Association for Computer Educators in Texas (ACET)

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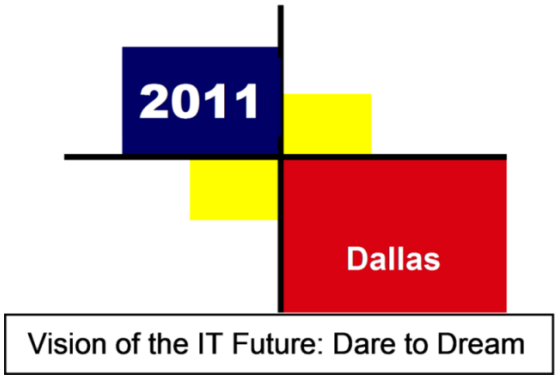
Proceedings of the 47th Annual Conference



October 6 – 8, 2011

Dallas, Texas

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MATLAB for Programming

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MATLAB was initially designed to simulate numerical calculations in linear algebra. However, since its inception, its capabilities have evolved significantly. The newer versions of MATLAB have functionalities capable of performing high level numerical computations. It can also be used as an environment in which to write programs. The goal of the presentation is to demonstrate how to introduce students to algorithmic thinking for problem solving and use MATLAB to implement the algorithms. Its interactive environment makes it convenient for teaching the three basic concepts of programming: sequencing, selection, and repetition. Although MATLAB would not be the program of choice for large applications such as operating systems or designing softwares, we will use its essential core, which is a collection of tools to manipulate vectors and matrices, to demonstrate the three basic concepts needed most frequently to write programs. In particular, we will introduce an approach to problem solving that uses the following format: (1) State the problem, (2) State the given input and the expected output, (3) Develop a solution to the problem as a sequence of steps to take the input and get to the output, (4) Implement the steps in MATLAB and solve the problem, and (5) Test the solution. Although mastering MATLAB may take years, we propose to introduce the software to establish algorithmic thinking and problem solving in a simple and easy manner based on our experience of using the software to teach programming courses.

Keywords: MATLAB, algorithm, interactive environment

Building a Computer Science Repository of American Sign Language Signs for Deaf and hard of Hearing Students

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Education for Deaf and Hard of Hearing (D/HH) students in Science, Technology, Engineering, and Mathematics (STEM) domains, and specifically Computer Science (CS) education, represents a top national priority. This project assures equal access as outlined by the Americans with Disabilities Act Amendment of 2008. CS course instruction for D/HH students is traditionally presented with mediated instruction, which involves human sign language interpreters. There is a shortage of qualified interpreters across the country (e.g., approximately 90 vacancies in the public school system in Texas). Students in STEM courses frequently receive either unqualified interpreters, interpreters unfamiliar with complex CS concepts.

The project describes the methodology of a concurrent translation of text-based teaching materials into American Sign Language (ASL), and develops an ASL Dictionary (ASLD) with signs for the new CS concepts. This project provides a resource to students prior to class sessions, to access a database of specialized CS terminology not otherwise accessible, and to review course materials after class in a personalized and direct instruction format. Students can access the relevant CS concepts through ASLD.

The project shows how to design and record signs by the human interpreters for the CS related words that are not yet available in the ASLD. In order to create an online repository of CS terminology in ASL, the avatar signs are validated by the Department of Deaf Studies and Deaf Education. Our project meets a great need to retain and graduate students in the CS field.

Keywords: Computer Science education, Americans with Disabilities Act Amendment of 2008, American Sign Language, Dictionary

Challenges and Opportunities to Improve Quality of Data

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As organizations expand use of technology driven systems and applications, decisions are increasingly driven by data feeding in from a multitude of sources. However, data quality issues plague organizations of all sizes.

This session will focus on several challenges with data quality and steps that organizations can adopt to institute positive change to fact based decision making.

Keywords: data quality, data quality issues

Interactive GIS Mapping in a Dynamic World

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The use of two, free, Geographic Information System (GIS), web-based mapping programs is demonstrated. Similar looking and functioning tool bars allow a user with minimal to advanced computer skills to transfer skills among applications. Easy to use tools for map navigation focused zooming and pop up screens minimize the effort to access data while maximizing lots of map layers. Multiple layers prevent data clutter and allow integration of ideas customized to the learning rate of a variety of students. Graphics and visualizations clearly show the local, regional, as well as the world wide relationships of events for your science curriculum.

