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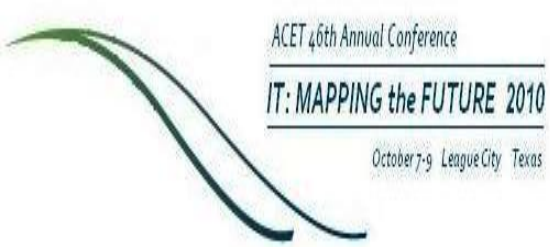

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Enterprise Reporting and Operational Efficiency

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In these tough economic times, IT has been tasked to cut costs, while providing operational efficiency via business intelligence (BI) and analytics. Most IT organizations' employees and business partners rely on these reports to perform day to day business operations to keep them up to date and support their decision-making, even as they acknowledge that the reports often do not provide complete or sufficiently timely information. IT's reporting responsibilities are ever increasing due to internal controls and to be in regulatory compliance to establish audit trails and define accountability. Strategic initiatives, such as improving customer satisfaction and thus retention, require collaboration among stakeholders. There is no consistency and cohesiveness to reports dispersed (using Excel, MS Access) throughout the enterprise. What is needed is an enterprise reporting platform to overcome data inconsistency, quality and latency problem.

Enterprise reporting with properly implemented data warehouses and data marts can enable organizations to advance their BI implementations toward operational efficiency. This aligns not only information but also people, processes, and technology systems with a common set of strategic goals and objectives. However, to give operational efficiency the much needed attention that it deserves while conserving resources, an organization's IT should implement an enterprise reporting platform that can decrease their workload by empowering consumers with data and information. By providing users with tools where they can run reports based on their filters, parameters, and drill down capabilities; based on clearly defined business rules, users can handle their own workload while keeping IT's costs and maintenance workload in check.

Keywords: IT, business intelligence

INSTEAD: A Learning Model in Teaching Computer Science to Freshmen Students

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Teaching courses for freshman students has always been a central research area for educators. Here are some of the important questions that many learning models are considering: How computing prior knowledge influence freshman students' attitudes towards computer science? Why some students are fully committed to subject matter while others are not? What are the students' motives and expectations with regards to the computer science program? By using a new teaching strategy called INstructor STudEnt CollAborative Dynamic (denoted as INSTEAD) approach, we observed that a prior computing knowledge has impacts on several aspects, such as: the students' self-concept with regard to computing and capacity of understanding of computer science subject, and learning mode in computing. We determined different perceptions towards computer science (summarized as: students' attitudes towards course preparation, confidence in the subject matter, and design), which together with students' capability to change the prior conceptions and attitudes of computer science enable or inhibit a long-term success in the field.

During the Spring and Fall Semesters of 2009, we used INSTEAD for teaching the first freshman Computer Science course: Programming Fundamentals I, also known as CS1. We measured the students' attitudes towards course preparation, confidence in the subject matter, and history of engagement in the coursework. We conclude that INSTEAD met our expectations.

Keywords: Freshman course, CS1, student attitude, performance, and retention

IT TEKS-based Web Resources for Secondary Education

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Curriculum reform is never an easy transition. However, curriculum specialists and a team of highly-qualified Texas teachers have worked together to developed several lesson plans, professional development modules, podcasts, and other resources to assist in making this transition an easier process for CTE teachers of Texas. The development and maintenance of Information Technology resources are supported by an Educational Excellence grant, which is funded by Texas Education Agency and housed at the University of North Texas in the Department of Learning Technologies. This presentation will (a) discuss the impact of revisions to the Texas Essential Knowledge and Skills standards (TEKS) to IT teachers; (b) outline the curriculum development process used to meet the needs of teachers; and (c) review the products and materials developed.

Keywords: IT curriculum, IT resources, CTE website, UNT, web-based resources

IT Service Management

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Services are organizational capabilities that are consumed as they are produced to provide value to recipients. Service thinking has become a mainstream concern in global industry, including in outsourcing companies and IT organizations that offer services to their own organization. In addition to managing quality of service, and hence, customer experience, IT organizations struggle to define what services mean for them. The practice of IT Service Management has developed to address those concerns and is supported by standards, such as ISO/IEC 20000, and best practices, such as ITIL v3. The objective of this session is to define services and the motivation for change, relate processes and services, describe key IT services, and how services change how we teach IT.

