serially to DSP that apply the power algorithms. Some results are presented what is possible evaluate the model proposed from comparison among simulation and algorithm results since both are corresponding results being according to expected. Finally conclude that with advance of this work more results can be obtained.

DOENÇA DE GAUCHER: LEVANTAMENTO EPIDEMIOLÓGICO NO DISTRITO FEDERAL

Thiago da Silva Urcino, Marcus Alisson Araújo da Cunha, Juliana Paiva Lins, Márcia Silva de Oliveira

The Gaucher disease (DG) is an inborn error of metabolism, a rare pathology, despite being the most frequent lipidosis of lysosomal diseases group. It has autosomal recessive genetic inheritance, caused by a deficiency of the enzyme glucocerebrosidase, leading to accumulation of glucocerebrosides in the macrophages, mainly in the spleen, liver and bone marrow. The clinical manifestations depend on the degree of compromise of the enzyme and can be manifested in three forms: type I, II and III. This research mainly aims at making an epidemiological survey and the formation a profile of patients with DG in the Federal District. Data was collected in the Gerência do Componente Especializado da Assistência Farmacêutica/Secretaria de Saúde – GCEAF/SES, considering that in Brazil, there are few studies on concrete statistical data of DG in each region. The result of this study might assist the development new strategies for a more individualized and effective treatment.

TECHNICAL SESSION ET1A

EXPERIENCE OF RATING SYSTEM IMPLEMENTATION FOR 1st YEAR STUDENTS IN MADI STATE TECHNICAL UNIVERSITY

Vladimir G.Zakharov, Irina A. Avenarius

As a matter of fact a real control of a student's activity is being done in many Russian universities at the end of a semester, i.e. in January and in June: twice a year when every student has to pass an exam on a given subject. The rating system introduced at Physics Department of MADI allows to realize an effective current control throughout the whole semester. Lectures, seminars (practical works) and laboratory works are considered as milestones for a daily evaluation which takes into account all aspects of a student's activity. A system of evaluation marks has been elaborated to give a student an additional bonus chance at the exam

TEACHING CONTROL LAB WITH A REDUCED-SCALE ELEVATOR

José Carlos Rodrigues de Oliveira, André Martins Vaz

This paper describes the position control of a small-scale elevator, developed to teach Control in Electrical and in Control & Automation Engineering at Federal University of Minas Gerais, Brazil. The hardware was implemented in analog mode, with the elevator's power drive and position sensor showing good performance. The unstable integrator process was modeled through an innovative open-loop method, based on the position response to a step on the motor voltage. The well known frequency response method was also employed. A PID controller was designed, implemented and tested. Perturbations like impulses on the carriage were introduced, and the controller reacted to recuperate the desired position. The experimental module showed good technical and methodological results, being a cheaper alternative to the expensive modules found in the market. The utilization of waste electronic materials encourages students to construct their own plants and motivates them to preserve natural resources.

BUILDING INSPECTION PROGRAM – TOOLS FOR BUILT HERITAGE MAINTENANCE

Mauricio Noya, Ana Lucia Torres Seroa da Motta, Wagner Gomes de Abreu, Mariangela Moura

This research is about Building Inspection, Building Maintenance and Technical Standard Inspection. It also analyzes the effectiveness of the technical standards that support the services of building maintenance. This research has shown that although building inspection is consolidated as a building maintenance tool, it is not

mentioned by ABNT standard 5674. The research confirmed that most of the managers do not prepare a building maintenance plan and do not use building inspection as a tool for building maintenance, leading the buildings to the precocious obsolescence of building elements. This research presents a case study of a building inspection method, applied to a residential building which demonstrates effectiveness, and proved to be a consensus tool towards the inspection building practice. This method guides the managers across the interventions required by building maintenance. It aims at preserving the building life span and its constructive elements.

AWARENESS AND TRAINING: IDENTIFICATION OF RELEVANT SECURITY SKILLS AND COMPETENCIES

Joni A. Amorim, Edgar T. Yano, Rose-Mharie Åhlfeldt, Sten F. Andler, Per M. Gustavsson

In order to identify needed skills and competencies for privacy and security, we propose a systematic process that maps privacy and security threats to related controls that are required to prevent, detect or remove such threats. This work suggests how to apply the process, while discussing how games and simulations can be used both to develop the desired behavior and to monitor the current competency level.

AUTOMATIC GUIDED VEHICLE SIMULATION: USING PARTICIPATORY LEARNING AND GENETIC ALGORITHMS

Anibal T. Azevedo, Joni A. Amorim, Per M. Gustavsson

This paper discusses a framework that uses computational simulation to improve the performance of unmanned aerial vehicles through the creation and the selection of better navigation rules. For such task, the approaches known as Participatory Learning System and as Genetic Algorithm will be combined. The intent is to provide the mathematical and computational structure to enable unmanned aerial vehicle learning from simulation experiences.

COMPUTATIONAL TOOL FOR AUTOMATIC DESCRIPTION OF TIM AND NCAP (IEEE STD. 1451) SPECIFIED IN XML AT HIGH LEVEL OF ABSTRACTION AS FINITE STATE MACHINE

Tiago da Silva Almeida, Alexandre César Rodrigues da Silva, Daniel J. B. S. Sampaio

Advances in the development of new design methodologies and new algorithms have led to the emergence more complex electronic circuits. For this is required computational tools more complex and accurate to create electronic circuit designs. Thus, this paper presents a new methodology based in computational tool for automatic conversion of visual representation of finite state machines for textual representation. The finite state machine is modeled in Stateflow environment and converted to XML description following the SCXML specifications. As a case study was implemented and simulated at high level of abstraction four finite state machines, two ones of TIM and two ones of NCAP, all of them are based on IEEE std. 1451. The experimental results showed that the proposed tool generates a faithful description in XML. Which it has a great applicability in the documentation and synthesis of dedicated hardware for exchange information between NCAP and TIM its own IEEE std. 1451.

TECHNICAL SESSION PT1A

O PAPEL DO TUTOR NO DESENVOLVIMENTO DO PENSAMENTO CRÍTICO E RESOLUÇÃO DE PROBLEMAS

Rosa Vasconcelos, Magda O. Pinheiro, Luis Amaral

The School of Engineering of the University of Minho adapted to the requirements of the Bologna Process through various measures. Among these, the adoption of the methodology of teaching and learning Project-Led Engineering Education is to be highlighted, where the active role of the learner and the tutor's role as "guide" throughout the project is promoted and appreciated. In order to understand whether the role of the tutor is being performed as expected, a series of questionnaire surveys were conducted. In this study instrument, issues within the perception of students on the role of the tutor in Project-Led Engineering Education, on the promotion of critical thinking and on the appreciation of problem solving were addressed.

INFORMAÇÃO, CIÊNCIA E TECNOLOGIA DEMANDA POR NOVOS PERFIS PROFISSIONAIS

Francisco Carlos Paletta, Edison Puig Maldonado

The recent developments of the so called emerging nations have been often grounded in new consensuses, with valuation of democratic access of information and fostering innovation. Stands out the importance of education as a tool associated with the promotion of economic growth, wealth generation and income distribution. In the context of Information Science, Library Science, Archival Science, Museology, and related areas, revisions of pedagogical projects are imposed due to new demands for professionals with multidisciplinary skills, understanding and ease to deal with technology tools, without geopolitical limitations, and with cultural diversity. The egress of these programs must be prepared to act in strategic sectors of modern society: production, education and research..

A ROBÓTICA COMO MEIO DE INTEGRAÇÃO DE CONHECIMENTOS TEÓRICOS E PRÁTICOS

Paulo Henrique Cruz Pereira, Juliano Coêlho Miranda, Janize Pereira Firmiano

Currently , it is believed that technical skills should be associated with the ability to judge , communicate ideas , group work and negotiate decisions collectively . In this context , the exact science courses at the technical level , undergraduate or graduate , have increasingly increased their pedagogical projects of education in order to keep up their courses , faculty and student body motivated . Thus , this paper presents a study in technical courses midlevel professional , how to participate in the Olympiad Robotics - OBR promotes integrating theoretical classroom and practical application . Motivating the student body for independent studies (knowing how to learn and develop) , develop their creativity in solving problems and thus keep you motivated through the course in which they are inserted , motivating the faculty to do research and recycling of knowledge , further promoting the development of all related to the educational institution in which they are part.