One program, maintained by the U. S. Geological Survey (USGS) is useful for introducing GIS concepts to multiple levels of computer skills users. A lesson plan demonstrates navigation, layer selection and user friendly data query techniques. The final map may be emailed to the instructor.

A second program taps a wealth of Earth Science data to map the distribution of several environmental hazards. Bookmarks, labels, theme depicting placemarks, popup notes and links to online foreign press articles and web shared videos capture the environment during and after the hazard. Presentations may be captured in an editable, interactive slide format and the map stored on a provided secure group site shareable on the internet with group permission.

Numerous smartphone science apps are available and can be displayed with an overhead projector – a great tool to involve students in science presentations. Demonstrated is an app which captures USGS data and allows data querying.

Keywords: GIS, earth science, interactive mapping, smartphones, lesson plans

The Future of Social Networking

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Social networking web sites such as Facebook, Twitter, and Second Life are viewed as providing both the access to vast audiences and potential increase in social capital to users. Today, individuals tend to invest in a single social networking site, such as Facebook, never taking advantage of capabilities other social networking sites offer and resulting in less social immersion than possible. This paper evaluates capabilities in social networking sites as they converge to offering similar capabilities within single locations and the impact of convergence on education delivery.

This topic is important for educators to become involved with one or more social networking sites as their students are all using them. Teachers will need to change their mode of working and communicating with students over the next ten years from essentially teacher-centric presentation to student-centric learning with mentoring by the teacher. This shift is already taking place in college-level on-line courses and will move lower in the education system as pressure to reduce costs and 'do more with less' prevail in U.S. education. To enable the change in how teachers interact with students, teachers will first need to learn the various capabilities and functionalities offered by a variety of social networking sites so they can incorporate new functionalities from convergence as they occurs.

Keywords: Social networking, Virtual worlds, Web 2.0, Education 2.0

A Machine Learning Approach to Time Series Forecasting: Developing a Military Threat Prediction Tool

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Time series prediction techniques have been used in many applications such as financial market prediction, utility load forecasting, and weather prediction. This work surveys machine learning techniques for military threat level prediction, focusing on predicting casualty levels of friendly forces. Time series prediction implementation is categorized as challenging because the system is nonlinear, non-stationary, and not defined a priori. In addition, during the literature review, time series prediction problem specifically implemented as a military threat application is not been well reviewed. In our experiments we have explored both multilayer neural network and support vector machine classifiers using the WEKA graphical user interface tool. In addition we will investigate our data and do extensive preprocessing to enhance computational and prediction performance. WikiLeaks is an online media organization which leaks news and information to the public while keeping the identity of their sources anonymous, providing a universal way for the revealing of suppressed and censored injustices. In 2010 they posted online large data dumps detailing events in Afghanistan and Iraq. The Afghan and Iraq data dumps will be used as training and testing data for this project

Keywords: support vector machine (SVM), neural network, time series forecasting, wikileaks

Real-Time Detection of Stepping-Stone Attacks

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A common technique hackers use to break into a computer host is to route their traffic through a chain of stepping-stone hosts. There is no valid reason to use a long connection chain for remote login such as SSH connections. One way to protect a host of being attacked is to identify long connection chains connecting into the host. This paper proposes the real-time stepping-stone detection software which uses a novel method to identify long connection chains from short chains using a pre-computed short chain profile. Each new connection will be compared to the profile at real-time. Any connection that differs significantly from the profile will be alarmed as a suspicious long connection.

Keywords: Intrusion Detection, Stepping-Stone, Security, Real-time

Contextualizing Math and Science with Elementary Programming

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The iMPaCT-Math project endeavors to simultaneously increase math understanding and engagement with programming through the infusion of elementary graphical programming exercises into conventional high school math courses. The first-phase pilot study was dramatically successful. High-stakes math testing demonstrated dramatic improvements in math learning, and one fourth of attendees voluntarily elected to attend an elective course in computer programming. This year's second-phase experiment will introduce approximately 1000 high school freshmen to programming within their "Algebra 1" classes.

The lessons for the second phase experiment utilize the programming environment within widely used TI calculators. An alternative programming environment has also been developed by Microsoft as a Silverlight applet that is compatible with most browsers.

