



# *Scholars Summit*

CAMERON UNIVERSITY

*A Celebration of Faculty and Student  
Research, Scholarship, and Creative Activities*

STUDENT & FACULTY

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SCHOLARSHIP EXHIBIT  
AND PRESENTATIONS

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*April 2015*



## *Cameron University Mission Statement*

Cameron University provides a diverse and dynamic student body access to quality educational opportunities; fosters a student-centered academic environment that combines innovative classroom teaching with experiential learning; prepares students for professional success, responsible citizenship, life-long learning, and meaningful contributions to a rapidly changing world; and is a driving force in the cultural life and economic development of the region.

## *Cameron University Core Values*

- Student learning
- Excellence in teaching, scholarship, service, and mentoring
- Leadership in our community and region
- Shared governance
- Diversity
- Responsible stewardship of public and private resources, the public trust, and Cameron's future.

# *Faculty and Student Scholarship Exhibit*

Dr. Ronna Vanderslice, Vice President for Academic Affairs

Dr. Tony Wohlers, Academic Enrichment Director

## *Student Scholars*

› **Funke Ajisafe**

› *Data Mining and its Application in Industries*

Many businesses today cannot operate without the use of one form of information technology or another and one of the technologies used is data mining. It gives useful information about something that is unknown or future event that is unforeseen. The aim of this paper is to draw attention of business owners to the usefulness of data mining in industries. I have reviewed the literature of data mining techniques through different journals, articles and books. This paper gives a clearer understanding of the basic techniques used, data mining models and also explains the benefits and drawbacks of data mining. The ultimate objective of data mining in businesses is to improve decision making. It helps businesses to predict potential outcomes, understand their customers better and to have a competitive advantage over others. It has a lot of benefits and it has helped organizations to collect, analyze and access data in new ways. For data mining to be effective and relevant in businesses, managers or business owners must have a better understanding of how it works and how to it can be applied to their day to day activities. This paper is designed to help individuals and businesses understand the fundamentals of data mining and how it can be applied. The limitation of this paper is that it only specifies the basics of data mining, how it can help improve businesses, as well as some of the challenges faced when dealing with data.

› **Akinola Akinlawon**  
*Roots of Polynomials and their Applications*

We introduce a special class of real recurrent polynomials of degree  $n$ , ( $n$  a natural number) with unique positive roots, which are decreasing as  $n$  increases. The first root as well as the last root are expressed in closed form and enclosed all in between roots. Some applications are also provided in this study.

› **Corrine Binnings**  
*Making Recycling More Accessible at Cameron University*

The research conducted examined the availability and convenience of recycling containers on the Cameron University campus and proposed ways of improving on the recycling program that already exists. A survey of faculty and students showed 58% of respondents were unable to locate a recycling bin on campus. The survey also showed that 96% expressed a willingness to use and support a more convenient recycling program. Proposal for improvement of the existing recycling program includes providing an additional bin in each classroom that would serve as a recycling bin for bottles used by students while in class. Another proposal is to create an annual poster competition that will involve all student organizations. Posters can be posted on the school campus as a way of keeping students and faculty informed and aware of recycling.

› **David Chatman**  
*Gamification of Algebra Concepts*

Creating a game that will serve as a tutoring system for students in college algebra.

› **Troy Hardin**  
*IT Capstone - Inventory Management System*

The information technology capstone course is taking on the task of building an inventory management and accountability database for Comanche County Memorial Hospital. This course focuses on service learning; applying the skills and concepts learned over the entire degree plan to a real world problem. The students met with the clients to understand their needs, and conduct a thorough analysis of the proposed project. After analyzing the project, work began in earnest to build a database solution to fulfill the needs of the client. Multimedia design students are producing the user interface, information technology students built the database, and computer science students wrote computer code that allowed the two to communicate with each other. As the project nears completion, another group of information technology students will thoroughly test the system to ensure there are no security problems. With so many students involved, communication is a key component to the success of the project. The service learning environment tests not only the individual skills learned throughout the entire college curriculum, but the teamwork and communication skills necessary to ensure the success of an enterprise project.

