

People who say it can't be done,
should not interrupt those who are doing it.



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To understand recursion, one must first understand recursion

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About ACM



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Schedule of Events

TIME	EVENT
9:00 AM	Opening Speech
9:15 AM	Carlos Magaña
9:30 AM	Christopher Gonzalez
9:45 AM	Dominic Fernandez & Mario Maldonado
10:00 AM	Daniel Gamez
10:15 AM	Break
10:30 AM	Erik Gomez
10:45 AM	Roberto Cruz
11:00 AM	Michael Fuller & Eric Trevino
11:30 AM	Maria Torres
11:45 AM	Lunch
1:00 PM	Keynote Speaker
1:45 PM	Nicholas J. Norris
2:00 PM	Rolando Rodriguez
2:15 PM	Dustin Hickey
2:30 PM	Judging & Awards
3:20 PM	Closing Speech
3:30 PM	Social

Chair's Welcome Message



DEPARTMENT OF COMPUTER SCIENCE

THE UNIVERSITY OF TEXAS - PAN AMERICAN

1201 West University Drive • Edinburg, Texas 78539-2999 • Office (956) 665-2320 • Fax (956) 665-5099

Welcome to the Ninth Annual UTPA Computer Science Student Research Day (CSSRD)! Thanks to the hard work of our ACM student members, this event will provide a forum for you - young engineers, scientists and scholars from the Rio Grande Valley and beyond. CSSRD is for you to present and share your research findings in Computer Science, and to exchange ideas of your future research endeavors. It is our wish that your participation in this event will leave you with a solid footprint at the early stage of your bright future career.



We are very proud that many students have been actively involved in research with faculty members. Some have published their research results in professional conference proceedings and/or journals.

Thank you for your interest in this event. We will be delighted to count with your participation, and I look forward to meeting you at the conference.

Zhixiang Chen, Ph.D.
Professor and Chair

Designing and Implementing an Electronic Recording



Author: Dustin Hickey

Advisor: Dr. Christine Reilly

An Electronic Recording (E-Recording) system is used to send and receive real property records to County Clerks across the nation. The creation of this system has allowed customers to record documents with shorter turn-around time and less overhead. LandtitleUSA currently provides an E-Recording gateway that allows customers to submit documents to numerous counties across Texas. This system, although functional, has some drawbacks which make E-recording frustrating for both customers and support staff.

The currently operating E-Recording system has many deficiencies that make the creation of a new E-Recording system necessary. Some of these deficiencies include old and hard to edit code, system breaking bugs, no direct county integration, and time consuming support. These shortfalls along with others makes the creation of a new E-Recording system viable.

This project is broken up into three phases. The database creation and conversion, the E-recording county request and response handler, and the customer front end. The database creation and conversion phase involves creating a new database that addresses the shortcomings of the original database. This includes database normalization, adhering to the Property Records Industry Association (PRIA) version 2.4 standards, and better relational mapping to help create a dynamic environment for customers.

The next phase of the project is the creation of the county request and response handler. This service facilitates the transfer of documents between the customers and the counties. This service uses XML Schema Definition (XSD) files provided by the county and Java Architecture for XML Binding (JAXB) to create transaction requests and responses. This service generates an Extensible Markup Language (XML) file based on the requirements of the county and the information provided by the customer. It also translates and inserts response XML files into the E-Recording database.

Phase three is the creation of a customer front end. The front end will allow customers create E-Recording packages, add required information, submit and receive documents, and check on the status of the current packages. The customer front end follows a Model-view-controller (MVC) approach and is built with Java Server Pages (JSP) and Spring Framework. This allows users to quickly and easily receive and update information, and makes updating and adding code much more manageable.

By implementing this new E-Recording system, it will allow us to more easily support customers, increase revenue by submitting directly to counties, have much more manageable code, and allow for more frequent updates.