Keywords: Process, Service, IT Service Management, Service Blueprint

Issues in Digital Class Design

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Digital Forensics is a multidisciplinary field that involves elements of law, computer technology, business and criminal justice (investigations). According to the Digital Forensics Workshop, it involves the use of scientifically derived and proven methods for collecting, validating, analyzing and presenting digital evidence to document events that may violate organizational policy, governmental laws or regulations. It may also be used to help anticipate unauthorized events that may be disruptive to planned operations.

Digital Forensics practitioners may be employed in law enforcement, corporate, or military sectors. Each of these sectors shares a common forensics process. Though, practitioners in each area have unique perspectives along with unique goals. For example, a law enforcement practitioner typically works after a crime has been committed, with a goal of obtaining a criminal conviction. In contrast, a corporate practitioner would more typically focus on the monitoring and maintenance of enterprise operations. This includes monitoring digital assets to provide evidence that demonstrates that an employee's actions are in accordance with, or divergent from, organizational policies.

In addition, the digital forensics field is very dynamic. Consequently, the design and evolution of digital forensic classes can be a significant challenge. Here, we will present the major issues involved in the design and evolution of our computer forensic classes. These issues will include the selection of contents as well as an examination of related laboratory issues. Specific software issues will include open vs. proprietary software as well as virtualization.

Keywords: Digital Forensics, Class Design

Promoting Math Learning and Computational Literacy via Graphical Calculator Programming

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We are preparing a set of lightweight learning modules intended for algebra and physics classrooms in which students compose simple programs that generate graphics, simulate familiar physical phenomena, and implement simple video games on ubiquitous graphing calculators.

These modules are designed to complement standard math and science curricula in a manner that quickly engages students to key concepts of programming. In addition to strengthening understandings of key concepts required for success in STEM disciplines, these modules will provide large numbers of students a short and motivated introduction to programming that can inform future course and major selection.

Initial pilot studies are being performed within pre-calculus courses at UTEP and in El Paso high schools.

Keywords: Computational thinking, high school, programmable calculator, math and programming

Understanding Password Security through Password Cracking

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The password is the most commonly used approach to authenticating users on computer systems. A hand-on project on password security is developed to fulfill the need of offering new courses on cyber security and integrating security concepts into existing computer courses.

In the project, students conduct password cracking tests with a free, multi-platform password cracking software tool, John the Ripper. First, students create a list of user accounts with predefined passwords on the Linux/Unix platform. Some of the passwords are weak and some are strong. Then students retrieve and process the password files recording the user account and password information, preparing inputs for password cracking. Finally, the password cracking tool is executed to crack passwords. Students will find that weak passwords can be cracked in reasonable short time, but strong passwords cannot.

Through the project, students can learn (1) how the password authentication mechanism works, (2) how the password cracking technique works, (3) how to protect password security, and (4) how to choose a secure password.

This project can be tailored to suit the different needs of courses. Based on students' abilities and available resources, the first step or the first two steps of the project can be removed. Instead, the results of those steps are provided to students. The project is suitable for upper-level courses on computer and network security as well as introductory courses on computer science.

Keywords: Computer Security, Password

An Effective Scholarship Program for Science, Technology, Engineering, and Mathematics (STEM) Majors

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The serious short supply of professionals in Science, Technology, Engineering, and Mathematics (STEM) areas has become more obvious in recent years, and STEM has turned into a hot area for educators. Resources for promoting STEM education appeared at the national, state and regional levels from government and private institutions, providing important tools for educators recruiting and retaining STEM majors. The National Science Foundation (NSF) has several programs for promoting STEM education. The NSF Scholarship for STEM (S-STEM) program funds academically qualified STEM students who demonstrate financial need. In 2009, 29 colleges and universities and 3 community colleges received awards, many at the level of $600,000. At UHCL we have received two consecutive NSF grants since 2002 for STEM student scholarships for a total amount of $877,000, and we are applying for a third grant. The programs have supported more than 80 NSF scholars in the last eight years. The three year graduation rate of our scholars is 69%, about twice that of the national average. To attract other computing educators to consider this kind of program, this paper describes our experience in conducting a successful NSF funded scholarship program with strong academic and professional career enhancement plans: a student scholar organization in which students determine their direction through monthly meetings, career enhancing activities, regular meetings with faculty mentors, mid-semester meetings with the program director, and interaction with the career and counseling staff to help students stay abreast of current employment trends and best practice in resume preparation and interviewing.