EVOLUÇÃO CONCEITUAL DE ESTUDANTES DE ENGENHARIA: A CONSTRUÇÃO DE CONCEPÇÕES SOBRE “SUBSTÂNCIA QUÍMICA”

Suely de Medeiros Onofrio Gama, Tomás Noel Herrera Vasconcelos

This paper aims to identify the conceptions of engineering students on the concept of substance, in order to give a possible change of the same and their use in the teaching and learning of chemistry. The development of chemistry is closely related to chemical concepts and issues related to them. We sought to achieve the integration of curricula of different educational levels, putting engineering in a central position in the organization of this knowledge, since it, there is a need for a creative and practical application of a range of scientific principles closely linked to materials science.

AVALIAÇÃO DO USO DO WEBFÓLIO NO ESTÁGIO SUPERVISIONADO DO CURSO DE PEDAGOGIA

Évellyn Silva de Santana, Dáfny de Souza Macedo, Onília Cristina de Souza de Almeida

The main objective of this article, which resulted ¬out of research that was conducted for a senior thesis project, was to identify Pedagogy students’ reactions to the use of Blog as a tool for publishing activities related to their supervised internships at the IESB University Center in Brasilia. Thirty-eight students participated in the study, which was qualitative and descriptive in nature. Netnography was conducted by way of postings on the discussion boards within the virtual learning environment - Blackboard. Data was handled using the content analysis technique, which pointed out a) positive satisfaction in adopting the virtual format (Blog), b) greater interaction between participants, and c) appropriation of the use of information and communication technology in teacher training for a more innovative practice. The results, therefore, showed a positive response to the adoption of Blog for recording academic information and can contribute toward improving the quality of teaching and learning done by students.

REDES INTERORGANIZACIONAIS: REVISÃO BIBLIOGRÁFICA DE 2000 A 2013

Onília Cristina de Souza de Almeida

This article presents an overview of the theoretical and conceptual aspects involving inter-organizational networks as a theme. It consists of a qualitative approach, and as such, a literature review of journals indexed within the CAPES databases between the years 2000 and 2013 was conducted. The sample consisted of 32 (thirty two) scientific articles, noting that articles about networks are largely concentrated in business publications. However, this survey revealed a growing interest in inter-organizational networks as a theme, in different contexts in which it is inserted. What stands out is that, in recent years, this type of organizational alliance has become a strategic option at the corporate level, aimed at complementing competencies and gaining a competitive advantage.

PRÁTICAS EXPERIMENTAIS NO ENSINO À DISTÂNCIA E NA PESQUISA COORPORATIVA EM ENGENHARIA ELÉTRICA

Luis Carlos Origa de Oliveira, Érica Vasconcelos de Morais, Rodrigo N. de Oliveira, Luiz Fernando Bovolato

Until late 80s, three distinct phases in the evolution of experimental Electrical Engineering laboratories are identified. The third evolution phase, marked by the great insertion of digital equipment and intensive use of the Internet, made the use of experimental labs with remote access a viable possibility. The functional characteristics of this new kind of experimental laboratory led to dramatic advances in distance learning activities, as well as in experimental corporative research involving highly costly equipment. At this work, the historical evolution of experimental laboratories, focused in electrical engineering, with a view to shared use through web, is discussed. The integration of this technology in different segments of teaching and research are also discussed, particularly, the use of the Power Quality Remote Laboratory and its potential in teaching and research activities is shown as example.

TECHNICAL SESSION PT1B

ESTUDO DA ACEITABILIDADE DE USUÁRIOS SOBRE O USO DO WIIMOTE COMO INTERFACE DE UM CURSOR 3D

Roberto Scalco, Shin-Ting Wu

Aiming at the application of Wiimote as a 3D cursor controller for accurate spatial placements, this article presents an analysis of test results of motion tracking objects and a survey with users who used the control Wiimote of the Nintendo Wii to move a 3D cursor. The time to perform the tasks and the difference between the object position and the position of the target were used to determine the characteristics of a learning curve of the pointing and motion tracking objects with the Wiimote. The survey results allow to confirm, from the previous experience of the users, such as familiarity with the use of Wiimote, experience with 3d modeling softwares or familiarity with 3D games, the points that should be improved in the proposal of this framework

UMA EXPERIÊNCIA EM IMPLEMENTAÇÃO DE LABORATÓRIO DE ENSINO DE AUTOMAÇÃO DE PROCESSOS INDUSTRIAIS

Jean Marcos de Souza Ribeiro, José Paulo Fernandes Garcia

This text describes an experience obtained in the implantation of a teaching laboratory, together with a discipline, of focus eminently practical, addressed for the area of automation of processes. It is emphasized as main element the creation of conditions that propitiate to the students motivation for construction of projects of processes control. The main tool used at the laboratory to make possible the projects of processes control is the Programmable Logical Controller (PLC). The processes done at laboratory are controlled through net of PLC's and can be monitor

CONSTRUÇÃO, MODELAGEM E CONTROLE, ATRAVÉS DE CLP, DE UMA PLANTA DIDÁTICA DO SISTEMA PÊNDULO INVERTIDO, COM UTILIZAÇÃO DE SOFTWARE SCADA

Jean Marcos de Souza Ribeiro, Edilson Alfredo da Silva, Marcelo Carvalho Minhoto Teixeira, José Paulo Fernandes Garcia, Wallysonn Alves de Souza, Ariel Starke Buzetti

The aim of their paper was to build a low cost inverted pendulum system with parts of dot matrix printers, for the study of control systems. After that, a linear mathematical modeling of this system was deducted. Then, based on experiments at the laboratory, including the frequency response, the transfer functions of the inverted pendulum were obtained. Considering their transfer functions and supposing that the state vector is available, a controller was designed based on the pole placement control design method. The designed controller was implemented in an Programmable Logic Controller (PLC) and was used an software SCADA. This study can be useful in didactic applications, because the proposed procedure presents low cost and their devices (PLC) and software (SCADA) are broadly use in industries.

ANÁLISE DO CONSUMO DE COMBUSTÍVEL DE UM GERADOR DIESEL ALIMENTANDO CARGAS LINEARES E CARGAS NÃO LINEARES

Alexandro Pastick de Carvalho, Ruben Barros Godoy, Fabiano Breschi, João Onofre Pereira Pinto

This paper proposes an analyse of fuel consumption in Diesel generator - GD with actuation primary machine of kind Internal Combustion Engine – ICE cycle Diesel. So, are essayed two types of distincts loads and both of 2 kW. The first is a Linear Load thats response signal is proportional to exciting signal; the second Load is Non-Linear Load thats response presents a distortion related to excitement entrance signal. The Linear Load was equipped with a non-controlled triphasic rectifier with inductive and capacitive filter in the output, also knows that LC filter. In the final is possible assess if the fuel consumption of GD changes to these loads. Therefore, during the essays the levels of voltage and aceleration of GD was sastifieds allowing compare the loads. A proportional control was implemented in the system acceleration of MCI, which enabled GD maintain voltage between 127 V to 130 V.

PERCEPÇÕES SOBRE O CERRADO ENCONTRADAS EM GRADUANDOS EM ENGENHARIAS DA UNIVERSIDADE ESTADUAL PAULISTA DE BAURU

Maria do Carmo Jampaulo Plácido Palhaci, Luiz Roberto Vasques Hellmeister, Talitha Plácido Palhaci, Carmem Francisca Hellmeister

When we discuss environmental issues , research shows that individuals do not seem to present a genuine perception of the natural environment , which can be justified by the current context of modernity , in which the contact of many people with a natural environment is scarce and in front of this, build a perception of environment through intermediaries , such as classes , books , magazines or television . The Universidade Estadual Paulista Júlio de Mesquita Filho , located in Bauru - SP , allows its goers a direct contact with the Cerrado , since part of this biome reserve is located in the institution . This paper reports a research on perceptions related to the Cerrado , conducted with students of the first and last year of Graduation in Engineering . The aim was to investigate whether there are differences in perceptions found in beginners and senior students who attended about five years of disciplines on a campus present in the Cerrado area .