Analyzing University Research Trends Using the DBLP Computer Science Bibliography



Authors: Rolando Rodriguez

Advisor: Dr. Wendy Lawrence-Fowler

The DBLP is a computer science bibliography website that lists over two million research articles on computer science, information sciences and information technology. Despite the impressive amount of articles, the DBLP website provides only limited search capabilities. Although there are some existing systems which offer more robust querying capabilities, there are no systems which provide specific analysis of research production of university computer science departments. To address this issue, we design and develop an XML database that imports the DBLP publication dataset in XML format and features a web-based interface with more expressive querying, analyzing and reporting capabilities.

My system will take query information from the user and use it to automatically generate XQuery queries so the user can retrieve information from the database. After receiving article information from a specific university, this data is then broken up and analyzed for key terms to find out which CS topics are researched more frequently. Since titles of articles usually contain information of the topics being covered, we can compose an analysis of a CS department's research trends. After compiling a list of these trends, the data is then used to create visualizations to facilitate data analysis.

The goal of this system is to produce analysis of research production trends which can be useful to university CS departments for reasons such as using it to discover which topics their research focuses on, to create analysis reports of their research production, and it can be useful when hiring new faculty. Because my system focuses on querying information of authors from specific universities, my system provides a unique experience that other computer science bibliography-querying systems do not offer.

ACM's Message & Judges



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Welcome to our Ninth Annual Computer Science Student Research Day! CSSRD provides students the opportunity to present the accomplishments of their hard work and research.



The purpose of CSSRD is to provide students with the opportunity to showcase their projects. Undergraduate students will be presenting their senior project work. Senior projects are chosen by the students, but must be approved by an overseeing faculty member. These projects are an opportunity for Computer Science and Computer Engineering students to showcase their knowledge and apply it to a current issue in society. This year we will have 11 students presenting their current work.

I am very honored to have had the opportunity, as the President of ACM, to be able to continue on the tradition of CSSRD. Our students along with their faculty advisors have worked hard on their projects and deserve the best in their future endeavors.

David N. Chavez
ACM President

Judges



Mr. David Egle



Dr. Andres Figueroa



Mr. Eric Martinez

Keynote Speaker: Jacquelyn Michel

Jacquelyn (Jackie) Michel is the first Director of Technology Transfer and Commercialization at the University of Texas at San Antonio where she is responsible for policy formation and implementation, management of the technology portfolio portfolio, including both licensing and facilitating inventor start-ups, and budget oversight for UTSA's Office of Commercialization and Innovation.

Prior to joining UTSA, Ms. Michel served as The University of Texas – Pan American's first Director for Innovation and Intellectual Property. She was charged with identifying, capturing and leveraging the intellectual assets produced by UTPA's human capital. She worked to create a culture supporting disclosure of technologies, implemented processes and procedures for capturing, protecting, licensing the first technologies and to foster understanding and success for technology based economic development by forming partnerships and working closely with regional stakeholders. She participated in the development of many UTPA institutional and regional collaborative proposals resulting in awards of over \$15 million. On behalf of UTPA, she co-founded the first company based on UTPA technology, FibreRio Technology Corporation.

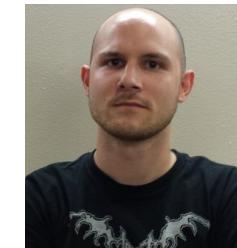
Ms. Michel was formerly Director of IP Consulting for Aurigin Systems, a Silicon Valley start-up software company specializing in software to support the management of intellectual assets in Fortune 500 companies. She worked with company R&D teams, business teams, in-house counsel, M&A groups and company executives on projects measuring, creating and extracting value from intellectual property for pharmaceuticals, agriculture, biotechnology, chemicals, consumer goods, semiconductors, telecommunications and the oil industry. Following the sale of Aurigin, Ms. Michel joined Intellectual ASSETS, Inc.™ and provided technical, market, business and strategic planning elements to improve business alignment and successful commercialization of technologies for clients.

