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Author List

Casey Ricketts

Priya Darshini Kurup

Dr. Antonio Sanchez

Dr. John Durrett

Dr. Lisa Burnell

Dr. Arthur D. Hanna

Dr. David A. Abarca

Dr. Ebru Cankaya

Dr. Eric Wong

Dr. Jeyakesavan Veerasamy

Dr. Lawrence J. Osborne

Dr. Lester Towell

Dr. Trissa Cox

Dr. Rajan Alex

Dr. Rakesh Verma

Dr. Sam Hajazi,

Leigh Smith

Bashar AlArnous

Thuraya Hijazi

Dr. Stefan Andrei

Dr. W. Eric Wong

Dr. Will McWhorter

Ron Carswell

Shohreh Hashemi

Tim Farage

Ruth Robbins

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Screen Capture Tools and Techniques for Android Tablets

Dr. Will McWhorter

Northeast Texas Community College

wmcwhorter@ntcc.edu

Screencast videos have become a popular way to demonstrate how to use software applications. Screencasting allows users to record videos of exactly what they are doing on their computer so that viewers can follow steps to complete tasks and acquire new skills. Another recent trend in computing is the growing popularity of Android tablets and smart phones. These mobile computing devices offer users a wide variety of applications to enhance their daily lives. Tablets have also become very popular tools in physical classrooms yet incorporating their use in online environments presents certain obstacles. This presentation will describe the challenges of recording Android tablet screencast video and will explore different tools and techniques presently available. Topics will include webcams, apps for capturing video straight to tablet, apps for wireless transfer of video, HDMI, SlimPort, and screen capture software.

Keywords: Android screencast HDMI SlimPort

Developing Passionate Programmers through Outreach Programs

Dr. Jeyakesavan Veerasamy

Director of CS Outreach,
The University of Texas at Dallas

jeyv@utdallas.edu

We have been conducting several workshops in various programming languages (Alice, JavaScript, Java, C++, and Python) in various school breaks from 2012. Additionally, we conduct programming competitions every semester and several summer camps too. While our workshops & camps have been primarily geared towards middle & high school students, we expanded our workshops to Elementary students this Summer (we used Scratch and Logo)! Going forward, we will have programming workshops for every one from 3rd grader to working professionals! See www.utdallas.edu/k12 for details.

We strongly recommend multi-step approach (Scratch-->Alice-->JavaScript-->C/C++/Java) instead of introducing C++/Java directly for school students and college students. We hope to share our experience and help other institutions establish similar activities in their cities.

Keywords: enjoyable programming, Scratch, Logo, Alice, JavaScript

Combining an Existing Knowledge Management Model with a Business Intelligence Component

Sam Hijazi (DBA-IS), Leigh Smith (MBA), Bashar (BA)

This study will discuss how knowledge management (KM) is related to Business Intelligence (BI). The emphasis is on their similarities, differences, how they complement each other, and where they intersect. Research indicates that BI is a subset of KM. The intention of this presentation is to show that both approaches are interrelated. If they are used together, there is an opportunity to maximize the benefit to any organization. KM and BI contribute to increase in the intellectual capital of any business entity. This study will build on an existing KM model and add the BI part in order to enhance the functionality of the model. By adding BI as another element to the model, it becomes clear that no significant factor is missing in the process of making decisions to reach optimal solutions. The study also will show that both KM and BI impact the business world if they are utilized and applied with the right technologies, methodologies, leadership, and other nontechnical components. The main idea is to create an enhanced awareness in order to produce an actionable business environment. With the new understanding obtained from applying both KM and BI, there is almost a guarantee for a successful business process where sustainable performance is assured.

Keywords: Knowledge management, Business Intelligence, Information Systems, Decision Making, Action.