EDUCAÇÃO E TECNOLOGIA: UMA NOVA FORMA DE ENSINAR E APRENDER

Iara Moreira Jardim

Improvements in the way of teaching and learning, especially in distance education, promote reflections on the impacts of this type of education regarding teaching practices. The issue has been addressed by researchers and educators so that the technologies related to communication and information processing have been improved. The whole discussion gains strength and is supported by the educational context of the current digital moment in which we live. There is a consensus among educators that there are restrictions on the use of technologies as tools and these tools are tied to a set of behaviors and rules of coexistence, which should be defined according to the proposed learning objectives and expectations. This article seeks to develop element analysis on some didactic pedagogical tools which could promote interaction between students, teachers and society.

WEBAULA: O CAMPUS VIRTUAL DA ESTÁCIO E AS INOVAÇÕES METODOLÓGIAS DE ENSINO-APRENDIZAGEM

Maria Tereza Ettinger de Oliveira, Hortência de Abreu Gonçalves, Zênia de Oliveira Nascimento

Estacio de Sa University through the Virtual Learning Environment technology tool WebAula LMS (Learning Management System) for distance learning (DL) provides exercises, courseware and online content directly from the studios located in Rio de Janeiro to all its sites. Distance Education Project in Estacio is part of the institutional mission, promoting modern education in harmony with the interests of students and society, following the educational trends and new educational paradigms of innovative teaching. This study aimed to verify the Virtual Campus Estacio and its teaching- learning space for communication, information and cooperation that provides students with educational services focused on Technological Undergraduate and Graduate online courses. In the Virtual Campus Estacio, through interaction, immersion and navigation, the student develops skills and expertise, allowing him to explore environments, processes and objects with the purpose of knowledge construction.

TECHNICAL SESSION PT2A

INTRODUÇÃO DE DISCIPLINA DE CUNHO CULTURAL EM UM CURSO TECNOLÓGICO DE ENGENHARIA MECÂNICA DA UFMG

Danilo Amaral

This paper presents a description of the experience of introducing the discipline of cultural stamp on a technological course of Mechanical Engineering, UFMG - Universidade Federal de Minas Gerais, offered by teacher's own Department of Mechanical Engineering. Unlike elective courses offered by the Faculty of Humanities of the University itself, it originates in the Faculty of Technology and aims to humanize and make more creative engineer. Is shown how the discipline of "History of Mechanics" is taught, the form of assessment, as it was received and evaluated by the students themselves, what was the impact on the course and what are the advantages of offering such discipline.

A UTILIZAÇÃO DE SIMULADORES COMPUTACIONAIS NO ENSINO DE FÍSICA PARA CURSOS DE ENGENHARIA

Leonardo André Testoni, Silvia Maria de Paula, Fulvio Bianco Prevot

This paper aims to analyze the use of computer simulations in physics teaching for basic cycles of engineering courses, highlighting their character trigger and instigator of discussions and debates, as well as its contribution to a process of teaching and learning based on scientific literacy. The simulators used, called applets, are made up of closed programs that have specific task, previously scheduled, allowing representations of physical situations that seldom be able to be reworked in a conventional laboratory class. The research was conducted in a class of 1st year engineering at a private university in São Paulo and the data obtained through the transcription of audio recordings and video lessons observed. As a benchmark analysis used the standard model argumentative Stephen Toulmin, enabling the identification and development of standards argumentative discussions in small groups.

UM PROJETO INTERDISCIPLINAR NO CURSO DE ENGENHARIA DE CONTROLE E AUTOMAÇÃO

Bene Régis Figueiredo, Tatiane Policário Chagas Amorim

This paper aims to report the academic experience of the teachers of the Course Control Engineering and Automation in interdisciplinary activities. Awaken the student to the process of learning theoretical and practical characteristic of professional reality. Create a culture of "learning to learn". Teaching activities involving the disciplines of electrical circuits and electronics led to technical debates, discussions, exercises, labs and presentations of practical applications. The results are breaks barriers between disciplines and construction of the link between knowledge of various areas of engineering. Consolidating learning in projects with practical

applications, both in academia and in professional activities for the future engineer. This experience reflected in subsequent periods of the course, as the student begins to manipulate information fragmented to transform them into new knowledge, reflecting the maturity to integrate information from each discipline.

CONTROLADOR FUZZY APLICADO EM AR CONDICIONADO AUTOMOTIVO

Fabiano Breschi, Luciana C. Leite, Edson A. Batista, Alexandro Pastick de Carvalho

The objective of this paper is to use the tool of fuzzy logic to optimize the use of vehicle air conditioning system (VACS). This system has the function of improving the distribution of air conditioning ventilation for the vehicle´s occupants, as well as reducing fuel consumption through a fuzzy controller developed in a microcontroller. The controller implemented in the dsPIC plate will have temperature sensors, and infrared switch, and pressure switch as input signals. As output signal it will have the control of time of compressor drive in order to maintain a comfortable temperature inside the vehicle, depending on the number of occupants, thus reducing the torque exerted on the engine and increasing the electrical system and generator longevity. The system was simulated in the fuzzy logic toolbox of MATLAB and the results were satisfactory, significantly reducing the compressor´s time of use.

A IDENTIDADE NO ENSINO A DISTÂNCIA: A CERTEZA DO CLICK SEGURO PELO VERDADEIRO AUTOR

Alexandre S. Matos, Hortência de Abreu Gonçalves, Maria Tereza Ettinger de Oliveira, Zênia de Oliveira Nascimento

Among the available technologies of security, the electronic certification or virtual identity, developed from cryptography, allows the unequivocal identification of an author of a message made in electronic means, which guarantees authenticity, confidentiality and integrity. In distance education, the use of digital certification from Brazil ICP's model by students and tutors promotes more safety to the system in conducting the face-to-face evaluation and/or the access to a network with digital certificate, avoiding frauds in official documents, as ID card or driver's license. This essay aimed to verify the inclusion of digital certificate in virtual environment of learning, the adequacy and operation of this technology. The digital certificate keeps the user's responsibilities, the details of the security policy, which is created and signed by a certifying authority that guarantees the inviolability of the sent content, offering several services with more agility, facility in access and substantial costs reduction.

ENSINO DE FÍSICA EM CURSOS DE ENGENHARIA E ATIVIDADES PRÁTICAS SUPERVISIONADAS: UMA PROPOSTA DE ENSINO BASEADA NA APRENDIZAGEM POR DESAFIO

Pedro José Gabriel Ferreira, Leonardo André Testoni, Túlio Cearamicoli Vivaldini, Iara Batista de Lima, Thais Cavalheri dos Santos, Lilian Nunes Pereira, Alexandre Frugoli

Experimental practices concerning the physics education are well-established methodologies which support the development of scientific thinking skills in the university environment. In the last years this subject is increasingly recurring for researches at many grade levels. In order to provide an initial contact of the students with practical issues, relating the fundamentals concepts studied during the basic cycle of Engineering graduation - which covers the first two years of the course - the development of a specific project is proposed each semester by means of the Supervised Practical Activities (SPA or APS in Portuguese).The aim of these activities is to offer an environment for the student cognitive evolution, by proposing legitimate challenges , focusing on teamwork as a key factor for its development. In the present work the activities performed with the undergraduate students of Universidade Paulista (São Paulo/Brazil) during the last years are shown.

BARREIRAS NO USO DA TIC NA PRÁTICA DOCENTE – ANÁLISE DE RELATÓRIOS NACIONAIS E INTERNACIONAIS

Vera Rejane Niedersberg Schuhmacher, José de Pinho Alves Filho

The results presented in this article are part of a study on the development , which seeks to account for the investigation of the barriers faced by teachers in the process of integration of ICT curriculum and its genesis . The

use of ICT in education has been consolidated as a new field of science , the concept brings the idea of plurality through a critical exchange between different knowledge . But its use in the school environment is still shy , the results of different studies around the world have shown that this scenario is partly due to the barriers perceived by teachers and school managers . This article brings international experience reports about ICT in teaching and analyzes in national publications that have reported cases of insertion of ICTs in Brazilian schools , in which we seek to identify the barriers that hinder or even prevent the inclusion of ICT in practice teaching .