In a 25-year career in the pharmaceutical industry, Ms. Michel held numerous positions in the pharmaceutical and life sciences industry. She was Pharmacia's Corporate Director of Intellectual Asset Management (IAM), reporting to the Senior Vice President of R&D. Ms. Michel served as Director of Monsanto Life Sciences IAM group and was directly responsible and accountable for expediting out-licensing and for significant fractions of market capitalization of the Monsanto IP portfolio and served as the liaison to the Nidus Center for Scientific Enterprise (a Life Sciences Incubator). She successfully implemented processes and tools for creation and extraction of shareholder value from IP and transformed the IAM group from a cost to a profit center through licensing for non-strategic technologies.

Ms. Michel transitioned from being a research scientist to creating methods for portfolio analysis for Searle's R&D organization from ideation to product. She implemented Searle's competitive technology intelligence program and their knowledge management program. She has worked in a variety of areas in the life sciences/pharmaceutical business arena including strategic planning, technology intelligence, market analysis, decision analysis, promotion response analysis, international marketing, and new technology assessment.

Ms. Michel holds a bachelors degree in biology from Southern Illinois University, a certification in clinical pathology from Jewish Hospital, Washington University School of Medicine, a board certification from the American Society for Clinical Pathology as well as a masters degree in management (marketing) from Maryville University. She has completed formal training in project management, decision analysis, statistical analysis, competitive intelligence, technology intelligence, licensing, strategic planning, market research, promotion response analysis, valuation, cradle-to-grave portfolio modeling for opportunity ranking for pipeline investment decisions, knowledge management and organizational redesign. Ms. Michel is a member of the Licensing Executive Society, and the Association of University Technology Managers and the National Business Incubator Association.

Web Security Using AES



Author: Nicholas Norris

Advisor: Dr. Wendy Lawrence-Fowler

In the growing world of online transactions, many people have become concerned with their information being secure. There are many ways to go about protecting information online with the most widely used implementation being strong encryption algorithms. Encryption allows for a secure way for two parties to talk by using a secret passphrase to determine whether or not the person asking for the information is in fact the right person. For this design I have chosen to focus primarily on the AES or Advanced Encryption Standard algorithm to show how encryption works as well as how it can be implemented in a website server. One of the main points for this design will be to show how the data is stored in a database. The data itself will not be stored in plaintext but rather in what's known as ciphertext meaning that the data is encrypted. The reason why the data itself will be encrypted is so that if the integrity of the website is breached, then what is stored in the database will still be unreadable unless the attacker has the key for the algorithm. In addition to that, the site itself will be running an HTTPS or Hypertext Transfer Protocol Secure which uses another form of an encryption algorithm to securely protect the traffic from the website itself.

The presentation will consist of two things: A powerpoint detailing the main properties of AES as well as how the algorithm goes about encrypting the data. This will show all of the steps the algorithm takes as well as show how the data becomes ciphertext. In addition to the powerpoint will be a short demonstration of the algorithm in action showing how the algorithm both encrypts and decrypts data on a mock website.

MOSTHistory ReservationMaker: Creating a New and Improved Reservation System for Museum of South Texas History



Author: Maria Torres

Advisor: Dr. Wendy Lawrence-Fowler

The Museum of South Texas History (MOSTHistory) requested the help of the UT Pan American Computer Science department to build a new system to help manage their tour and outreach reservations. The museum's current reservation software, VisitMaker, is old age and no longer supported. In addition, Visitmaker does not take advantage of concurrency in today's windowed environments or provide mechanisms to interface with other running applications.

The approach used to complete this project was the Waterfall Methodology. All stakeholders were interviewed and business processes were analyzed in order to gather the proper requirements for a new software system. During the requirements elicitation process, it was discovered that the MOSTHistory rental and event reservations processes were completed manually. There was a determination made that it was important to keep all existing data available through Visitmaker. A Requirements Analysis Document (RAD) was generated.