Keywords: STEM, scholarships, grants

Interdisciplinary Collaboration to Teach Research Methodologies and Tools in Freshmen Courses

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Having students conduct research at earlier stages of their college education has become the norm. More often than not, freshmen and sophomore students are required to conduct research to identify problems, to gather and analyze problem-related data, to develop solution matrices for the problem, and to present their findings. Yet, in many cases, most students lack sufficient knowledge and skills to perform these tasks.

In this study, a small number of freshmen students were given a chance to enroll in introduction to English Composition and introduction to Computer Information Systems. The courses were offered on the same days, in adjacent time-slots, and in the same classroom; thereby, students would have an hour-and-a-half of English lessons immediately followed by hour-and-a-half computer literacy lessons. Lessons in these courses were synchronized so that while, students were introduced to various English composition topics; they would learn about research methodologies and master use of multiple computer search engines and software tools including Word, Excel, and PowerPoint in the computer literacy course.

First, students learned to organize their work and use Word to generate a research paper. As time passed and students gathered data, they were introduced to Excel and were required to use various formulas and functions to analyze their data and arrive at their findings. In parallel, in the English course, students were taught how to further organize and format their research paper and to develop solution matrices. Next, PowerPoint was introduced and students were required to develop a PowerPoint slide presentation of the problem and solution. Finally, they learned sufficient HTML coding and file transfer techniques to develop and launch web sites to showcase their work.

In this paper, the authors articulate their collaboration in teaching freshmen students the knowledge, skills, and tools to conduct comprehensive research.

Keywords: Interdisciplinary, collaboration, teaching model

Easy Does It - Using JavaScript to Teach Object-Oriented Concepts

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JavaScript is an easy-to-comprehend and use computer language. In addition to its ability to add dynamic and interactive capabilities to a website, it has impressive object-oriented programming (OOP) features. The size of a full fledge object-oriented languages such as C++ or Java can be intimidating to both beginners and advanced programmers.

This presentation will show how JavaScript can be used to introduce students to OOP concepts including encapsulation, inheritance, and polymorphism as quickly and as easily as possible. The presentation will include examples of each concept. Students who are majoring in computer science will find this discussion a friendly introduction to powerful concepts. Students who are majoring in Information Systems or business administration will acquire enough understanding of OOP to communicate their business requirements effectively.

Keywords: JavaScript, OOP, Object-oriented, Easy

Secured Access – Anywhere, Anytime
Using a Jump Drive and XAMPP to Teach Web Programming

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Teaching a web programming class with full access to the required servers can be a daunting task and a security nightmare to the IT department in any higher education institution. The need to access a web server such as Apache, a relational database such MySQL and a PHP interpreter, is problematic and a frustrating undertaking to both instructors and students. To alleviate the fear the IT department faces in order to prevent access to sensitive data or confidential areas in the college server, institutions look for other costly and time-consuming solutions. This presentation will show how XAMPP, free downloadable combination of software, is used to access all the needed technologies (Apache server, MySQL engine, PHP interpreter and phymyadmin) to teach successfully a web programming class from a jump drive. The portability of XAMPP, its availability as an open source, and its free price make it a dream come true to many instructors and students who like to learn web programming without having to deal with security issues or being tied to a place or time.

Keywords: Web Programming, teaching, Secured, Jump drive, portable

Some Considerations When Designing Online/Hybrid Courses

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There are a number of CAFÉ items to include when designing an online course. First on the list is **C**heating which is always a teacher's concern. Faculty need to insure that university standards and the integrity of courses are maintained. A Second priority is **A**nytime as it is a major factor why students demand online courses. The third, **F**ear of the unknown discourages many from adapting to online instruction. Lastly, the teacher must make **E**xplicit all directions regarding the course materials. Discussion on each of these will focus on decisions for model instruction that faculty must make whether the lessons are designed for face-to-face, online, or hybrid delivery.