This hands-on presentation will introduce participants to iMPaCT-Math pedagogy and lessons. Participants are encouraged to bring laptops whose browsers include the Silverlight plug-in.

Keywords: introductory programming, math, iMPaCT-MATH, iMPaCT-STEM, computational thinking

Obtaining Funding for Education Research

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There is substantial need to improve the preparation of our nation's workforce for meaningful engagement with programmed computation. Many students avoid ever attending a programming course, and attrition is high from academic programs in computer science. The NSF and other agencies will fund well-designed research projects that address these challenges.

Successful research proposals clearly identify critical challenges and propose promising, sustainable and replicable interventions. They must also propose a relevant evaluation strategy, and an effective dissemination plan. This presentation will review these primary characteristics of successful (and sustainable) research efforts that achieve significant impact.

Keywords: STEM-Ed, CSE, intellectual merit, broader impact

Incorporating Cloud-Based Resources in Teaching

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Technology plays a vital role in teaching and learning across the curriculum and in various disciplines. Use of the latest technologies, tutorials, simulations, apps, and tools in face-to-face, hybrid, and online courses provides for a rich and interactive environment where teaching is facilitated and learning is enhanced. Unfortunately, with the poor state of the economy and serious, across-the-board budget cuts, it is difficult to purchase new technologies to augment teaching resources or to provide innovative ways to engage students in learning. Fortunately, there currently exists an array of free or low-cost interactive, innovating cloud-based tools, apps, simulations and tutorials for use in introductory- to advanced-level courses both in the computer education field and in other disciplines.

For example, *Google Apps* provides a number of free downloadable applications including *Google Mail, Google Calendar, Google Sites, Google Earth, Google TimeLine, Google Wonderwheel, Google Docs* and other collaboration tools. Furthermore, *Google Apps Education Training Center* provides online training on use of its various apps in education. These apps can easily be included in any course regardless of discipline, course delivery mode, or course level.

Moreover, *Android for Academics* for keeping attendance, grade book, chart, and grade rubric and ticker; *Wolframalpha* used as a search engine and in mathematics education; *join me* for sharing computers and conducting online meetings; *Windows Live* for online storage and sharing Microsoft Office documents and photos; *Doodle* for easy scheduling; *3 schools* for web development education and certification; *Creative Commons* for learning about online course development; and *Hoot Course* for class conversation online are other examples of the free or low-cost cloud-based apps that could supplement teaching resources to engage students and enhance their learning.

Key Words: Cloud-Based Resources, Apps, Simulations, Tutorials, Education

Knowledge Management Model for Information Systems' Students

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Students who are majoring in Information Systems need to keep up with major progress taking place in the business world. Knowledge management is one of these valuable movements. Organizations are keeping track and trying to tap into this invaluable wealth of their intellectual capital, that is, knowledge. This presentation will show a work in progress for an existing model for knowledge management that is fluid by nature. The author has been working on this model for the last eight years. Unless an Information System worker understands the implications of knowledge and its ability to organize, sift, mine, disseminate and share knowledge, there will be little chance to compete, solve problems, communicate and understand these major changes in the business world. The presentation will discuss two types of knowledge: explicit and tacit. Explicit knowledge is easy to codify and share, however, tacit knowledge is very challenging to access since it resides in peoples' heads. This paper shares some of the things we need to do in order to foster tacit knowledge allotment and dissemination. Also, information systems are an invaluable and strategic asset, they are still considered mostly as a tool to automate our processes. The model will cover other non-technological factors that will affect the success of the failure of building a knowledge management program. If we gain anything from knowledge management, it will be to value the human component as the most important component in any information system.

Keywords: Knowledge, tacit, explicit, Information Systems

Privacy Issues in Published Data with R

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When the Census Bureau publishes data, how does it determine which fields to include? There are several measures of privacy to consider. We will also show an interactive R program to select privacy measures.

There are many privacy issues with publicly available data. Several measures of privacy are discussed. We have produced an R function to take data sets and produce the abbreviated version of the set which would be suitable for publishing.