Building a Virtual Learning Community to Help the Syrian Students Continue Their Learning

Dr. Sam Hajazi, Thuraya Hijazi

The Syrian students have suffered as a result of the turmoil in their country. Many students had to escape the country to save their lives while others had to move to another part of the country to a safer place. This presentation will share an attempt to alleviate the suffering of the community of learners by building a virtual learning place using a variety of available technologies. Most of the learners included in this study are from the suburbs of Damascus, mostly a town near the capital called Altal. With some funding from a relative, the presenters were able to offer free training videos, seminars, useful resources, and other educational materials. The study will survey some of the potential students who have and might use this service. It will survey their needs, challenges, and choices to narrow their educational cap. Using readily available technologies such as Skype, YouTube, video recording software, image manipulation and virtual meeting software made this attempt very rewarding. The study will not cover the technical side of our attempt, but also it will discuss the human side of this project.

Keywords: Virtual Learning, Syria, Community

Building WAMP Server in a Windows Computer to Utilize Wordpress

Dr. Sam Hajazi

In addition to being a popular content management system, Wordpress makes it possible to choose among many themes, plugins, widgets and other helpful tools. One main issue is to protect your website before you post it for the rest of the world to see. The study shows how to install and use WAMP server locally on a Windows computer in order to utilize Wordpress. The acronym WAMP stands for Windows, Apache, MySQL, and PHP. The server includes all the needed tools including the famous PhpMyAdmin interface to easily create databases. The presenter will demonstrate how to install WAMP, create a database to hold all needed files by Wordpress, create a website using a responsive theme.

Keywords: WAMP Server, Web Development, Wordpress, Content

Mobile Database Application Development

Dr. Rajan Alex

West Texas A&M University, Canyon, TX 79016

ralex@mail.wtamu.edu

This work is to give some basic information about mobile database applications, architecture, design, and development. It will provide hands on understanding in creating, updating, and retrieving a mobile database application using SQLite database which is an Open Source Database that is embedded into the Android platform. Mobile database applications are generally not developed on mobile devices because they are too small and very inconvenient to develop application on them. So the approach is to develop mobile database application on a computer and launch the application using the Android Virtual Machine. Once the application is running as proposed in its design, it may then be run on a mobile device. The work will download the needed software components, and use them to develop a mobile database application for the Windows environment.

Keywords: SQLite database, Android platform

Improving K to PhD Education Using Online Learning

Tim Farage

At this point in human civilization, most of us rightly assume that each student deserves to have a good education. This is one major signpost that humanity is moving forward. Of course, many if not most students are not receiving a good education, although much effort is being made to correct this.

The purpose of this proposal is to give the general principles as to how every student can obtain an excellent education.

In order to give such principles, it is first necessary to define the purpose of an education.

Changing the Programming Language in Introductory Level Courses From Java to C++

Dr. Ebru Cankaya

University of Texas at Dallas

Department of Computer Science

This paper presents the effects of changing the programming language in introductory level courses (Computer Science I) in undergraduate Computer Science curriculum. The study presents the example of University of Texas at Dallas (UTD) case, where Computer Science I courses have now adopted C++, instead of Java as the programming language and Computer Science II courses still continue to be in Java.

The paper presents supporting data together with statistical analysis to determine the significance of difference.

TCB Requirements and Introductory Computer Courses

Shohreh Hashemi, Ruth Robbins
University of Houston-Downtown
hashemis@uhd.edu and robbinsr@uhd.edu

In January 2009, the Undergraduate Education Advisory Committee (UEAC) suggested to the Texas Coordinating Board (TCB) that the statewide general education core curriculum should be revised to ensure that the core delivers both current and future knowledge and skills. In 2011, TCB approved the revision to a new core curriculum that includes 42 foundation component area semester credit hours addressing six core curriculum objectives. The core curriculum objectives were defined as communication skills, critical thinking skills, empirical and quantitative skills, teamwork, social responsibility, and personal responsibility. Furthermore, while 36 of the 42 semester credit hours were chosen in eight specific foundation areas that did not include computer literacy, only six semester credit hours were left as an option at the discretion of each higher education institution.

Strongly believing that computer knowledge and skills are essential for today's students, the authors developed a freshmen seminar course of three semester credit hours that maps the TCB's core curriculum objectives requirements into the traditional introduction to computer course, so that the computer introductory course would be included as an option in the core curriculum at University of Houston-Downtown. This presentation provides an overview of TCB's core curriculum requirements and how the new freshmen seminar course contents, assignments, and tests are tailored to meet the TCB's core requirement. Furthermore, the new freshmen seminar's course syllabus, tests, and assignments are discussed and examples are provided.

