The Symposium on Computing at Minority Institutions
April 12 – 14, 2012, Howard University, Washington, DC

Personalized Computing: From the Apps to the Clouds

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Symposium Schedule at a Glance Thursday, April 12, 2012 – Churchill Hotel	
6:00-8:00	Registration and Reception
Friday, April 13, 2012 - Howard University	
7:30	Buses Leave Churchill Hotel
8:00-8:45	Breakfast at Howard (*Gallery Lounge*)
9:00-9:45	**Welcome**: (*Forum*) Dr. Thorna Humphries, ADMI President, Norfolk State University Dr. John Trimble, Symposium Chair, Howard University
9:45-11:15	**Faculty Workshop - Android Apps** (*Rm 148-150*) Dr. Legand Burge, III , Howard University
	Student Workshop - Graduate Education (*Forum*) Dr. Cheryl Seals, Auburn University and Ms. Darryl Monteau, CReSIS
11:30-1:00	**Student Workshop - Android Apps** (*Forum*) Dr. Legand Burge, III, Howard University
	Faculty Paper Presentations (Rm 148-150) – Dr. Andrea Lawrence
1:00-2:00	**Luncheon** (*Gallery Lounge*) – Welcome: Dr. William Robinson Speaker: Microsoft – Ed Donahue
2:00-4:15	**AWARDS: CReSIS Scholars-- Dr. Linda Hayden**
	Graduate Student Papers (*Forum*) – Dr. Thorna Humphries
2:00-3:00	**Faculty Workshop - NSF Panel** (*Rm 148-150*) – Dr. Loretta Moore Dr. Claudia Rankins – NSF Dr. William Robinson - Vanderbilt University/NSF Trust Sylvia Spengler - NSF Trust
3:00-4:15	**Cyber Panel** (*Rm 148-150*) – Prof. Robert Willis Prof. Robert A. Willis Jr., Hampton University, Willis Research LLC Dr. Gerry Vernon Dozier, North Carolina A&T Brian Gouker, NSA Dr. Jonathan Graham, Norfolk State University Dr. Rajni Goel, Howard University
4:45-5:15	International Opportunities and Travel (Both; *Rm 148-150*) - Dr. John Trimble
5:30	Pizza Party with Grad Schools Display (*Rm 148-150*)
7:30	Buses Leave Churchill Hotel
Saturday, April 14, 2012 - Howard University (Mackey and Downing Auditoriums)	
8:00-8:45	Breakfast at Howard University (*Downing Auditorium*)
9:00-10:45	**Undergraduate Student Papers** (*Downing Auditorium*)
11:00-12:00	**REU Student Presentations** (*Downing Auditorium*) Moderator: Ms. Darryl Monteau and and Mr. Je'aime Powell Kirsten Hawk, John Bell, Dalesha Cartman
	Faculty Workshop - Intellectual Property (*Mackey Auditorium*)
12:00 - 1:00	**Luncheon Speaker** (*Downing Auditorium*) – Dr. William Lupton
1:00 - 2:30	**Faculty Workshop** (*Mackey Auditorium*) - Ramon Harris - Alika Muhammad
2:00-4:00	**Student Posters** (*Downing Auditorium*) – Dr. Elva Jones
4:00-6:00	National Mall Visit
7:00	**Banquet & Awards Ceremony at Churchill Hotel**

ADMI – Personalized Computing: From the Apps to the Clouds

The Symposium on Computing at Minority Institutions

April 12-14, 2012   Washington, DC

It gives me great please to welcome you to the Seventeenth Annual Symposium of the Association of Computer Information Science and Engineering Departments at Minority Institutions (ADMI 2011). This year's meeting is entitled "Personalized Computing: From the Apps to the Clouds".

As in the past, the goal of this symposium is the advancement of education and research for underrepresented minority students. Students showcase their research through oral presentations and a poster session. The symposium also provides a forum to disseminate and discuss initiatives that are designed to increase the numbers of minority computer scientists and computer engineers. Additionally, students are exposed to sessions geared to encouraging them to pursue graduate education.

The symposium's focus this year is personalized computing from the development of applications to its use of the cloud as a service platform. Thus, there are tutorial sessions on the development of applications for mobile devices and a faculty session related to the use of the clouds at the university level.

I encourage you to network with faculty members and students from the various colleges and universities in attendance as well as the representatives from government agencies and companies. There is a pizza party and a special recruitment session on Friday of the symposium for the purpose of networking and making new contacts with graduate school recruiters and other organizations, e.g. TRUST Science and Technology Center at Vanderbilt University and CRA.