› **Saranah Isenberg**  
*Thermal Parameters of Microhabitats of Lizards in the Wichita Mountains*

Previous work has shown that *Sceloporus consobrinus* (the prairie lizard) and *Crotaphytus collaris* (the Eastern collared lizard) prefer different microhabitats within the Wichita Mountains. This may be due to prairie lizards choosing microhabitats to avoid competition with or predation by collared lizards. Alternatively, prairie lizards may be accommodating different thermal preferences as they have lower preferred body temperatures than collared lizards. The body temperature of lizards is influenced by factors that include wind speed, conduction, solar radiation, air temperature, and organismal anatomy. Operative temperature is a thermal parameter that accounts for all of these factors. We tested the hypothesis that lizards are choosing microhabitats based on temperatures available rather than to avoid competition or predation. We used fourteen anatomically correct copper lizard models ranging in snout-vent length from 2.7-7.5cm as operative temperature thermometers.

We placed models in various locations suitable for prairie lizards within three sites in the Wichita Mountains Wildlife Refuge over the course of two summers (2013-2014). Additionally, we recorded air temperature, wind speed, and relative humidity throughout the day. We then overlaid this data with the preferred body temperatures of each lizard species to determine if lizards were choosing areas that best matched their thermal preferences.

### › **Rahul Jayant**

› *Virtualization and its Business Impacts*

This paper highlights an emerging technology that is currently being adapted by businesses all around the globe. With increasing pressure on business to reduce the operating expenses to increase the overall value of the business, new ways to reduce the overall organizational expenses are emerging at a fast pace. From an information technology standpoint, one of the most powerful cost reduction technologies is virtualization. This paper draws case studies of implementation of virtualization from various vendors of virtualization technology like Cisco, VMware and Tech target. These case studies are used to identify business specific problems faced by an organization prior to implementation of the technology and how the technology helped these organizations to overcome these problems. Additionally, the financial statistics provided by these papers are also used to ascertain the facts presented in the paper. The paper assumes virtualization to be limited to servers hosting instances of operating systems and does not go in depth about other virtualization capabilities like storage virtualization and desktop virtualization.

### › **Robert Johnson**

› *Comanche County Memorial Hospital Inventory System*

Students in IT capstone are required to build a program for Comanche County Memorial Hospital (CCMH). This course combines four disciplines pursuant to the completion of aforementioned project. Multimedia, computer information systems, security, and management information systems all combine to create a program for CCMH that will track the inventory and location of items that are checked out for in the hospital. There is no previous version of this program and any implementation will be built based on the clients (CCMH) request.

## **Bishaka Karki**

### *Web-based Database Inventory Project for CCMH*

The Cameron University Computing and Technology Department offers a course with title IT4444. This course is an interdisciplinary capstone course where students develop and complete a service learning project for a real-world client. In this course, students gain professional skills. We develop a web-based database inventory for the information technology department of a local hospital in Lawton.

## **Johnna Newby**

### *Recruitment Strategies Used By Hiring Professionals*

The Bureau of Labor Statistics projects more than 1.3 million college graduates will enter the workforce in 2015, giving rise to the question, “What strategies are used by hiring professionals when recruiting and assessing new talent?” In an effort to determine prevailing strategies, we polled 51 human resource (HR) managers to garner information. The mixed methodology survey asked managers (a) to rank desired applicant skills and recruitment methods and (b) to provide qualitative data including successful applicant traits, common mistakes on applications/resumes, interviewing pitfalls, and difficult interview questions. We hypothesized that most hiring managers would rate personal skills highest and would prefer online resources to recruit new talent. These assumptions were substantiated as 25 of 51 HR managers ranked personal skills as the most important quality applicants possess. Furthermore, our survey indicated that 40 of 51 HR managers most often used online resources to recruit new applicants, followed closely by networking with other professionals as their second choice. Surveyed managers indicated that applicants who showed honesty, productivity traits, and relational skills were of high demand. Issues regarding the job search process included false information, aesthetic issues, a lack of knowledge/information, and egotism. Behavioral, situational, personal inquiry, and skill/knowledge based questions were favored during interviews.