Keywords: Texas Coordinating Board (TCB), Undergraduate Education Advisory Board (UEAC), Core Curriculum, General Education, Introduction to Computer Information Systems

How 3D Printing Will Change Education: After All It's Not Rocket Surgery

Dr. Lester Towell, Dr. Trissa Cox

St. Mary's University, San Antonio, Texas 78228

Computational thinking is thinking like a computer scientist, the kind of thinking absolutely required to formulate computational solutions to algorithmic problems.

Aristotle wrote, "For things we have to learn before we can do them, we learn by doing them." Which begs the question: How can a student do something that the student has not yet learned to do? Answer: Let the expert (teacher) do it with them, but provide a way for the student to actively participate in the process.

Expert show-and-tell programs do not actively involve the student. The sink-or-swim approach requires the student to write large programs from scratch with little or no expert help does actively involve the student, but "swimmers" are usually students who already can think computationally, whereas "sinkers" are students who cannot.

This paper's answer for fostering computational thinking, the programming case study, requires the student to fully understand the problem and to actively engage in re-solving it by answering computational thinking questions and by supplying "missing code" segments.

A case study includes: 1) an introduction of background material required by the student to understand the statement of the problem and its solution; 2) a clear statement of the problem; 3) a sample of the program/user dialog to provide the student with test data; 4) a collection of computational thinking questions which are keyed to the program listing; and 5) the program listing with code segments strategically elided which become the student's responsibility (aka, "missing code").

Keywords: computational thinking, programming, case study, pedagogy

Virtualization in the Classroom

Ron Carswell

Virtualization, an excellent solution for the classroom, balances the expanding hardware/software needs of increasingly complex implementations that meet the expectations of the IT industry with budgetary constraints. This session provides information on the methodologies implemented at San Antonio College in the Computer Information Systems Department. This session focuses on the virtualization products of Microsoft and VMware.

For beginning students, virtualization provides a stable environment to complete learning activities in the classroom/laboratory. Intermediate students use virtualization to create “networks in a box”. Advanced students work with the intimate details of virtualization to create “private clouds”. Includes information on a recent NSF Grant for private cloud classes.

Building a Secure and More Prosperous Texas

David A. Abarca, EdD, CISSP

Assistant Professor and Information Security Program Director for
The Department of Computer Science, Engineering and Advanced Technology
Del Mar College
dabarca@delmar.edu

Each week a newspaper headline or a news broadcast delivers another instance of the Grimm reality that is now a part of our technology-driven life; a new hack of a computer system or network resulting in theft or the loss of personal information for a large numbers of individuals. It is so common that many of us see it as a fait accompli that their own information will be lost and misused at some point. Indeed, many have already experienced this fate.

It is not just financial and personal information that is at risk—the number of attacks affecting local and state governments is also increasing. From fire and police departments to public utilities, industry, and city government functions, communities today cannot function without their cyber infrastructure and physical infrastructure monitored and controlled by network and information technology—from water services to electrical power to telecom.

Cybersecurity is important in terms of national, state, and local goals to prepare a 21st century workforce, align education to existing advancements in the world of technology, build economic capacity for competitiveness, and, ultimately, ensure national security. Join Dr. Abarca for a timely presentation and discussion about cybersecurity education and its role in Texas collaboration, competitiveness, and innovation. This presentation features the results of the Texas Cybersecurity, Education, and Economic Development Council's research, analysis, and recommendations for programs and resources from across the state with solutions focused on the cyber security workforce, education, and economic development practitioners.

Keywords: Cybersecurity, Education, Economic Development, Legislation

Rethinking Software Testing in Undergraduate Education

Dr. Eric Wong

Department of Computer Science

University of Texas at Dallas

ewong@utdallas.edu

Regardless of occupation, software is a fundamental part of every individual's life. Unfortunately, defects are frequently discovered in such software, requiring significant expenditure to maintain and repair. To ensure the quality of the software, testing is the most popular technique used in practice.