TECHNICAL SESSION PT2B

FORMAÇÃO DE ENGENHEIROS DE SISTEMAS NO BRASIL: USO ESTRATÉGICO DE PROBLEMAS EM ABERTO

Eneida Pereira dos Santos, Frederico Gadelha Guimarães, Ricardo Luiz Adriano, Ana Liddy Cenni de Castro Magalhães, Luciana Moro, Eduardo Fleury Mortimer

Since the mid-twentieth century changes in technology paradigms initiated global transformations with unprecedented possibilities and challenges, in which engineering has a major role. However, this field faces the challenges of high indices of evasion and failure and low levels of entrepreneurship and innovation in students. Open-ended problems might be a strategical didactic activity to tackle this. Instructors should utilize this in their teaching practice, even though they were not taught like this. In reporting this experience, within the context of implementation of project laboratories in a pioneer undergraduate program funded by Brazilian REUNI/MEC – systems engineering at UFMG -, we present how instructors have evaluated their experience in the use of open-ended problems in the second module of these laboratories. They learn how to utilize this resource during their practice, illuminating it by the experience in the research field, despite not finding support in their experience as students

AVALIAÇÃO DE INCERTEZA DE MEDIÇÃO NA DETERMINAÇÃO DE INTERFERENTES ENDÓCRINOS EM ÁGUA SUPERFICIAL POR CROMATOGRAFIA GASOSA COM DETECÇÃO POR ESPECTROMETRIA DE MASSAS

Elaine Arantes Jardim Martins, Helio Akira Furusawa, Juliana Ikebe Otomo, Renata Rodrigues de Souza, Caroline Lima de Oliveira, Marycel Elena Barboza Cotrim, Maria Aparecida Faustino Pires

The uncertainty was estimated for the determination of some endocrines disruptors content in superficial water using gas chromatography with mass spectrometry detection. The endocrine disruptors were extracted from superficial water by solid-phase extraction procedures, derivatisation and quantification by GC/MS. In the estimation of uncertainty, sample processing and chromatographic determination that may significantly influence the uncertainty of analytical data were considered. The results show that the method recovery and matrix-matched calibration are the two main contributors to uncertainty. The method has a relative expanded uncertainty (coverage factor k = 2,447 for 6 degrees of freedom at a 95% confidence level) of about 8 to 19% and endocrine disruptors content of approximately 4 ng.mL-1 to 2 µg.mL-1, depending on the compound.

LÓGICA FUZZY E DISPOSITIVOS LÓGICOS PROGRAMAVÉIS APLICADOS NO CONTROLE DE ROBÔS

Jean Rafael Camillo, Suely Cunha Amaro Mantovani

This work is applied to the issue of robot navigation, with the proposal to provide a solution among several found in the literature to control the movements of a prototype of a mobile robot using the concept of fuzzy logic and hardware description language, Verilog. The control algorithm is implemented on a development board, DE2, ALTERA, containing programmable logic devices, which allow its reconfiguration using the software development from the same manufacturer, the Quartus II. Overcome this problem of locomotion is an important task for the automation of various activities, such as loading and unloading, mobility aid, among others. The project aims to provide a solution for automated locomotion of a robot in an unknown environment in which its avoids obstacles using a fuzzy logic controller and three distance sensors order to control two DC motors using PWM pulses.

EDUCAÇÃO CONTINUADA EM ENGENHARIA PARA A QUALIFICAÇÃO PROFISSIONAL: O PROGRAMA DE INDICADORES DE DESEMPENHO DE TECNOLOGIAS CONSTRUTIVAS DA COMUNIDADE DA CONSTRUÇÃO

Alberto Casado Lordsleem Jr., Suenne Andressa Correia Pinho

Continuing education for professional qualifications is responsible for improving skills to meet the current challenges of the world, is an important complement to the formal education of engineers. Professional qualifications are attributes obtained by individuals to the development or improvement of skills in order to better carry out their tasks. In this context, the Construction Community of Recife city in Brazil, coordinated by the Brazilian Association of Portland Cement - ABCP, promoted with professionals of the construction companies the indicators program of construction technologies based on cement or PROGRIDE. This work aims to show the development and implementation of PROGRIDE. The methodology considered the establishment of standard indicators, program implementation and analysis of results. As a contribution, emphasize the dissemination of knowledge for engineers who form the Construction Community and the creation of a collaborative environment among the companies participating in this initiative.

ORGANIZAÇÃO CURRICULAR E OS EIXOS ESTRUTURANTES UMA PERSPECTIVA DE FORMAÇÃO NA ENGENHARIA DE COMPUTAÇÃO

Abiezer A. Fernandes, Mara Lúcia Castilho, Ilma Passos A. Veiga

This study presents the basis for structuring a course curriculum for the Computing Engineering at the Centro Universitário de Brasília (UniCEUB), in Brasília, Brazil. The curriculum foundation are interdisciplinary subject areas that intersect several course disciplines, and standardized testing that identifies the progression of knowledge acquisition by students through their academic life. These subject areas aid in the definition of subject matters broached along the course disciplines, orient the development of knowledge, competencies and abilities necessary in preparing an Engineer for his or her professional life, and orient the establishment of objectives for each component of the course curriculum. This structure promotes the development of interdisciplinary educational activities, dialog between course disciplines and the development of interdisciplinary knowledge evaluations. Furthermore, these common subject areas promote a close cooperation between traditional in class learning, extension activities and academic research, consequently, the creation of scientific, technological and experiential knowledge in Computing Engineering.

METODOLOGIA PARA DETERMINAÇÃO DE COCAÍNA E BENZOILECGONINA EM ÁGUAS SUPERFICIAIS

Helena Miho Shihomatsu, Elaine Arantes Jardim Martins, Marycel Elena Barboza Cotrim, Daniel Temponi Lebre, Maria Aparecida Faustino Pires

An analytical method for the determination of cocaine (COC) and benzoilecgonine (BEZ) in surface waters has been developed and validated. The method is based on extraction and purification of target compounds by solid phase extraction (SPE) followed by liquid chromatography reversed phase coupled to a tandem mass spectrometer (LC-MS/MS). Quantitative analysis was performed in a MRM (Multiple Reaction Monitoring) mode. For each analyte, two transitions between the precursor ions and ions two most abundant products were monitored; the most abundant one used for the quantitation and the other one for confirmation. Average matrix spike recoveries at three different spiking levels were 77-102 % for COC and 73-91 % for BEZ. The method quantitation limit (MQL) was 3 ng L-1 for COC and 1.2 ng L-1 for BEZ. The developed method has been applied to the analysis in the waters of public supply Guarapiranga Dam (SP, Brazil).

ELABORAÇÃO CRIATIVA DE PROJETOS COM ESTUDANTES DE ENGENHARIA VISANDO O ESPÍRITO EMPREENDEDOR

Angelo E. B. Marques, Mairlos Navarro, Angelo S. Zanini, Julio C. Lucchi

The practice of professional education requires constant reflection on the part of higher education institutions, with regard to society's needs and the profile of students graduating. The engineering of the XXI century brings to light the need for a professional who, in addition to sound technical knowledge, be creative, communicative, ethical and

entrepreneur. These aspects related to professional engineer makes traditional curricula, focused only on technical knowledge, need to be revised. Aware of these issues, the Faculty of Exact Sciences and Technology, University São Judas Tadeu performs actions to modernize their educational process. Among these measures is the adoption of a conceptual structuring of new products and services (developed by Bill Verplank - Stanford) since first grade, encourage students to work creative ideas with an entrepreneurial spirit.

TECHNICAL SESSION PT2C

GESTAO DO CONHECIMENTO: O USO DO PROGRAMA UCINET 6.0 COMO SISTEMA DE INFORMACAO PARA IDENTIFICAR MUDANCAS ORGANIZACIONAIS NAS PMEs

Claudio Lira Meirelles, Jose Benedito Sacomano, Renato Telles, João Paulo Lara Siqueira

The research objective is to construct an exploratory prospect of using UCINET 6.0 software as a tool to create an information system of informal networks intra-organizational in Small and Medium firm. Given the difficulties of small and medium firms to adapt to rapid changes in the global scenario, it has become imperative to develop new strategies to build competitive advantage and an efficient information can directly impact the competitiveness. The research used a cross-sectional descriptive quantitative method and survey. From the data collected in the interviews and shot in UCINET 6.0 software, graphs and tables which confirmed clearly as networks of actors come together, identifying the connectivity between them and the central actors, and what changes have occurred in this structure were generated in the period one year in

FERRAMENTAS NO ENSINO A DISTÂNCIA

Clinton Duarte Lima, Demétrio Renó Magalhães

As new information technologies are created the most diverse sectors benefit, enjoying them to deliver better services. Soon there was an interest in researching free tools that assist in the development of distance courses and to enable the planning of better and more attractive courses, benefiting learning. In research were identified several tools that were classified as online or offline. Once classified, they were compared, taking into account criteria such as, diversity of activities, efficiency of use, simplicity of learning, facility of storage, portability and some other properties related to usability, perceiving a great difference among them in various aspects evaluated