› **Kathryn Parsley**  
*Mississippian Aged Palynomorph Dispersal Patterns Using  
the Microspores of Winslowia tuscumbiana as a Proxy*

Because plants disarticulate into their individual organs (stems, leaves, roots and reproductive structures), one of the main goals of paleobotany is reconstructing whole plants from those loose organs. Recently, a Mississippian aged fossil lycopsid from northern Alabama has been reconstructed and named *Winslowia tuscumbiana*. This plant grew in a monospecific salt marsh community, and all of the organs were recovered and connected except for the microspores and microsporophylls. This has facilitated an undergraduate research project to recover those parts of the plant. In addition to completing the whole plant reconstruction, this project will also allow the formation of hypotheses about the dispersal of fossil pollen and spores. This project is analyzing ten microscope slides of recovered pollen and spores (paleopalynology) and will ultimately result in a peer-reviewed paper. The dominant microspore in the assemblage is trilete, rounded triangular, with laesurae that extend to the edge of the central body. A thick costa separates the central body from the cingulum. The margin of the cingulum is rough or undulating and sculpture of the central body is granulate. These spores conform to the spora dispersae species *Lycospora brevijuga*. However, dispersed spores from outside of the *Winslowia* community suggest that a diverse assemblage of plants existed in the extra-basinal uplands of the area at this time. These extra-basinal specimens include acingulate spores. For example, *Granulatisporites*, *Cyclogranisporites*, *Punctatisporites*, *Leiotriletes*, *Knoxisporites*, *Acanthotriletes* and *Raistrikiia*. Additional spore types are present and the majority conform to the genus *Spencerisporites*. Only one species of monosaccate pre-pollen has been identified and this (*Potanieisporites elegans*) dates the assemblage as at least 342 million years old. This project is producing valuable data to the discipline of paleontology by providing data on the dispersal of pollen and spores during the Mississippian Period, a time that is poorly documented in North America.

› **Hannah Richards**

› *Effects of Large-Scale Fire on Nesting of Scissor-tailed Flycatchers in the Wichita Mountains*

Scissor-tailed Flycatchers are conspicuous Nearctic-Neotropical migratory birds of the southern Great Plains. Often considered savannah specialists, they nest in a variety of open habitats. We searched for nesting Scissor-tailed Flycatchers at the Wichita Mountains Wildlife Refuge in Comanche County, Oklahoma from April through July during the years of 2008 - 2014. All nests had their location recorded with a handheld GPS, and were checked every 2-3 days to monitor their status. In 2011, fires burned a significant portion of both grasslands and oak woodlands on the refuge. We used ArcGIS to compare the abundance, distribution, and density of Scissor-tailed Flycatchers before and after these fires. While Scissor-tailed Flycatchers did not significantly increase their density, they did expand their distribution in years after wide-spread fires. Expansions are likely due to a decrease in tree density in woodlands and a decrease in grass/forb height in grasslands. Frequency of nest success also increased after fires, likely due to a decrease in predator cover and an abundance and/or an increase in profitable foraging areas.

› **Sarah Vrla, Brandon McDonald, Bryce Geiger, Joe Macedonia**

› *Potential UV-Vision in the Kangaroo Rat (*Dipodomys ordii*), Evidence from Photoreceptor Proteins (opsins) in the Retina*

The visual system of species has far reaching implication affecting our understanding of foraging strategies, mating systems, daily activity patterns, intraspecies & interspecies interactions, ect. As part of an integrated research project aimed at determining whether the kangaroo rat (*Dipodomys ordii*) can communicate in the ultraviolet (UV), we used Immunohistochemical labeling (IHC) to identify photoreceptor proteins (Opsins) expressed in the retina. We constructed retina maps illustrating the relative densities of rod cells expressing Rhodopsin (Rho1), and of cone cells expressing Medium-Long Wavelength (MW/LW), and Short Wavelength (SWS1) Opsins. The retina of *D. ordii* has a uniform distribution and high density of Rhodopsin, high density of MW/LW opsins, and high but variable densities of the SWS1 opsin across the retina. Our data led us to conclude that *D. ordii* has some degree of UV-vision.