A non-functioning prototype was built to help assess the correctness of the identified functional and non-functional requirements. The decision was made to fully replicate Visitmaker's database in the new system to facilitate the migration of all existing data for archival purposes. Due to enhancement in functionality, new schemas were added to the overall database structure.

New functionality of the system includes the ability to save and print confirmation letters as Word documents or reports as Excel spreadsheets, the ability of directly emailing confirmation letter and reports from within the system and finally system to system communication with the LO calendar application, automatically updating reservations as they are created and modified. Additional functionality was identified, but implementation was deferred to a future version. This included public access to request and/or create a reservation for a tour or event.

This new software will be beneficial to MOSTHistory because it will create newer, faster, and more reliable ways to manage and appropriately disseminate reservation information to departments. This will reduce errors in data collection as well as reduce human to human communication of data. It will create a smoother workflow and there will be faster information transfer to crucial departments like bookkeeping and Human Resources. The project will improve overall customer service at the MOSTHistory.

Computer Science Faculty

Dr. Robert Schweller



Robert Schweller received his Ph.D. in Computer Science from Northwestern University in June 2007 and his B.A. in Mathematics from Carleton College in June 2001. His general research area is the design and analysis of algorithms. More specific interests include the algorithmic self-assembly of DNA and applications to nanotechnology, combinatorial code word design, graph labeling, anomaly/intrusion detection over network data streams, and bioinformatics.

Dr. Christine Reilly



She received her Ph.D. in Computer Science from University of Wisconsin - Madison. Her research interest include transparently gathering provenance with Provenance Aware Condor, exploring provenance in a distributed execution system and estimation of low stream-flow statistics using baseflow correlation.

Her research interests also include the analysis of big data in social media specifically in Twitter.

Computer Science Faculty

Dr. Emmett Tomai



Emmett Tomai received his Ph.D. from Northwestern University in 2009. His field of research within computer science is artificial intelligence for natural language. He is particularly interested in computational models of generating and understanding narrative descriptions of dynamic environments, learning semantics with structured representations of pragmatic tasks and incomplete reasoning with heterogeneous, unreliable knowledge sources.

Dr. Andres Figueroa Lozano

Dr. Andres Figueroa obtained his Ph.D. in 2004 from the Computer Science Department. In 2004 he was appointed Assistant Professor of Computer Science at the University of Texas - Pan American; and Adjunct Assistant Professor of Epidemiology and Biostatistics Department at the University of Texas Health Science Center at San Antonio since August 2007. Current research interests include bioinformatics and computational molecular biology. He has published in well-known journals and peer-reviewed conference proceedings in the field. Works include developing efficient algorithms for microarray data analysis, phylogenetic analysis, and clustering and classification analysis. More recently, he has focused on statistical genetics, genetic epidemiologic studies, family and case control studies using haplotype blocks, and identification of multiple genetic markers influencing heritable traits.



Brain Computer Interfaces for Authentication and Object Movement



Authors: Eric Treviño & Michael Fuller

Advisor: Dr. Wendy Lawrence-Fowler

Our project is developing brain computer interfaces (BCI) using a neuro-headset to establish direct communication between the human brain and a computer. We are using the Emotiv EEG headset to collect human thought as brain waves. Using training algorithms, we detect patterns in the brainwaves and map the brainwaves onto commands in a computer application. We are focusing on two different applications where users explicitly manipulate their brain activity rather than use motor movements to accomplish tasks. The first is a biometric user authentication application. After training on a series of images, the signature brainwaves patterns are stored for the user. During a 2 pass authentication, the user is allowed access after they have entered a standard keyboard password and they are able to replicate their signature brainwave pattern for a series of images. The use of this biometric authentication in a two factor system strengthens the identification process. The second application involves interactions in a 3D immersive environment. After the user trains the application on commands, the user is then able to interact with and control a model. This can be used to create training data for use with other devices, such as a robotic arm.