PROGRAMAS DE ENGENHARIA CIVIL NA UFV: CURRÍCULOS DOS CURSOS DE GRADUAÇÃO E DE PÓS-GRADUAÇÃO E EXPERIÊNCIAS DE ENSINO

Dario Cardoso de Lima, José Carlos Bohnenberger, Eduardo Antônio Gomes Marques, Paulo Sérgio de Almeida Barbosa

This paper addresses a vision of undergraduate and graduate civil engineering programs at the Federal University of Viçosa, located in the State of Minas Gerais, Brazil. Aspects of school curricula, the importance of the evaluation of the teaching-learning process on a regular basis, as well as the advantages and benefits of integration of undergraduate and graduate programs from the perspective of the training of undergraduate students in research are emphasized

PROJETO, IMPLEMENTAÇÃO E TESTES DE UM MÓDULO DIDÁTICO DE 1 KVA, PARA A CONEXÃO SCOTT, CONEXÕES TRIFÁSICA - BIFÁSICA E TRIFÁSICA - TETRAFÁSICA

Francisco Carlos V. Malange, Falcondes José M. de Seixas, Henrique Gon Pereira

The present work proposes the design and development of a didactic Scott transformer where all mains windings are available. This presents the mathematical equations that describe the behavior of the module and its fasorial analysis for 3Φ-2Φ, 2Φ-3Φ and 3Φ-4Φ conversion. Winding indutances and output voltages obtained by experimental tests are compared to digital simulations with the OrCAD/PSpice tool, Schematics. Practical

experiments are planned to prove 3Φ-2Φ conversion, efficiency curve, regulation and the possibility of starting a single-phase induction motor without capacitors.

PROJETO IMPLEMENTAÇÃO E APLICAÇÃO PRÁTICA DE UM MODULO DIDÁTICO DE UM DISPOSITIVO ELETROMECANICO POR AÇÃO DE CORRENTES INDUZIDAS NA CLASSIFICAÇÃO FREIO DE FOUCAULT

Francisco Carlos V. Malange, Falcondes José M. de Seixas, Edson Campos Casonato

The control of the intensity of the load is basic to know the characteristics of the electric engines in diverse levels of requirement (electric and mechanics), understood in the region of nominal operation of the electric engines. The measures of power include the absorption and/or the generation of conjugated, being that the conjugated one in rule ways is determined by the forces of reaction in a rotating part and a stationary part [1]. Had to the raised cost of the equipment used in assays of engines, such as dynamometers, generators and dedicated interfaces for gauging of conjugated, you consider in this work the project, the implementation and the practical application of a composed didactic module for a device electromechanical, for induced chain action, capable to impose load adjustable mechanics, without necessity of direct measures of conjugated. Also the results of the practical application will be presented of modulate it in an three-phase engine of induction of 2 cv.

MOTOR LINEAR DE INDUÇÃO BIFÁSICO: CONSTRUÇÃO DE UM PROTÓTIPO CONTROLADO POR INVERSOR DE FREQUÊNCIA

Falcondes José M. de Seixas, Francisco Carlos V. Malange, Claudiner M. Seixas, Marcel Benetti, Priscila da Silva Oliveira

The linear motor is used in many areas, especially in the transportation field, like the high speed trains. This paper presents a complementary study, design and experimentation of an existent two-phase linear induction motor. It was performed the prototype improvement and installation of end-course sensors as well as the design of a new secondary (car), the speed control through frequency inverter and a breaking system and speed reversion. In this work, were developed all of the electrical motor concepts, using the parameters of two-phase rotating motor, applied to the Linear Induction Motor feed by a Scott transformer. The results show the performance of the prototype using the programmable frequency inverter to allow speed control and reversion employing two magnetic sensors.

OBJETOS DE APRENDIZAGEM (AO): CONTRIBUIÇÕES AO ENSINO DE METODOLOGIA CIENTÍFICA ONLINE

Hortência de Abreu Gonçalves

Learning objects are educational activities that can address content of a discipline, through electronic games that overlap playfulness, interactivity, logic and creativity. The objective is to propose online learning objects for Scientific Methodology discipline from Distance Learning Centers from Universidade Tiradentes -UNIT (State of Sergipe) , Faculdade Integrada Tiradentes- FITs (State of Alagoas) and Faculdade Integrada de Pernambuco (FACIPE), Brazil . The research included publications between 2007 and 2013. With learning objects in educational environment, playfulness became part of the virtual classroom and teaching process took different perspectives. This paradigm change encouraged the student to understand addressed content. Learning Objects include logical reasoning, molding of the thought in monitoring proposed situations and the predominance of the proposed line of reasoning, enabling an interactive and playful learning with emphasis on logical and shown argument.

TECHNICAL SESSION PT3A

DESENVOLVIMENTO DE UMA ESTAÇÃO METEOROLÓGICA ACOPLADA A SINALIZAÇÃO AÉREA

Roberto Scalco, Alessandro Guilherme de Freitas, Bruna Ariane Alenso Teixeira, Marina Manzato Pretolini, Riccardo Luigi Delai

Harsh climatic conditions and lack of infrastructure are factors that can cause major disasters. Daily reports are made about floods and landslides due to rains affecting the cities during certain months of the year. This paper describes the development of a weather station that collects data regarding the relative humidity, atmospheric pressure and temperature. The station has a GPS that determinates location and data, transmitted through the Internet, using a GSM module. It is small sized and is designed to be coupled in beacons used to assist in aerial navigation. Thus, it is possible to improve the spatial resolution in data collection taking advantage of the high concentration of these flags. The data are transmitted to a server and can be used to generate weather forecasts more accurately, and generate information for mobilizing rescue teams warning them about critical points

LABORATÓRIOS MULTIDISCIPLINARES EM CONCEITO DE EIXOS ESTRUTURANTES COMO AGENTES DE TRANSFORMAÇÃO NA ENGENHARIA

Abiezer A. Fernandes, Mara Lúcia Castilho, Magda V. Carvalho Branco Silva

This paper presents the results achieved through the implementation of a course curriculum based on interdisciplinary subject areas for the Computing Engineering at the Centro Universitário de Brasília (UniCEUB), in Brasília, Brazil. The results were observed in practice-centric activities in classrooms, more specific the research activities conducted in multidisciplinary learning spaces designed to optimize use of infrastructure and human resources. The activities were implemented through experimentation protocols, and explored student's motor skills, cognition, and analysis capabilities. The course curriculum structure presents students with activities that bridge the gap between theory and practice, and encourage active student participation. The curriculum has allowed teachers to implement innovative teaching techniques, creating a strong academic foundation for the students of this Engineering program.

A UTILIZAÇÃO DA ARGUMENTAÇÃO NO PROCESSO DE FORMAÇÃO DE ENGENHEIROS EM UM CONTEXTO DE FÍSICA MODERNA E CONTEMPORÂNEA

Marina Valentim Barros, Juliana Capanema Mendonça

The following work presents the use of argumentative resources for students of Chemical Engineering through letters, which defends the use of nuclear energy, produced by them in the last period of the course. The students were participating in the compulsory subject of Advanced Topics in Nuclear Engineering. They are asked to draft letters to present arguments that defended the use of nuclear energy, after being presented to the technical content in the introductory course. This subject is presented differently from traditional lecture courses in engineering with the active participation of students in the context of curriculum innovation, as it addresses content of modern physics so scarce in current engineering courses. These letters that present arguments constructed by students can contribute to the enrichment and training for a stronger and more aware of these future engineers.

AMBIENTE DE APRENDIZAGEM PARA A AQUISIÇÃO DE COMPETÊNCIAS NA ÁREA CIENTÍFICA DE ENGENHARIA ELETROTÉCNICA BASEADO NUM SISTEMA DE REALIDADE VIRTUAL

M. M. Travassos Valdez, C. Machado Ferreira, F. P. Maciel Barbosa

The new technologies make it possible to create labs in a virtual environment resorting to 3D models, presenting contents rich in information for educational purposes. The use of relevant educational theories in 3D environments is not enough unless experimental practices are included in the learning context. Studies have identified the relationship of students' behavior with learning activities in 3D environments. A model based on a multimedia design was developed for this project. The model consisted in three stages: analysis, project and assessment. A 3D prototype was created based on theoretical model and pedagogical approaches. The assessment showed that devising experiments with a rich multimedia format has the potential to enable students to learn more efficiently. The pedagogical approaches gave students the adequate incentive, leading to a deeper involvement with the contents and, ultimately, to a better learning. This paper presents the design of a VR prototype, VEMA (Virtual Electric MAnual).