However, the broad scope of software testing cannot hope to be adequately covered even in a course dedicated to the subject, much less by a more general software engineering course with many competing learning objectives. An important goal is to help students establish the mindset that testing is a critical part of the software development process to be conducted in a rigorous manner, not as an afterthought.

To this end, our pedagogical model relies on the following key concepts: many-to-many, minimally intrusive, and non-restrictive. A many-to-many relationship is developed between courses and the instructional modules we created as part of an NSF-sponsored TUES project, where educational materials are selectively applicable to any appropriate courses in a minimally intrusive and non-restrictive way.

Rather than briefly covering software testing in a single course, testing skills and topics can be introduced in many different courses, both basic and advanced, at the appropriate skill level of the students. This kind of broad and complete coverage is necessary to ensure that students are prepared to effectively test software as future engineers.

Keywords: software testing, computer science, software engineering, minimally intrusive, non-restrictive

A Comparison of Two Ways of Teaching Discrete Structures to Undergraduate Computer Science Students

Lawrence J. Osborne, Ph.D. in Computer Science

Department of Computer Science

Lamar University

Beaumont, TX 77710

ljosborne@lamar.edu

The popular model of teaching mathematics starts with a few basic mathematical structures and a collection of axioms “given” about these structures, and then various important questions are answered about these structures that can be stated as formal mathematical propositions and the task of the student is to seek a deductive pathway from the axioms to the propositions or their denials. The popular model of teaching mathematics might be called the definition-theorem-proof model of mathematics. However, this is not how we advance human understanding of mathematics. We are trying to find ways for people to understand and think about mathematics. The rapid advance of computing has dramatized this point. The standard of correctness and completeness necessary to get a computer program to work at all is much more difficult than the mathematical community’s standard of valid proofs.

This presentation presents the results of teaching two sections of Discrete Structures in two different semesters. In the first case, the course was taught using the standard popular approach, and in the second section using computation as a source of illustration, motivation and experimentation. The presenter found that computational examples and experiments led to a better understanding of the problem and often suggested ways of solving the problem. Proofs led to showing that the observations held in general, and they gave a deeper insight into the patterns exhibited by the observations. Examples of the approach to teaching topics in discrete mathematics are described and the test results of the two sections are shown.

Keywords: Discrete Mathematics, Theory, Algorithms, Computer Uses in Education

Roadmap for Involving Undergraduates in Research

Dr. W. Eric Wong

Department of Computer Science

University of Texas at Dallas

ewong@utdallas.edu

One of the standing goals of the National Science Foundation (NSF) is to promote hands-on undergraduate participation in research projects, giving these students an opportunity to learn the fundamentals of research at an earlier stage of their academic development.

Two mechanisms are at the forefront of this objective: REU (Research Experiences for Undergraduates) sites and REU supplements. After declaring its research focus from one or more disciplines, each REU site hosts students selected nationwide to take part in a research project over the course of an eight or ten-week summer session. This program bears similarities to those created by other counties to achieve a higher exposure of undergraduates to research experience.

We will share our experiences and lessons learned from our University of Texas at Dallas-based REU site which is concentrated on *Software Safety*. However, the technology and skills learned at this site are not necessarily specific to this topic, giving students an advantage in their future endeavors with respect to communication, research methodology, and critical thinking skills.

We will also discuss issues such as research developments, recruitment of students from under-represented groups, project selection and mentorship, effective preparation of students, metrics for student progress and success, teamwork between graduate and undergraduate students, industry collaboration and field trips, etc.

Keywords: undergraduate research, REU, NSF

Teaching Power-Aware Scheduling Techniques

Dr. Stefan Andrei

Lamar University

Reducing energy consumption is a vital research area with many works describing scheduling algorithms minimizing the total energy of a system. Hence, teaching power-aware scheduling techniques is not a simple task. This presentation addresses this challenge by emphasizing a scheduling technique which provides an optimal schedule in terms of power.