Recent advances in BCI research have allowed this extension of the traditional human computer interactions model. However, the focus of these advances has been on improving the quality of life for individuals with physical disabilities. There are currently no publicly available BCI applications which target authentication or activity in an immersive environment. Our applications will increase the awareness and possibilities of BCI applications using EEG



Author: Roberto Cruz

Advisor: Dr. Xiang Lian

Sensor hardware are integrated in mobile devices that help automate or make our daily tasks much easier to carry out. The sensor hardware integrated in mobile devices are accelerometer, gyroscope, magnetometer and barometer. The accelerometer helps in detecting the orientation of the phone and gyroscope help in tracking rotation and twist and linear acceleration of movement. For this project we will focus on the accelerometer and gyroscope only. These sensors make it possible to create an interface screen that will lock an image or object in its current position, while continuing movement or rotation on the phone in any direction desired. By using the sensors we can acquire the x, y, z coordinates of the phone and image's origin in its current state. This values help carry out a calculus 3 based mathematical computation with vectors and angles in 2D and 3D space. These computations calculate the transformations the object is going through in order to keep the object or image from decreasing in size, as the phone is going through movement or rotation. In this poster, we demonstrate how these calculations can keep the image stay in its current position without changing in size.

Dr. Xiang Lian



He received his Ph.D. degree at Hong Kong University of Science and Technology in August, 2009. He is currently an assistant professor at the Department of Computer Science , University of Texas-Pan American.

Dr. Wendy Lawrence-Fowler

Dr. Lawrence-Fowler received her Ph.D. in Biological Anthropology from The Ohio State University in 1983 and a M.S. in Computer Science form New Mexico State University in 1988. Her areas of interest include Large and Open Information Systems (pervasive information space), Multimedia, and integration of appropriate technologies in the learning environment. IN particular, she is interested in issues of re-retrieval of information and more generally in visualization of information. Her research information for personal use and the use of the/a pervasive digital infrastructure on the enhancement of learning opportunities.



Computer Science Faculty

Dr. Laura Grabowski



Dr. Laura Grabowski joined the faculty in the Department of Computer Science at the University of Texas - Pan American in the fall of 2009. She received her Ph.D. in 2009 from Department of Computer Science and Engineering at Michigan State University in East Lansing, Michigan. She was a member of

the De-volab (Digital EVOLution LABoratory), working with Dr. Charles Ofria and Dr. Robert T. Pennock. She also worked on the Evolving Intelligence Project.

Dr. Bin Fu

Bin Fu is an associate professor at the computer science department of the University of Texas - Pan American. He received his Ph.D. in computer science from Yale University in 1998. From 1998 to 2002, he worked in the computer industry in the bay area of California. From 2003 to 2006, he was an assistant professor at the University of New Orleans. He joined the University of Texas - Pan American in 2006. IN 2009, he received the NSF early career award. His research interests are in bioinformatics algorithms, and computational complexity theory.



MIPS CPU Simulation Software



Author: Erik Gomez

Advisor: Dr. Yul Chu

Computer architecture is a very important discipline in computer engineering and computer science. It is important enough that it is currently included in the majority of computer science and computer engineering university programs. Computer architecture is however not a subject that can be easily digested by students. It is for this reason that computer architecture instructors have relied on a variety of interactive teaching methods such as the use of CPU simulation programs in order to give students a greater understanding of the material offered in computer architecture courses.

Many CPU simulation programs have been developed for most of the instruction set architectures that exist, be they RISC or CISC architectures. However, a major trend observed is that they follow a simplistic input-output approach. This means that the user provides an input program, the simulator processes it and executes it, and finally the user is provided with merely a "final picture" of the contents of the various components of the CPU such as memory and registers. This approach fails to let the user see what happens in between the input-feeding and output-receiving phases. On this talk, a software development project for a MIPS-Based CPU Simulation Software to address such failure is presented. The project's current progress, a simple prototype, and future work will also be discussed.