Keywords: Online courses, hybrid courses, model instruction

Developing a Three Tier Web Application Using ASP.NET and Open Source Object-Oriented Database DB4Objects

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This paper details the use of DB4Objects object-oriented database and ASP.NET 3.5, MVC architecture and the Visual Studio IDE (Integrated Development Environment) to develop a three tier Web application. The major contribution of this paper is to show how a three tier web application can be easily developed and deployed by taking advantage of an open source object-oriented database instead of using ADO.NET or Datasets to access traditional relational databases. A sample web application called “Fee Management Tool” is developed to illustrate DB4Objects as the backend of the web application and the Visual Studio 2008 IDE can be used to run the DB4Objects plug-in. Future directions and implications are discussed at the end of the paper.

Keywords: Object-Oriented Database, ASP.NET, DB4Objects, Visual Studio, Web Application, MVC Architecture

Stimulating

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How can we attract students to Science, Technology, Engineering, Mathematics and programming? What tools are available for this purpose?

Hands-on activities are some of the tools we can utilize. To increase the hands-on creativity and help students comprehend the concepts of programming and math, we have incorporated robotics in programming courses at the college level. Incorporating robotics has added an element of fun that motivates students in such abstract subjects.

When students study robotics, they can learn about STEM subjects and programming, while they are having fun. They gain valuable experiences in managing projects, analyzing systems, accessing information, working in teams, and problem solving. Robotics is a great tool for hooking students to pursue a STEM course of study. We have learned that students experience a great sense of accomplishment when they use their creativity to design and make something of their own.

Keywords: Robotics, Learning Enhancement, STEM

Roundtable: Student Club Sponsorship

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This session will allow attendees to discuss ideas, tips, what works and what does not, in regard to student clubs. Whether you sponsor a CIS club, AITP club, or any other computer-oriented club on campus, come and share your experiences and questions with others. This roundtable will present a venue to help all of us make those student groups or clubs better through learning from the experiences of others.

The contents of the discussion will be attendee driven.

Keywords: Student Clubs, Mentoring Student Groups

Visual Studio 2010 – What's New

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This session will review the changes to the Visual Studio product for 2010. This includes things such as the new appearance and behavior. There is a new code editor, net search-as you type feature, a new look for the Start Page, Office APIs are now available to c#, and the introduction of F# - the new .NET framework language. Other new functionality and changes to the interface will be reviewed.

The session will also include a discussion of the implications of these changes to our Course curriculum. Attendees will be encouraged to discuss how these functions can be included in their current and future courses offered.

Keywords: Visual Studio 2010, computer education

Incorporating Emerging Technologies into the Capstone Experience

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Most four year CS and IT programs include a year-long capstone project in which students are required to develop a computer-based solution to a problem of significant complexity. One goal of the current capstone course at this university is to include, where possible, interesting, emerging technologies in order to better engage students. Several recent projects have been developed based on a low-cost experimental hardware platform for wireless sensor and embedded applications called Sun SPOTs. The SPOT (Small Programmable Object Technology) has onboard computing, sensing, and radio transmission capabilities. The SPOT sensor board includes 3D acceleration, temperature, and light sensors as well as switches, A/D input, and general purpose I/O capabilities.

This presentation will discuss the use of SPOTs in several interesting capstone projects. One project involved the development of a “Mote Monitoring System” in which a PC workstation could monitor, with graphical display, the connectivity and sensor readings of remote SPOTs. Another project developed a 3D acceleration-based gesture recognition system. That is, based on sensing motion in the X, Y, and Z directions, the system could both “learn” and “recognize” simple gestures. In addition, this project demonstrated its recognition capabilities by allowing up to four players to play a gesture-based game. In summary, SPOTs have proven to be a very appealing technology for students to work with as they provide numerous learning opportunities and interesting capabilities.