Broadening accessibility, opportunity, and employability: The Technology Management Program in the College of Education and Human Development at Texas A&M University

Casey Ricketts, Priya Darshini Kurup

The purpose of this presentation is to provide an overview of the Technology Management degree program housed within the College of Education and Human Development at Texas A&M University. This unique program offered in collaboration with Blinn College provides access and opportunities to transfer students, first generation students and both traditional and non-traditional students. It is designed to develop both managerial and technical knowledge and skills required to meet the demands of today's workplace. We will discuss the development and growth of this program, how classes are included within the degree plan, and will inform students for career options after graduation. Our presentation will conclude with an overview of the pathways for admission into the Technology Management program at Texas A&M University.

Keywords: Technology program, Transfer students, Employability

Enriching Security Curricula with Data Analytics

Rakesh Verma,¹ PhD

Stephen Huang,¹ PhD

Lila Ghemri,² PhD

Ping Chen,³ PhD

Wenyaw Chan,⁴ PhD

¹Computer Science Department, University of Houston

²Computer Science Department, Texas Southern University

³Computer Science Department, University of Massachusetts – Boston

⁴Dept. of Biostatistics, University of Texas Health Science Center

Recently, many problems in the area of computer, network and information security are being solved using techniques from machine learning, data mining, statistics and natural language processing. For example, statistics and data mining techniques have been applied to intrusion detection and natural language processing to phishing email detection. We present the design of several “plug and play” modules that can be dropped into computer security courses at both undergraduate and graduate levels. The modules include: Natural Language Processing for Security, Data Mining for Security, Statistics for Security, Machine Learning for Security, Intrusion Detection and Privacy Preserving Data Mining. Faculty colleagues at the three institutions are also developing modules on security of wireless sensor networks, electronic voting, Internet crime, Watermarking and related topics. We are using some novel strategies in the design of these modules in an effort to ensure the coverage and currency of these modules.

Keywords: computer and network security, privacy, data analytics, distributed networks

Using Programming Case Studies to Foster Computational Thinking

Dr. Arthur D. Hanna

St. Mary's University, San Antonio, Texas 78228

AHanna@StMaryTX.edu

Computational thinking is thinking like a computer scientist, the kind of thinking absolutely required to formulate computational solutions to algorithmic problems.

Aristotle wrote, "For things we have to learn before we can do them, we learn by doing them." Which begs the question: How can a student do something that the student has not yet learned to do? Answer: Let the expert (teacher) do it with them, but provide a way for the student to actively participate in the process.

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Keywords: computational thinking, programming, case study, pedagogy

Teaching Big Data: Programming and Applying Data Mining and Data Visualization

Antonio Sanchez, Ph.D.¹, John Durrett, Ph.D.², Lisa Burnell, Ph.D.¹

¹Texas Christian University, Fort Worth Texas,

²Texas Tech University, Lubbock, Texas

Students are always interested in learning the latest “hot topics,” which often are presented with plenty of hype and a lack of clarity. Among these, “Big Data” has rocketed to the top of the list in the IT world. The term refers not only to large datasets, but also to collections of data from multiple sources, to the techniques used to manage and analyze the data, and to the utilization of the results. In our case, we want to put into context three related topics: data mining, data analytics, and data visualization. Data Mining applies machine learning algorithms to obtain meaningful patterns from immense data sources. Data Analytics employs statistical algorithms to discover previously unknown relationships useful for detecting trends and making predictions. Finally, Data Visualization offers dynamic visual interfaces based on cognitive psychology in order to make results comprehensible. One course is insufficient to cover all of these topics; therefore, we suggest incorporating aspects of the topics across multiple courses and majors. For example, big data techniques can be woven into database and senior design courses in Computer Science, where the emphasis is on how to implement algorithms. Information Technology majors can develop visualization interfaces within a user interaction course, and Management Information Systems majors can apply Business Analytics to organizational data optimization. Through interdisciplinary cooperation, students not only gain a better perspective of “Big Data” methods and applicability; they also gain increased appreciation of interaction across domains in the real world.

Keywords: Big Data, Emerging Computing Trends, Interdisciplinary Education