Keywords: statistical computing, R, privacy

Using R for Maps for the Android and iPad

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We use the statistical language R for many analyses. But we have written a function that will take a data set with longitude and latitude coordinates and produce a map suitable for Google Maps. The R statements build the Keyhole Markup Language (KML) file which is loaded into a Gmail account. Once there, the map can be accessed from Android and iPad devices.

Keywords: statistical computing, R, maps

IT Pedagogy: Sharing Best Practices

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There will be a discussion regarding difficult situations in online, hybrid and ITV classes. Some topic examples include: posting of clear and adequate directions, timeliness of responses and grading, quality of communication (verbal and electronic), and a comparison of handwritten work vs. computer submissions. Audience participation is encouraged.

Keywords: pedagogy, education, online classes, hybrid classes, ITV classes

Developing Teaching Expertise in the Area of Quantum Computation and Nanodevices (QCN)

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A revolution has begun in computer science, engineering and technology, based on the ability to organize, characterize, and manipulate matter systematically at the Nano scale. Far-reaching outcomes for the 21 century are envisioned in both scientific knowledge and a wide range of technologies in most industries, healthcare, conversion of materials and energy, biology, environment, and education (Program Solicitation NSF 10-536). See also, The First International Symposium on Nanotechnology, Energy, and Space, October 2009, NASA, Houston).

To respond to this need we have created two courses: one in Quantum Mechanics, and one in Quantum Computation & Nano Devices. Students worked on projects such as Nano Carbon Tubes, Transistor made from Carbon Nano Tubes, Quantum Dots, Quantum Gates, Quantum Circuits, Quantum Algorithms, Error Correcting Codes. The students presented homework problems, presented their projects, and got involved in classroom discussions. We need to build on others innovation and research in science education. See in particular, “How people Learn”, by Diana Maugnan.

It is of highest importance to develop technical courses, web pages, and textbooks that motivate and create a positive experience for students. Furthermore, we need a classroom atmosphere that is student friendly & nurturing, (NSF Report “Shaping the future, Seymore & Hewitt 1944).

The advancement and future wide use of nanodevices, the pending creation of quantum computers, and the fact that a nanodevice functions like a quantum computer make it is also a necessity to develop faculty teaching expertise in this area, and write a student friendly textbook on these topics.

A revolution has begun in computer science, engineering and technology, based on the ability to organize, characterize, and manipulate matter systematically at the Nano scale. To respond to this need we have created two courses: one in Quantum Mechanics, and one in Quantum Computation & Nano Devices.

Keywords: Nanodevices, Quantum Computer, Quantum Computation

Roundtable: The Use of Social Media as a Communication Strategy with Our Students

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Our students utilize social media as a major communication tool. Should we join them? Are any of the social media options appropriate for use as communication tools by faculty? What are your opinions? How do you use Twitter, Facebook, Linked-in or any of the other options to keep in touch with your students?

Keywords: social media, communication, linked-in, Twitter, Facebook

Windows 8??

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This session gives a pre-view and introduction to the new Microsoft Windows 8.

Keywords: Microsoft Windows

Competitive Programming, Contests and Conquests

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All CS graduates should be able to program well, but there isn't time within a 4-year CS curriculum for students to learn to program well AND implement many of the important algorithms and data structures that most of us believe are vital to future success. Contests and competitive programming courses provide means to achieve a broader curriculum with student enthusiasm as the driving force. But how do we get them enthused?

Keywords: programming, programming contests, competitive programming

Roundtable: What the Best College Teachers Do

Jackie Porter

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This is a summary of Dr. Ken Bain's book titled "*What the Best College Teachers Do*," Professor Porter will summarize the book and examine the "Power of the Question," as it relates to our discipline and our teaching. The participants will be invited to brainstorm the methods they use to gain and sustain students' attention in their class. They will share ideas of how they are able to facilitate student learning and avoid being the "sage on the stage," (http://www.questia.com/googleScholar.qst?docId=94305197) and become the "guide on the side."

The presenter will lead the participants on how to engage students in the learning process and to make the students more active learners as Dr. Bain's book suggests. This can be done in different ways using different methods including lectures. The workshop emphasizes that lectures is not a bad thing, but for better retention and for mastery of the subject is the most efficient time a combination of pedagogical method is best for the diverse groups of students that most classes are made. This allow for efficacy of the teacher to better reach all of the students and focus teaching on those that may need more coaching in the learning process.