ESTUDO DE VIABILIDADE ECONÓMICA E ENERGÉTICA DE ILUMINAÇÃO EFICIENTE COM TECNOLOGIA LED

Filipe M.M. Raminhos, M. M. Travassos Valdez, C. Machado Ferreira

The present study aims at analysing the economic viability of using LED lighting systems combined with the already existing electrical installation in a restaurant area in order to achieve adequate energy efficiency. More and more LED installations are being used in new buildings as well as in renovations of buildings already being used. The type of activity together with the lighting specifications for the restaurant and food sector, the architecture of the location and even the specific requirements put forward by the owner make this type of building a desired target of analysis to achieve energy efficiency. This study will analyse the already existing equipment and the possibility of its replacement by LEDs using a study of energy consumption and the potential of the Dialux lighting calculation program

FENÔMENO EDUCAÇÃO A DISTÂNCIA: O CASO DA UNIVERSIDADE ESTÁCIO DE SÁ

Zênia de Oliveira Nascimento, Hortência de Abreu Gonçalves, Maria Tereza Ettinger de Oliveira

Distance Education (EaD) phenomenon contemplates a technology directed to the profile of Generation Y students that have grown up in the digital world, mostly of them are less than 30 years old, and are not available to attend an undergraduate course. The Academic Information System (SIA) of Estácio de Sá University contemplates an educational model that aims to facilitate the access to information without the need of physical frequency. It uses a teaching language that promotes interactivity and communication from professor to student and from student to teacher; it allows the student flexibility and creativity with emphasis on the construction of knowledge based on critical thought. The platform developed by the institution provides the student the access to video lessons that combine technology with learning and teaching process through material available online and also through chats and forums that give pedagogical support to the contents of disciplines that are offered.

APRENDIZAGEM POR PROJETO: APLICAÇÃO DO LEAN LOGÍSITCA NA ROTINA DOS TRABALHADORES EM UMA EMPRESA DO NOROESTE PAULISTA

Rodrigo Uliana Ferreira, Antônio Ricardo Chiquito, Carlos Magno de Oliveira Valente, Luis Carlos de Souza Carlos

This article describes how to teach employees of a company in the northwest of the state of São Paulo Brazil using techniques of Lean Logistics, as there are many paradigms that need to be broken to achieve success. The methodology presented in this article will be a learning project, where employees learn the theory and practice developing the project for implementation of Lean Logistics, to the accompaniment of a mentor, this methodology makes the employee feel part of the process.

TECHNICAL SESSION PT3B

MONITORAMENTO ELETRÔNICO DE BAIXO CUSTO PARA MENSURAR GRANDEZAS ELÉTRICAS E CONSUMO ENERGÉTICO

Jéssyca Martins de Sena, Judson Cascaes Matos, Larissa Samara Paula de França, Tiago Martins Ribeiro, Rai Carreiro Ferreirra, Fernando Gromiko Helena, Ciro José Egoavil Monteiro, Carlos Alberto Tenório de Carvalho Júnior

O trabalho apresenta o desenvolvimento de um protótipo de monitoramento de grandezas elétricas presente em redes trifásica. O protótipo possibilita a medição de corrente e tensão elétrica, consumo, demanda de energia, temperatura dos condutores e custo final em tempo real. É totalmente baseado no microcontrolador ATmega1280, uma plataforma didática de programação com um kit didático de eletrônica. Além desse microcontrolador, foram utilizados sensores de tensão, corrente elétrica e temperatura, para obtenção de melhores resultado

IMPLEMENTAÇÃO DE UM SISTEMA ELÉTRICO DE PROTEÇÃO DIDÁTICO - SPED

Jéssyca Martins de Sena, José Diogo Forte de Oliveira Luna, Lígia Silvéria Vieira da Silva, Stephanie Santana Pinto, Fernando Gromiko Helena, Ciro José Egoavil Monteiro, Carlos Alberto Tenório de Carvalho Júnior

In this paper we will propose the procedure adopted to build a didactic device, which aims to demonstrate the operation of a didactic electrical protection system (DEPS). The protection system operates through the activation of the equivalent circuit of a digital relay, which uses voltage and current sensors to enable protection through defined settings, that will trigger the relay to deactivate the charge whenever the sensors detect an unexpected operation situation. The protection system uses an ATmega328, because it is a simple microcontroller, didactic and easy to program. The DEPS was built with basic electronic components, that can be easily acquired, which facilitates the replication of the project, allowing the student to get familiar with the concepts of electrical protection system that are addressed in more advanced courses, as soon as he begins his studies in electronics

PROTÓTIPO CONTROLADO POR MEIO DE DISPOSITIVO DE MOVIMENTO EM PLATAFORMA ANDROID: UMA PROPOSTA PARA O ENSINO DE ROBÓTICA EM CURSOS DE ENGENHARIA E TECNOLOGIA

Rafael Peres Serrano, Fernando Rodrigues de Azevedo, Herick Mota, Leonardo André Testoni, Silvia Maria de Paula, Tiago Solci

This paper is aimed to analyze the use of microcontroller prototyping board to assist on engineering and technology courses, engaging students in discussions and debates about its contribution to teaching and learning. The Microcontroller used, Arduino, is often referred as physical computing, as it can interact with the physical world that makes it easy for you to explore. This project is focused on creating a prototype (RC vehicle), which is driven by the microcontroller Arduino Uno Rev 3, loaded with the code that is the bridge between the user and the hardware that communicates through an Android platform interface based on the programming skills of students from the 1st year of computer science at a private university in São Paulo.

MÍDIAS E EDUCAÇÃO: NOVAS TECNOLOGIAS PARA O ENSINO A DISTÂNCIA

Antonina Gallotti Lima Leão, Hortência de Abreu Gonçalves

The technological revolution that marked the beginning of the century, came to break paradigms, changing the way people relate , in its various sectors , including these distance education. In this scenario, higher education has been contemplated with extreme changes caused by the Internet and its endless possibilities. The media support required to operate this type of teaching makes use of tools such as: podcast, chat, vídeoaula, video conferencing, forum, learning objects, among others, and the teaching material available online. The use of media allows interaction and socialization, as it goes beyond the strict limits of classroom education and plastered. This proposed construction of knowledge, the student is encouraged to explore the contents of the subjects with autonomy, enabling critical thinking at the time that integrates multiple skills and competencies essential to their professional training

EDUCAÇÃO CORPORATIVA: NOVAS TECNOLOGIAS E O MERCADO DE TRABALHO

Alexandre S. Matos, Hortência de Abreu Gonçalves, Maria Tereza Ettinger de Oliveira, Zênia de Oliveira Nascimento

The corporate education presupposes the concept of open learning communities that aim the exchange of knowledge in an interpersonal and collective way, involving the correlation between theory and practice. From this perspective, enterprises started to assume an important role in people development, turning the organization boundaries more permeable and decreasing the gap between market and academy. It's a change of paradigm that requires more agility, flexibility, social competence and creativity, favoring the potential of collaborators and helping in creation of corporate potential. The programs of corporate education, as a mean to developing people, face the challenge that is not only to attract the one who participates, but also to keep him in the process of improvement, lined in practices of teaching-learning that include information technologies and the group of abilities and competences that are necessary to the changes required by the labor market.