The goal of the MIPS-Based CPU Simulation Software is to provide the user with a graphic visualization of what goes on inside a MIPS-based CPU every time a MIPS assembly language instruction is inputted. The proposed simulator will not only graphically display the data path of each instruction via animations but also make changes to the various CPU components in real time and visually.

City of Doom: Adaptive AI for a Turn-Based



Author: Daniel Gamez

Advisor: Dr. Laura Grabowski

My project is a turn-based battle game where the player must traverse a map with a grid layout to reach an end goal. The player deals with obstacles to reach the goal such as enemies (monsters) that the player will enter turn-based combat with upon running into them. Often in this sort of game, enemies would appear in random encounters, fixed positions, or wander in scripted movements. This game will feature monster behavior that will adapt in response to the player's actions as the game is being played. The question I ask myself and wish to answer with this project is "Does changing monster behavior make this turn-based battle game more enjoyable?"

The battle system uses statistics (Level, Hit Points, Attack, etc.) that increase as the player succeeds in combat. Monster behavior is based on the probability of three reactions occurring: chase the player, run from the player, or move randomly. The probability of each constantly adapts during the game in response to the player's actions. The player's Level and the number of monsters defeated changes the probability of the three reactions, making them either more likely or less likely to happen.

This project applies a variation to a game that utilizes a turn-based battle system, providing adaptive enemy behavior. Using behavior based on probability makes enemies less predictable and therefore more challenging. I believe the final product with the monsters behaving as intended should be more enjoyable to players. Monsters that can run in fear or rush to attack will be found more entertaining and challenging than monsters with random/ scripted movements, or static positions.

Computer Science Faculty

Dr. Richard Fowler



Richard H. Fowler is a professor in the Department of Computer Science at the University of Texas - Pan American and Director of Graduate Programs in computer science. He received a Ph.D. in Psychology from the University of Houston in 1980 and a M.S. in Computer Science from New Mexico State University in 1989. Prior to joining the UTPA faculty in 1989, he was employed at the New Mexico State University Computing Research Laboratory and at IBM. His research interests center on information visualization with a focus on document retrieval, human computer interaction, and interactive systems generally. Other projects are concerned with personal information management, knowledge domain representation, and the uses of visualization across disciplines.

Mr. David Egle

David Egle received his M.S. in Mathematics from Texas A&M (College Station) in 1977, and is currently finishing his M.S. in Computer Science at UTPA. He has taught at UTPA since 1983. His research interests include Numerical Methods and Artificial Life.



Computer Science Faculty

Mr. Gustavo Dietrich



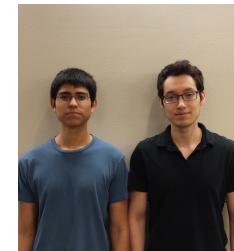
Gustavo got his B.S. in Electrical Engineering from the Universidad Nacional de Tucuman (Argentina) by the end of 1985 and came to the USA to obtain a Masters Degree from Texas A&M (A&I at that moment) at Kingsville in 1988. He returned to Argentina where he worked as an independent programmer and as an instructor at the Universidad Nacional de Tucuman. In August 1999 he became a lecturer for the Department of Computer Science

at UTPA. He is particularly interested in helping students learn the fundamental concepts of computer science. He serves as the Program Coordinator for the CS Mentoring Program and is also chair of the annual High School Programming Contest held at UTPA each spring semester.