Keywords: Teaching, Learning, Pedagogy, Engaging, Provocative

The Social Network Hiatus

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Social Networking has become trendy and well accepted as a communication medium. Such media are highly popular among the younger generation and others of a somewhat different age. These more youthful users, sharing information and interacting with others, might be referred to as the social network generation. The purpose of this study is to examine the impact of the rapid developments in social network technologies and online communications on the older generation.

The Social Network is the use of the World Wide Web to promote the exchange of information and provide users with a convenient method of interacting with others; providing individuals the ability to communicate and share common interests. The availability and popularity of Social Network attracts and captures the attention of users in the early stages of their life. Their usage of this technology becomes embedded in their daily activity; forcing, as a practical matter, parents to become familiar with the technology in order to maintain relationships and communicate. These trends, in general, are challenges to the older generations regarding the usage of newer technology, concepts, and capabilities.

Keywords: Social Network, online communication, bridging generations

Cognitive Sequence of Programming Languages

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This presentation will look at Piaget's cognitive development theory and how it can be applied to the different types of programming languages. Research suggests that different programming languages fit best with a specific Piaget's stage.

Piaget's cognitive development theory presents four sequencing stages. Here is a summary of these stages and the corresponding programming level:

1. Sensory, -a stimulus/response reaction
   (none applicable)
2. Pre-operational, -use symbols and language
   Data entry
3. Concrete Operational, -judge observable phenomena
   Understand code, able to use Visual/Script languages
4. Formal Operations, -abstract thinking
   Able to create/develop code using procedural or object oriented languages

These stages develop at different rates and maturate at different ages.

The educational implications are a need for matching cognitive development with a programming language. This assures success.

Keywords: Piaget, cognitive development, programming languages

The Future of Internet Security – Ipv6

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Because of a global economy, information is being distributed globally. Along with is development, security issues have raised. The Internet was developed within a secure system of the U.S.A. military. Hence, security was not considered. When the Internet protocols became public and used openly, malicious activity developed. Examples of such activities are: eavesdropping, spoofing, Denial of Service (DoS) attacks, session hijacking, viruses, worms, and Trojan horse. Many of the DoS attacks use the broadcasting features of the Internet to flood a victim's web site. An example of such attack is the Smurf attack.

To counter the communication security issues, IPsec was developed. This protocol added two headers to the packet; Authentication Header (AH) and Encapsulating Security Protocol (ESP) for encryption. These features have been built into a new protocol IPv6.

Another problem is broadcasting and the shortage of addresses in the old protocol. IPv6 has a new addressing format that provides more addresses, a better address structure, and no broadcasting.

Once IPv6 is fully implemented on the global Internet, the Internet will be more secure.

Keywords: IPv6, Authentication, Encryption, Addressing

Global Assurance

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Because of the Internet, information is no longer confined to a local physical area like a locked computer room and accessed by only computer professionals. There is no longer a perimeter to protect. Today information is distributed throughout the globe. It can be accessed by anyone, anywhere, anytime. Malicious code, cyber attacks, Denial of Service attacks, and spam are originating worldwide. What is now needed is global assurance.

Global assurance is defined as "the global collaboration of governments, ISP's, search engines, and businesses to ensure the integrity and confidence in the use of the Internet" (White, G. (2010). The Evolution and Implementation of Global Assurance. *Issues in Information Systems, 9* (1), 35-40).

Today, there is no perimeter to protect. The identity and location of the enemy are unknown. The leaf objects (data files, programs, databases, hosts) of networks now need to provide their own security. Firewalls and Intrusion Prevention Systems alone can no longer provide assurance.

This is the next step for information security. Along with the new challenges for confidentiality, integrity, and availability; there are now needs for accountability, authentication, non-repudiation, confidence, functionality, and resistance to intentional by-pass.

Keywords: Security, assurance, global, information

The OSI Model for Networks

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A network of networks, the Internet, is growing. Everywhere in society, a network of networks is taking hold. Knowing how networks and the Internet works is and will be as important as knowing how cars or telephones work. When IPv6 becomes the standard protocol of the Internet, all electrical devices can or will be connected to the Internet. The phone, TV and computer along with all electrical appliances will be connected to an Internet Service Provider. This is what IPv6 will allow. Many experts believe IPv6 will become the standard for the Internet in ten years.