PROJETO INTEGRADOR: UMA PRÁTICA PEDAGÓGICA INTERDISCIPLINAR PARA A CONSTRUÇÃO DE COMPETÊNCIAS E HABILIDADES EM ESTUDANTES DE ENGENHARIA

Silvia Maria de Paula, Leonardo André Testoni, Paulo Roberto Bernardo da Silva

The educational institutions wishing to the improvement of teaching strategies that are capable of bringing the learning from the classroom to society and to the labor market. Among the various learning strategies applied in the classroom, is the Integrator Project (PI) that enables communication between the different disciplines of the curriculum of engineering, promoting interdisciplinarity, presenting itself as well as an important didactic-pedagogical tool capable of bringing the future engineer their professional reality. The research was conducted in a class of 1st year engineering at a private university in São Paulo . The aim of this work is to present the steps of preparing a PI developed by engineering students, emphasizing the importance of the construction of competences and skills, treating the project as a source of linkage between the school activities, the labor market and the society

CONTROLADOR DE CARGA CC AUTOMOTIVO COM PRIORIDADES UTILIZANDO TÉCNICA DE ÁRVORE DE DECISÃO APLICADA EM VHDL

Fabiano Breschi, Luciana C. Leite, Edson A. Batista, Alexandro Pastick de Carvalho

The paper proposes the use of an advanced search algorithm to monitor and control the changes of electrical charges of the vehicle through an automotive CC charge controller with priorities. The algorithm, based on the Inductive Decision Tree technique, was implemented in VHDL. In case of faulty alternator, the algorithm should prioritize the loads that are vital to the vehicle operation. With the proposed technique, it is possible to optimize the use of energy stored in the battery or alternative sources, since the non-vital systems (air conditioning, windshield wiper, sound system, electric water injector windshield, electric seat adjustment and rearview mirrors) may gradually be turned off, keeping only the main loads, such as electronic injection unit, electric fuel pump, lighting system, among others. This condition should allow the faulty vehicle to be taken to a suitable place for maintenance of the generation system.

TECHNICAL SESSION PT3C

FIBRA DE COCO COMO BIOSSORVENTE NA REMOÇÃO DA MATÉRIA ORGÂNICA DE ÁGUAS RESIDUAIS

Simone de Fátima Pinheiro Pereira, Jessica Amaral Bittencourt, Rafaella Galvão Miranda, Erica Karine Lourenço Mares, Davis Castro dos Santos, Geiso Rafael Oliveira, Antônio Eder Santos Maciel

The search for new technologies for wastewater treatment has focused on the use of biomass as biosorbent materials with a good performance. The objective was to use coconut fiber disposed in Belém-PA in the removal of organic matter. The coconut fibers were dried at 80 °C (biosorbent 1) and 60 oC (biosorbent 2) for 24 hours, crushed and sieved. 50 mg of the biosorbents was stirred for 24 h in 20 mL of the wastewater sample and filtered. Was used the reflux titrimetric method using block digester Q-325M in the analysis of chemical oxygen demand (COD). The biosorbent 1 showed better adsorption capacity, with efficiency of 66 % (1 point) and 23 % (point 2). The biosorbent 2 adsorbed only 33 % (1 point), and 23 % (point 2). It was concluded that the use of coconut fiber in the wastewater treatment can be a good alternative for the recovery of contaminated water bodies.

REMOÇÃO DE METAIS DE ÁGUAS SUPERFICIAIS USANDO CARVÃO VEGETAL DE AÇAI (EUTERPE OLERACEA MART)

Simone de Fátima Pinheiro Pereira, Antônio Eder Santos Maciel, Davis Castro dos Santos, Erica Karine Lourenço Mares, Geiso Rafael Oliveira, Jessica Amaral Bittencourt , Johny da Silva Oliveira

Several alternatives have been proposed in order to minimize the harmful effects that the disposal of metals in Amazon rivers. The objective of this work was to study the use of acai (Euterpe Oleracea Mart.) to remove metals in surface Waters. Samples were collected from 19 sampling stations in the rivers Guama, Barcarena and Guajará Bay. The acai charcoal was prepared and used in the removal of metals using a low cost filter. The river water

quality was performed using multiparameter probes and ICPOES in the analysis of metals. The results for water quality showed that the rivers assessed retain characteristics of preserved rivers with all parameters (average) in accordance with the 357/05 CONAMA Resolution. The use of acai coal showed variation from 41.67% to 67.46% in metals removal from water surface and can be an inexpensive

FALHAS NO PROCESSO DE LICENCIAMENTO DA CONSTRUÇÃO DA UHE BELO MONTE E SUAS CONSEQUÊNCIAS SOBRE AS TRIBOS INDÍGENAS DA VOLTA GRANDE DO RIO XINGU

Keyla Cristina Farias dos Santos, Thomas Adalbert Mitschein, Simone de Fátima Pinheiro Pereira, Daniel Pinheiro Nogueira, Cléber Silva e Silva

The aim of this study was to evaluate the failures of the licensing process of Belo Monte and its consequences for the Arara indigenous tribes of the Volta Grande and Paqui• amba who will suffer the greatest impacts of the project. The methodology used to document analysis available, including the licensing process, the minutes of the public hearings, proceedings of the Federal Public Ministry (MPF), references on the topic, interviews with residents and indigenous leaders as well as field research site and work in the city of Altamira. The results showed serious flaws in licensing as not broad discussion with society in general, including the local population, the indigenous tribes, research institutes, universities, and MPE, MPF and other actors in the process. Realizes that the economic power and political power overwhelmed the interest of indigenous people who are the most suffering to advance the work.

IMPACTO AMBIENTAL DA CONSTRUÇÃO DA UHE BELO MONTE SOBRE A QUALIDADE DA AGUA DO RIO XINGU

Keyla Cristina Farias dos Santos, Thomas Adalbert Mitschein, Simone de Fátima Pinheiro Pereira, Daniel Pinheiro Nogueira, Cléber Silva e Silva

One of the major impacts of the construction of the hydroelectric plant of Belo Monte (Altamira - Pará state - Amazon region) will be on the water quality of the Xingu river. The research objective was to evaluate the changes that are already occurring in the river water Xingu. Was investigated the chemical changes in two distinct periods. In terms of medium, the pH presented a reduction to 10.23 %, the OD was from 5.48 mg/L and has increased to 7.46 mg/L represents an improvement in this particular parameter. The Cr, Pb and Zn showed an increase significant, which may represent a health risk. The metal levels found represent risks to the health of local populations including indigenous tribes who generally use water from the Xingu river, in nature, for your consumption. The reduction of the vegetal coverage and increased runoff may have been responsible for increasing the concentration of metals.

IMPACTOS SOCIO-AMBIENTAIS DE GRANDE EMPREENDIMENTO IMOBILIÁRIO PRÓXIMO ÀS COMUNIDADES CARENTES NA ILHA DE CARATATEUA-BELÉM-PA-BRASIL

Daniel Pinheiro Nogueira, Daniel da Fonseca Silva, Simone de Fátima Pinheiro Pereira, Tiago Rolim Marques, João Baia Brito, Cléber Silva e Silva, Keyla Cristina Farias dos Santos, Sheila de S. Corrêa de Melo

The Caratateua island (Belém - Pará Amazon Region), has an organization of small communities that survive the production of agroforestry products and fishing. The implementation of a large housing project has changed the routine of traditional communities that are in your neighborhood. The objective was to identify the socioenvironmental impacts resulting from the implementation of the project in some communities in the island. Were used questionnaires with open questions and interviews with 50 residents. The implementation of this project in an area severely lacking may cause socioenvironmental impacts since it is not happening to the structuring and preparation of local residents who may feel excluded from the development process. Environmental considerations have been evaluated in accordance with the EIA-RIMA presented the Environmental Secretariat (SEMA-PA) by closed condominium.

AVALIAÇÃO DA INTEMPERIZAÇÃO DO SOLO DE UMA ÁREA DE LIXÃO NA CIDADE DE TUCURUI - PARÁ - BRASIL

Ishi Ramalho, Cléber Silva e Silva, Afonso da Silva Mendes, Michelle Cristiane Carvalho da Silva, Barbara da Costa Almeida, Simone de Fátima Pinheiro Pereira

The study evaluates surface soil samples from a nearby region currently inhabited an area previously occupied by disposal of solid waste from various sources (landfill) in order to verify a possible efficiency in agricultural productivity and recovery of this land to the inhabitants of these avoiding probable disease areas . This research was carried out physico - chemical and chemical (pH, organic matter, exchangeable calcium and magnesium, exchangeable aluminum, exchangeable hydrogen and aluminum). The parameters studied were those recommended to the relevant literature , taking into account the results obtained in this work it is concluded that the studied soil in the neighborhood Beira Rio (Tucuruí - PA) has low fertility , by presenting acidic character possessing high availability of aluminum, thus raising the toxicity of the soil . While the content of organic matter varies intensely at all points due to the continuous removal of the solid residues from this area did not allow the formation horizons

CARACTERIZAÇÃO FÍSICO-MECÂNICA DE BIOCOMPÓSITOS DE AMIDO TERMOPLÁSTICO REFORÇADOS COM FIBRAS DE CURAUÁ FABRICADOS POR TERMOPRENSAGEM

Cléber Silva e Silva, Luis Fernando Gomes dos Santos, Jean da Silva Rodrigues, Simone de Fátima Pinheiro Pereira

The demand for new materials that do not harm the environment drives the development of new engineering materials that combine good properties with biodegradability. One such source is starch, assuming thermoplastic characteristics when subjected to physical and chemical changes . This study aimed to develop and characterize starch thermoplastic biocomposites reinforced with different fiber content curauá . The method of manufacture was thermopressing by using glycerin as plasticizer . Tensile tests were performed to evaluate the mechanical behavior , testing of water absorption and thickness swelling for analysis and SEM. The results show that the tensile strength of the material and its elastic modulus increased as the fiber content increases , as well as water absorption and thickness swelling . The results also showed that processing errors resulted in losses of properties in the biocomposites with 10 and 15% fibers.