Keywords: Wireless sensor networks, accelerometer-based gesture recognition, Sun SPOTs, capstone course, gesture-based games

Blending SAP into the IS Classroom

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SAP enterprise resource planning software is an essential part of the business environment and is used by over 100,000 businesses in over 120 countries. Introducing SAP into the curriculum for all business students enriches the experience for these students and better prepares then for entrance into the business world upon graduation. This presentation shares how SAP has been infused into a junior-level Management Information Systems class.

Keywords: SAP, business software

Computer-Assisted Models for HS English Language Learners

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Research has strongly established the importance of modeling in language acquisition, but modeling is still often ignored in the classroom. If we provide students struggling with English with high-interest models of exceptionally fine speaking and writing, we can dramatically improve the quality and speed of their progress. Fortunately, there are many sources of such models to choose from which are free on the Web. Great care must be taken to assure that the models chosen contain substantial cultural references to function as interest hooks to the target audience, since the best models in the world will be ineffective if the students define them as alien and do not attend to them.

Keywords: Multicultural, bilingual, ESL, modeling, computer-assisted instruction

Emerging Information Technologies and Concepts

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Electronic commerce is the use of the World Wide Web to promote the exchange of information and the conduct of business in such broad spectrum and that generally gives organizations the ability to benefit from electronic technology using data interchange capabilities for information and data sharing, integration with application software within the global scope. The availability and the flow of information are 24 hours a day. The purpose of this "Roundtable Discussion" is to examine the rationale and possibilities for sharing data and define and investigate parameters that measures data utility. Business-to-Business (B2B), in the daily operation of their commercial activity are engaged with the flow and exchange of information between business partners who depend on each other's services and as well the trading information between buyers and sellers. The potential benefits of gathering and exchanging information are broad and may lead to the data overflow in addition to concern, fear, and possible untrustworthiness of information. In general, current challenges will include defining, establishing, and incorporating the usage of newer technology, concepts, and capabilities with existing policies and procedures.

Keywords: Information Sharing, Information Overflow

Introducing Programing Transformations

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Every classroom that uses mathematics in the state of Texas has powerful handheld computers that they use every day for instruction – graphing calculators. This session introduces tomorrow's workshop on addressing and demonstrating algebraic transformations through programming logic and structure on the TI-84.

Keywords: calculator, STEM, transformations

Implementing Free Flash Drive Software for Student Mobility and Academic Success

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The presentation will demonstrate how to install, configure and use freeware and open source software modified to work independently on inexpensive USB flash drives. This frees the student to use virtually any available computer to 1) create documents 2) store them on this same flash drive and then 3) backup files using Web 2.0 technology.

Outline

I. Introduce Flash Drive / Removable Storage Media
- A. What they are.
- B. Overview of Uses

II. Introduce Open Source Software and Portable Applications
- A. What open source software and applications are
- B. Benefits and Risk
- C. PortableApps Suite of applications

III. Putting It Together / Setup.
- A. Installing PortableApps
- B. Configuration of anti-virus, e-mail, calendar, browser and password manager software
- C. Integration of PortableApps software with Web 2.0 applications

Keywords: Flash Drive, Portable Freeware, Privacy

Software Design – 2010 Primer

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This paper outlines and examines the state of software design in 2010. It offers the reader a primer on software design and covers the benefits of good design, drawbacks of poor design, overviews the major challenges to good design, and categorizes the major strategies for design creation. In addition, known design principles that have held for over 25 years are presented. The paper also covers the compositional makeup of a design method in general, the process, the representation, and heuristics, and presents the known set of strategy types used when creating a design from a requirements specification. The paper also provides a categorization of the modeling approaches in use today as well as a categorization of the types of design methods and identifies and overviews five of the more recent promising approaches to software design. The paper points out the current trend among some new methods, such as agile design, to forgo an explicit design modeling phase and to view the code as the design. Such notion of code as design is a new notion, and one that is examined in the paper in light of the history of the challenges and benefits good design modeling has shown to have on the resulting product. This idea is explored, and its benefits and drawbacks outlined. The paper ends with an overview of the newest approaches to design, their placement in the category of modeling approaches defined in the paper and some conclusion about the future of design modeling.