Because the Internet will have a major impact on society, it will be important that all understand how it works. The International Organization for Standards (ISO) developed a model called Open Standards Interconnection (OSI) to help organize the structure of networks. Such a model makes it easier to understand how networks operate and helps in setting standards to insure compatibility between networks. It is through this model that new technologies will develop on the Internet

At the end of the presentation, attendees will understand the architecture of networks, the Internet, and be able to identify specific network components in relation to the OSI model. Finally, attendees will have better insight as to the future of the Internet.

Keywords: Internet, Networks, OSI Model

Workshops

Workshop:
An Educator's Introduction to the Free MySQL Through a Graphical User Interface

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Free graphical user interface tools have made data storage and retrieval much easier for the novice than ever before. MySQL offers a free version that is more than sufficient for most educators. Database has become an important need to web designers, educators, and administrators. This presentation/workshop will be supported by more than half a dozen step by step tutorials (containing many graphics) which participants may download and access in the future.

Participants will learn to create databases, tables, and queries using tools that are much friendlier than the typing of text commands.

Keywords: Database, MSSQL, GUI, Introduction to MySQL

Workshop:
ASP.NET Programming

Mary Myers, PhD

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This hands-on workshop will allow attendees to quickly learn ASP.NET. The basics will be discussed. Differences from other languages will be included. This workshop is designed for those familiar with programming in any language.

Keywords: ASP, ASP.net, programming languages

Workshop:
Lego Robot

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This workshop will allow attendees to build Lego® robots and explore how they can be used to teach programming to students. Lego® Robots are an interesting tool to use in a Programming Logic and Design or Introduction to Programming course.

Keywords: Lego® Robots, programming, logic

Undergraduate Student Presentations

Undergraduate Student Presentations: First Place

Remote Manipulation with a Visualization Cluster

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The Vizwall, a 12 monitor visualization cluster, controller was designed to solve a common problem with using any sort of visualization software for presenting to an audience, letting the end user(s) have a seamless and simple way to interact and use the software to suit their needs. The flaw lies in that anyone displaying their model/data will have to sit at a frontend and not be physically engaged with the Vizwall with other students/collaborators. With this problem, we chose than an iPad would be a simple and common device that most people would have an easy time adapting to using. The iPad has an easy framework to work off of and a good portion of the population will have some experience with an iOS device, so swiping and pinching gestures would either be second nature or easily learned and used by any new end users. We then created the application to directly interact with the mouse of the frontend of the Vizwall allowing compatibility with multiple applications and ease of use through Linux's X windowing system. With this application, it'll allow students of any disciplines to interact and teach through a new visualization medium such as 3-D models and large scale displays with relative ease and will promote the usage of computers and 3-D models as excellent ways to relay information.

Keywords: iOS, Linux, 3D Models, Remote Interaction, Visualization

Undergraduate Student Presentations: Second Place (Tie)

Applications of Computers in Architectural Design – Computer 3D Modeling and Rendering Process

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The application of computers in the field of architecture is vast and is constantly changing. The senior-level architecture studio project scope was to design a Texas Tech University Mixed-Use Center in Seville, Spain. The project specification required a minimum area for classrooms, student lounge, and faculty and administrative offices of 11,455 square feet. In addition to using **Google Chrome** for preliminary research, I used various software including **Microsoft Word**, **Microsoft PowerPoint**, **Adobe Photoshop Creative Suite 5 (CS5)**, **Adobe Illustrator Creative Suite 5 (CS5)**, and **Rhinoceros V4 and V5 (NURBS 3D modeling program)**. In the presentation, I will explain how computers facilitated the process of design to create a render.

Keywords: Render, Rendering Process, Architecture, Computer, Software

Undergraduate Student Presentations: Second Place (Tie)

A Threaded Case Study

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The Threaded Case Study allows the student an opportunity to apply valuable skills that they have attained and practice throughout their studies leading to the completion of their certificates and/or associates degree. The Threaded Case Study is design to give the students hands-on, practical experience to apply the knowledge and skills attained in there Cisco studies to a real life networking example.

The students will work as a team to assess the case study needs. The student team will apply project management, time management, resource management, communication, and interpersonal skills in completion of the project.

Keywords: WANs, LANs, and Wireless Networking Technologies