TECHNICAL SESSION PT3D

MEDIÇÃO E ANÁLISE DE FLUXO DE POTÊNCIA EM QUATRO QUADRANTES COM FPGA

João C. Siqueira, Edson A. Batista, Raphael C. Gomez, Ruben Barros Godoy

This paper presents a proposal for measurement, analysis and control of a three-phase power grid in four quadrants to identify the power flow using the described equations in VHDL, which are synthesized and implemented in FPGA. The results were validated using FPGA simulation techniques such as FPGA in-the-loop, co-simulation, embedded processing and the comparison with the experimental practical tests. Through the controller available resources it can minimize voltages and currents reading errors and delays, performing faster analysis and control response acting on the system with almost instantaneous decisions making.

ACIONADOR COM TEMPORIZAÇÃO PROGRAMÁVEL DE CARGA

Valéria Domiciano, Christiane Gorski, José de Medeiros, Ciro José Egoavil Monteiro

In this paper we present the process of running a project whose main function is to trigger electronic devices automatically so programmed using PIC microcontroller. The working system operates so that the controls are set the hours and minutes desired for the electronics is triggered. The design can be used in various electronic devices such as alarms, air conditioners, lamps ... The system is activated by a relay actuator and has a voltage regulator. The board has a display for viewing the time, being easy teaching. The project was built with components studied in the semester in which applies Electronics I, thereby making the students can easily assimilate the operation.

ARQUITETURA LÓGICA DO MODELO E-MATURITY - DESENVOLVIMENTO E FUNCIONAMENTO DO SISTEMA

Herik Zednik Rodrigues, Liane Margarida Rockenbach Tarouco, Luis Roque Klering, Eder Paulus M. Guerra, Filipe Damasceno

This article aims to present and describe the development and functioning of the model evaluation and follow techno-pedagogical management (e- Maturity). This system has requirements for operation of a questionnaire -type web-based self-assessment applied to schools of Basic Education to monitor the level of technological maturity, whose architecture was chosen as the MVC (Model-View -Controller), to allow separate information , business rules and interface with which the user interacts. The questionnaire proposes seven basic elements for evaluation : Management and Leadership, Curriculum Planning, Managing the Process of Teaching and Learning, Management Assessment, Training for use of ICT in Education, Resources Management and Management of e-safety. The e-Maturity model was based on the tools e-learning Maturity Model - EMM, prepared by Marshall and Mitchell; Self Review Framework for ICT, originally developed in England by Naace, and the CM360o model proposed by Franco, Santos and Terra.

"NEM TUDO SE APRENDE EM SALA DE AULA...":SEQUÊNCIA DIDÁTICA – O USO DA AULA DE CAMPO COMO PRÁTICA PEDAGÓGICA NO DESENVOLVIMENTO DA DISCIPLINA TRANSPORTE FERROVIÁRIO.

Lisleandra Machado

This paper demonstrates the critical importance of pedagogical practice, the teaching sequence and the use of fieldworkin class in the teaching-learning process of the Cargo Transportation Technical course. In the field of engeneering is usual to encounter colleagues who complain about difficulty in mastering the modern pedagogical practices. Conducted a didactic sequence "outside the classroom" who treated a series of classes taught by different personages that has not shown a mandatory final product , however, took students the challenge and learning to work discipline Rail, taught by teacher Lisleandra Machado. Students participated in a technical visit to the Railway Museum of Juiz de Fora, attended a lecture on UFJF - Universidade Federal of Juiz de Fora entitled Communication Systems and Train Control (C & TC) in the U.S. - Actual Scenario & Perspectives. Finished the didactic sequence with the third field class of with clear definition of objectives.

BAFÔMETRO ELETRÔNICO CONTROLADO PELA PLATAFORMA ARDUINO UNO

Carlos de Oliveira Santiago Filho, Cleymisom Queiroz da Trindade, Daniel Vitor Domont Ferreira, Carlos Alberto Tenório de Carvalho Júnior, Carlos Vinicius da Costa Ramos, Ciro José Egoavil Monteiro, Júlio Sancho Linhares Teixeira Militão, Wilson Sacchi Pet

On a breathalyzer measures the amount of alcohol per liter of alveolar air, ie air from the lungs. The project aims at the development of a breathalyzer, using the sensor of gas MQ-3, a drive microcontroller Arduino Uno and a liquid crystal display. For each concentration of sensor alcohol determines a value displayed on the serial port 'COM3' Arduino Uno with a range from 0 to 1023, this variation corresponds to the output voltage, ranging from 0 to 5 volts of the circuit for each concentration. The concentration is measured appears on the LCD, determining the concentration present in the air.

O LABORATÓRIO REMOTO NA INVESTIGAÇÃO CIENTÍFICA E NA ATUALIZAÇÃO PROFISSIONAL

Érica Vasconcelos de Morais, Luis Carlos Origa de Oliveira, Rodrigo A. Nunes de Oliveira, Luiz Fernando Bovolato

In the academic field it can be seen that there is a substantial imbalance between the number of scientific works involving digital simulations and the number of experiments performed in the laboratory. The experimentally obtained results should, essentially, not only anchor the computational applications to the real behavior of electrical power grid, but especially also encourage the improvement of the theoretical models. The potential of remote labs in scientific research environments is remarkable and can resolve this imbalance. It may foster the corporate activities of scientific research among different groups and/or research institutions. Besides rationalizing

implementation costs, its use also avoids the duplication of equipment in different locations. Therefore, this study presents an evaluation of the use of technology of remote laboratories in the scientific research in electrical engineering. Further, it investigates in the matter of apprenticeship targeted to the area of power quality through remote access laboratories of FEIS/UNESP.

APLICAÇÃO DO MODELO DE ACEITAÇÃO DE TECNOLOGIA PARA AVALIAR A ACEITAÇÃO E USO DE SOFTWARE ERP

Fábio L. de Moura, Francieli A. Ferreira, Victor Freitas de A. Barros

The ERP process adoption directly influences the effective use of information by all sectors of the organization, allowing reaching the expected goals by managers. However, for this system to be applied effectively in the organization, it is necessary to analyze the level of acceptance of this technology by all sectors of the organization. From these assumptions, this article aims to analyze the level of acceptance of ERP, implemented for more than four years in a company of thermoplastic injection, located in Brazil. For this analysis, the TAM model (Acceptance Technology Model) was used to aid in the identification of issues related to acceptance and use of the ERP. To collect data, a questionnaire containing 29 questions was applied daily in the organization for a group of 30 employees using the ERP. It was possible to identify the Perceived Ease of Use Perceived Usefulness interfered in the ERP, affecting the Real Use of System.

AVALIAÇÃO DA QUALIDADE DA INFORMAÇÃO: UM ESTUDO DE CASO

Francieli A. Ferreira, Fábio L. de Moura, Victor Freitas de A. Barros

The technological era has revolutionized business. Today, organizations need to deal with increased information. Information that, if not used properly, endanger the results of decisions. However, if used properly, it helps in decision-making. Factor for this to happen, it is essential to have quality information. This study has the objective to make an assessment of the quality of information, derived from a computer application. For the analysis, the concept of categories and dimensions of information quality, proposed by Wang will be used. The result presented by the research indicates that, for users, information quality is relatively good, but needs attention to some dimensions for success and greater assertiveness in decision-making

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