Keywords: Design Principles, Design Strategies, Design Challenges, Design Qualities, Modeling Approaches

Workshops and Tutorials

TUTORIAL
Introducing Services into MIS, Programming and System Analysis Courses

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Services are organizational capabilities for providing value to customers in the form of services that are consumed as they are produced. The objective of this session is to define the motivation for change, relate processes and services, describe key IT services and how services change how we teach IT.

Keywords: IT instruction, IT Services

WORKSHOP
Office 2010 – What's New

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This session will review the changes to the Office product for 2010. This includes the ability to access, share, and edit work from anywhere you have an internet connection; and keep it all safe and synced with Microsoft Office Web Apps. Presentations can be broadcast to any one, virtually anywhere with Web access, without costly or complicated software. Plus much more.

Edit photos in your documents without leaving Word, Publisher, or PowerPoint; Analyze finances at home and work with improved features in Excel; Create dynamic marketing materials with improved photo tools in Publisher.

The new Microsoft Office Backstage™ view lets you save, share, print, and publish your documents with just a few clicks. An improved Ribbon lets you access your favorite commands quickly and customize or create tabs to personalize the experience to your work style. Track and manage e-mail conversations easily in Outlook with Conversation View.

Source: Microsoft.com since the product is to be released this summer.

Keywords: Microsoft Office 2010, Office features

WORKSHOP
Programming Transformations

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The iMPaCT-STEM project is designed to utilize programmable calculators to make dynamic phenomenon concrete and easy to manipulate for STEM and non-STEM students. This workshop demonstrates the power of programming calculators by providing a simple, easy to trace program of a house and asking that it be algebraically transformed using basic changes to the code. The goal of the project is facilitate an introduction to programming in a non-threatening environment while students also acquire a better understanding of STEM content. Programming on the calculators also engages students their learning, while appealing to most learning style preferences. This type of algorithm design is very powerful in that it is accessible to virtually all students and can be invaluable in introducing programming in settings where access to computers is limited and/or students are reluctant to take courses with programming in the title.

Keywords: Calculator, STEM, Transformations

Graduate Student Presentations

Graduate Student Presentations Second Place Winner

Use of Open Source in Education

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We use software every day. Some of these are commercial software while some are open source software. Open source software is that whose source code is available for the user to read and modify in order to enhance the capability of that software. This paper is a meta-analysis of the use of Open Source Software throughout the educational curriculum. The paper begins with the need for open source in the academic field. This is followed by an analysis of the various surveys that discuss how open various source software were used in a particular university as part of an academic project. Surveys are based on the various courses that used OSS, the kinds of open source software used and the manner in which open source was incorporated into the curriculum.

The main focus of this paper is to analyze the use of open source in the educational field and provide any useful suggestions if applicable.

Graduate Student Presentations Third Place Winner

C++ Code Generator for Rod Cutting Problem

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A code generator is presented that can help facilitate the development of programs, for example, the rod-cutting problem within an object oriented programming language. The code generator accepts input from the user in a text file or command line and converts the input into efficient compilable code, for use as C++ function. In this paper we show how the concept of program code generation is accessible to the user directly in object oriented languages, such as the C++ programming language. The motivation is to make the generator part of a program and not of the compiler. It is not required that the user have knowledge of interpreters or compilers, which is quite complex. Thus the generation of the output code is transparent, because we are placing the code generators into the language itself.

Graduate Student Presentations First Place Winner

Implementation of Eye Movement Tracking With Webcam Images

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Most human-computer interactions take place with the common input devices such as keyboard and mouse. This article describes the processes involved in development of a project which explores the possibility of a webcam device acting as a form of interaction device by observing eye movements. Eye movement is tracked by analyzing each frame of the video feed received from the webcam. Considering the circumstances, the project develops a simple game of tic-tac-toe with different levels of artificial intelligence capabilities. The project also involves thread management concepts in order to successfully negotiate steps involved in fetching a webcam frame image and displaying computed location of the eye pupil center.