The composition and densities of MW/LW & SWS1 expressing cone cells resemble that of a crepuscular / diurnal species thereby supporting previous authors who have suggested *Dipodomys* displays crepuscular and diurnal activity patterns. The uniform and high density of Rhodopsin also confirms that the species has visual acuity at night. Visual acuity in low light might be associated with known avoidance of activity during high moonlight intensity; we propose that the species could easily compensate for loss of foraging due to high moonlight nights by foraging during crepuscular or diurnal periods.

### › **Han Xiong and Douglas Schlumbohm** *Gamification of Discrete Math*

Gaming environments have been used to teach mathematical topics such as addition and division in a fun manner. This is called “gamification.” However, when it comes to college level mathematical concepts such as the use of the quadratic formula, there are very few pieces of software that explain these concepts in a fun, or gamified, way. We are currently developing a video game using the Unity 4 developing environment to teach the subject of sets from the study of discrete math in a fun way, thus gamifying the subject. We are taking 3d models, 2d sprites, and animations that our multimedia teammates have created and are breathing life into them using the c# programming language. We are using these c# scripts to move these models, perform calculations, and display the results of players’ interactions with the game. Through playing this game, that is powered by c# coding, players will actually have fun while learning the concepts of intersection and union of sets.

## *Faculty Scholars*

### › **Krystal Brue**

Brue, K. The Impact of Work-Life Balance on Entrepreneurial Sustainability.

Brue, K. Leadership matters: Designing and Implementing Women’s Leadership Development Programs.

## › William Carney

Carney, W. The Dance of Change in an English Department: A Service Learning Case Study.

Carney, W. Critical Service Learning.

Carney, W. Samantha Power: Before and After “Hell.”

## › Paritosh Das

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## › Usef Faghih

Faghihi, U. Creating a Gaming Environment for Teaching College Algebra.

Faghihi, U. Creating a Game to Teach Theory Sets Such as Union and Intersection.

Faghihi, U. Machine Learning Algorithm to Extract Words that are Semantically Related.

## › Susan Hall

Hall, S. 2015. The Uncanny Sacrifice: Sex Trafficking in Chris Abani’s *Becoming Abigail*. *Critique: Studies in Contemporary Fiction.* 56.1: 42-60.

## › Dwight Hite

Hite, D. M., Nandedkar, A., Mercer, J., & Martin, W. 2014. The Development of an Inspirational Leadership Workshop: An Academic-Practitioner Collaboration. *Journal of Leadership Education*, 11(2): 98-106.

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## › Michael Husak

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## › Hardy Jones

Jones, H. Dry Gumbo.

Jones, H. Grandmother's Coconut Tree.

Jones, H. People of Good God.

## › Yingqin Liu

Liu, Y. 2015. Building a Bridge Between Authentic Learning and Service Learning: A Case Study from a Technical Writing Class. *Journal of Sino-US English Teaching*, Vol. 12. 2.

## › **Brandon McDonald**

Belew, C. and McDonald, B. 2014. UV-Reflective Morphology in the Rodent Families Heteromyidae, Geomyidae, and Dipodidae: Results from UV-Photography. 94th Annual Meeting of the American Society of Mammalogists, Oklahoma City, Oklahoma.

Vrla, S., McDonald, B., Geiger, B., Macedonia, J. and Ellis, K. 2014. Potential UV-vision in the Kangaroo Rat (*Dipodomys ordii*), Evidence from Photoreceptor Proteins (Opsins) in the Retina. 94th Annual Meeting of the American Society of Mammalogists, Oklahoma City, Oklahoma.

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## › **Elisabeth Ponca-Garcia**

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## › **Adam Randell**

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## › Jeff Seger

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## › Tony Wohlers

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# Research and Scholarly Activities of Students and Faculty of Cameron University

This publication includes selected research and scholarly activities of students and faculty of Cameron University. The dual goals of professional development at Cameron University are continued learning of students and faculty and contribution in their respective disciplines.

Office of Academic Enrichment  
Director | Dr. Tony Wohlers



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