Dr. Zhixiang Chen

Zhixiang received his Ph.D. in Computer Science from Boston University in January 1996. He taught at Southwest State University from Fall 1995 to September 1997. He also studied at the University of Illinois and worked and studied at Huazhong University of Science and Technology. His research interests include Intelligent Web Search, Computational Complexity Theory, Computational Learning Theory, Informational Retrieval, Data Mining and Web Mining, Algorithms, and Bioinformatics. He has taught a wide range of computer science courses. He is the Department Chair and the Associate Director for research at the Computing and Info Tech Center (CITeC) at UTPA

Toolset For the Nubot Model



Authors: Mario Maldonado & Dominic Fernandez

Advisor: Dr. Robert Schweller

The Nubot Model is a computational model of active self-assembly for studying the complexity of self-assembled structures. It can be thought of as a growing cellular automaton, where rules are applied nondeterministically and asynchronously. What distinguishes this model from others is the addition of a rule type that allows units to move relative to each other, applied locally but propagating the movement throughout the configuration, allowing for efficient growth of algorithmically assembled structures without external direction. To effectively analyze the complexity of these assemblies, we must be able to simulate a nubot environment, design and edit configurations, and produce large sets of rules, all with minimal difficulty.

We are developing a set of visual tools that will streamline the process of creating configurations, generating rulesets, and then simulating the system that incorporates them in a user-controlled virtual environment: Our tools will allow the user to “paint” the assembly units on a grid with states and bonds, automatically generate a list of primitive rules from a given input, and encode lengthy videos of a simulation.

Service Order Management System



Author: Christopher Gonzalez

Advisor: Dr. Emmett Tomai

There are many applications today that allow businesses to manage workflow and workload distributions. The problem is that these are mainly done manually with little to no optimization. This project will develop a system in which businesses that require going out to locations have a way to allocate work orders in an efficient manner given the metric of distance and time. This allocation should be able to be done on a one by one basis or on a massive scale and at the same time balance work load time for each available employee. The system should also be flexible enough to fit the needs of a variety of business types.

Computer Science Faculty

Dr. Pearl Brazier



Dr. Brazier got her Ph.D. in Computer Science at the University of Texas - El Paso in 2010. The focus of Dr. Brazier's research is on investigation of an ontology driven discovery approach that can support the elicitation, sharing, documentation, and registration of scientific computational entities and other resources distributed on the Web. Her innovative work employs new Web 2.0 and Semantic Web technologies, such as structured wiki and Resource Description Framework, and features applications in geosciences. This multi-disciplinary research resulted

in several significant contributions, including the design of Computational Entity Discovery Ontology, unique architecture for the GeoSciences Web Service Discovery (GEO-SEED) system, and novel approach to database schema generation in relational RDF repositories.

Dr. John Abraham

Dr. John P. Abraham has been teaching at UTPA since 1976. He designed many of the courses for the MSIT program. Dr. Abraham is currently focusing on Cyber Security and Forensics.



Computer Science Faculty

Get \$mart Android Application

Mr. Lucian Silcox



Lucian Silcox received his Bachelor's in Computer Science and English Literature from the University of Texas Pan American, before returning to complete a Master's in Computer Science. His research interests primarily revolve around natural language processing, specifically in gaining a deeper understanding of the passage of time in a narrative and the ability to construct timelines of events.

Computer Science Department Staff



Mr. David Kirtley
Software System Specialist III



Mrs. Lucy Martinez
Administrative Assistant II



Mrs. Debbie Egle
Finance Manager



Author: Carlos Magaña

Advisor: Dr. Xiang Lian

This project consists of the development of an Android application to help the users find gas stations along their travel route. The main purpose of this application is to help the user save time and money by finding the gas station with the lowest price along their travel routes. This application would be a great resource for low income families and anyone who would like to save both money and time. Gas \$mart uses the Google Android Maps V2 API to retrieve maps and directions. It also makes use of the myGasFeed API to obtain information on gas stations and their fuel prices. The application takes a destination input from the user and the preferences set by the user to formulate queries. It queries the mapping information using the Google Android Maps V2 API and renders the map based on the user's current location. The myGasFeed API is used to query information on gas stations located along the route based geographical points obtained from Google Maps. An algorithm will sort and select the best gas stations options to present them to the user. Once the user selects one of the options the application will update the route to direct the user to the selected gas station and it will then redirect the user back to the original travel route.