Undergraduate Student Presentations

Undergraduate Student Presentations Honorable Mention

Solutions for Mexico City's Air Pollution

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With a high infant mortality rate and shortened lifespan of its citizens, Mexico City arguably has the worst transportation caused pollution in the world, largely caused, since the closure of its oil refinery by transportation. The overpopulated streets are congested with traffic consisting of vehicles that are over 20 years old, going nowhere fast and adding to this, the high pollution of diesel powered trucks and busses. The city is geographically disadvantaged by being about 2,240 meters above sea level and located in a crater of an extinct volcano. Its high altitude results in lower atmospheric oxygen levels which cause incomplete fuel combustion engines and higher emissions of carbon monoxide and other compounds. Smog levels are raised by intense sunlight and prevent the sun from heating the atmosphere enough to pierce the cities inversion layer. Among our proposed scientifically oriented public policy solutions are the augmentation and expansion of government solutions in cooperation with the citizenry and corporations of Mexico. We will also explore alternative fuels to gasoline and diesel.

Undergraduate Student Presentations First Place Winner

An Automatic Induction Proof for Program Termination Analysis

Kathlyn Doss

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The termination problem for general programs is undecidable. Hence, automatic methods for discovering program runtime and proving program termination have always been a challenging problem in computer science. Most of the previous symbolic software termination tools are based on predicate abstraction, pushdown model checking and iterative counterexample-guided abstraction refinement, and they are, in general, restricted to safety properties. The Omega Calculator was released in 1995 by Kelly, Maslov, Pugh, Rosser, Shpeisman, and Wonnacott as a tool able to calculate the transitive closure of a relation. In 2005, Anderson and Khoo described an affine-based size change termination technique able to decide the function termination and estimating their runtime. In 2006, the first software model checker for termination, called Terminator, was released by Cook, Podelski, and Rybalchenko.

This work represents an automatic method that tests for termination of modulo-case functions by conducting a mathematical induction proof. The tool takes a modulo-case function and builds an execution trace tree from its inverse. Based on this execution trace tree, a polynomial is computed to estimate the level of tree that labels numbers for which the termination is proved. Using a powerful symbolic computation method, inductive proofs for termination are successfully generated by our tool. This work is supported by an efficient Java implementation of this algorithm tested on various modulo-case functions. Since the existing tools for program termination, such as Omega Calculator and Terminator, are not able to provide a proof for termination for our benchmark examples, we consider that our technique is promising.

Undergraduate Student Presentations Second Place Winner

A Literature Review of Computer Science Education Through Video Game Creation

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In order to increase the number of students entering the computing field, we need to increase their interest in computer science. Unfortunately, the stereotypes that surround the computing field deter groups such as women and minorities from considering computing as a career choice. One method researchers have implemented in combating negative stereotypes is introducing computing through gaming. By teaching students through game development, teachers continuously engage students, and students have fun. In this work, we present a review of research in the use of game programming as a teaching tool. This includes a survey of the different environments that are used, their pros and cons, and the metrics that were used to measure the success of the materials, if applicable. We survey materials that use programs such as Greenfoot, and Gamemaker, as well as other available platforms. The data gathered from this literature review can be used to assist future development of teaching materials that engage students.

Undergraduate Student Presentations Third Place Winner

HIV/AIDS Problem in Shanghai

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Shanghai has reposted nearly 4.000 new HIV/AIDS cases in 2009, including 936 new victims. It is a startling increase of 34.1% from the previous year. Such a percentile upsurge suggests a dire problem. Behind the reasons of rising numbers is Shanghai citizenry's lack of knowledge about disease prevention. While in the United States HIV/AIDS education is compulsory and comprehensive, in Shanghai children leave school knowing virtually nothing about these diseases. As the migrant population increases, there are also parallels between sexual harassment and lack of protection of the female contract recruits in the Shanghai industrial region and the spread of HIV/AIDS. Teaching safe sex and promoting the availability of condoms have proven to be effective methods in combating the disease in Brazil, Kenya and Thailand. With cultural sensitivity we can import best practice solutions to HIV/AIDS growing health problem in Shanghai from both Asian and non-Asian public health initiatives, while measuring their success. In addition, with proper education and prevention, we can develop a solution matrix that reduces the number of HIV/AIDSA cases globally and develops a protocol for culture-bases sensitivity, thus saving the lives of many individuals which could ultimately make a positive impact on the future of Shanghai. We will discuss our research methodology and computer software we utilized to arrive at our findings.