The ADMI Board of Directors would like to thank the Computer Science Department at Howard University for all the support extended to Dr. John Trimble in sponsoring this year's symposium. We would also like to thank Dr. John Trimble and Prof. Gail Finley, who are serving as the local hosts. Additionally, the board would like to thank the program committee, chaired by Dr. Andrea Lawrence and Dr. Jean Muhammad, for their work to produce the program that we will be enjoying over the next few days. Finally, we would like to thank Ms. Gail Finley and Dr. Al Watkins for their work behind the scenes on registration and managing the ADMI website, respectively.

On behalf of the ADMI Board of Directors, I would like to say,

"Welcome to ADMI 2012".

Dr. Thorna Humphries
ADMI President

Panel / Speaker Bio

Legand Burge, III

Dr. Burge's research interests lie in the field of distributed computing. The primary thrust of his current research is in global resource management in large-scale distributed systems. In particular, he is interested in middleware technology to support scalable infrastructures for pervasive environments capable of servicing a very large number of small (possibly mobile) distributed and embedded devices efficiently. He is also interested in the application of distributed high performance computing to solve computational science problems in Biology, Physics, and Chemistry. Dr. Burge is currently the director of the Distributed Systems Research Group (DSRG) and associate director of the Center for Applied High Performance Computing at Howard University. Dr. Burge is also interested in Computer Science Education and Diversity, and Technology Transfer. Prior to coming to Howard University Dr. Burge worked for the National Security Agency as a Computer Analyst for 5 years, and as a computer consultant for several years. Dr. Burge's previous research includes consistency management in distributed databases, and message passing libraries for distributed parallel computing. The work on consistency management is aimed at developing lightweight protocols that communicate using epidemic algorithms. The distributed parallel computing work consisted of the design and development of an actor-based message passing and thread migration package for Java. The package was used to design a campus wide non-dedicated meta-computer that distributed, and performed load balancing of computations based on CPU cycle stealing.

Ed Donahue

Ed works for Microsoft as an Academic Developer Evangelist in the East Region (MD, DC, VA, WV, NC, SC). She's interested in the recruitment and retention of women in technology. As an ADE, she works with students and faculty in higher education and gives technical presentations about programming games for the Xbox, creating Windows Phone 7 applications, and pretty soon creating Windows 8 applications! She talks about the Imagine Cup, appLabs, and Game Camps.

Gerry Dozier

Dr. Gerry Dozier is Professor & Chair of the Computer Science Department at North Carolina A&T State University. Gerry is the director of the Office of the Director of National Intelligence Science & Technology Center of Academic Excellence in Advanced Biometrics at North Carolina A&T (Center for Academic Studies in Identity Sciences), the director of BEACON@A&T, as well as the PI for the Center for Cyber Defense. He has published over 120 conference and journal publications and has served as an Associate Editor of the IEEE Transactions on Evolutionary Computation and the International Journal of Automation & Soft Computing. Gerry is a member of the Editorial Board for the International Journal of Intelligent Computing & Cybernetics. His research interests include: Artificial & Computational Intelligence, Genetic, Evolutionary, and Neural Computing, Biometrics, Distributed Constraint Reasoning, Artificial Immune Systems, Machine Learning and Network Intrusion Detection. Gerry earned his Ph.D. from North Carolina State University.

Brian Gouker

Mr. Brian Gouker is the National Security Agency Visiting Professor at the U.S. Army War College in Carlisle, Pennsylvania. He is a classroom instructor and advisor to the school's faculty and staff on Intelligence and Cyber issues. Mr. Gouker is the former Deputy Director of the National Security Incident Response Center (NSIRC), and has served in various managerial, technical and advisory positions within NSA's Information Assurance and Signals Intelligence Directorates as well as in the agency's Legislative Affairs Office. Mr. Gouker has completed external assignments with the Defense Information Systems Agency (DISA), the FBI Computer Analysis Response Team, and VeriSign, Inc. Additionally, he has been extensively involved in NSA recruiting efforts, having served as the Senior Hiring Advocate for the NSA Defensive Information Operations Group. Brian is currently the NSA Senior Executive Academic Liaison to North Carolina A & T University, an NSA/DHS designated Center of Academic Excellence (CAE). He previously directed NSA's CAE program, and has continued his influence in this initiative as a CAE candidate school judge and a DoD Capacity Planning Grant evaluator. Brian is a retired Air Force Officer having served in England, Colorado, Virginia, Texas, and Maryland. Mr. Gouker holds a Bachelor's Degree in Computer Science from The University of Texas at Austin; a Masters Degree in Human Resources Management from Houston Baptist University; and a Masters Degree in Strategic Studies from the U.S. Army War College. He is a graduate of the National Defense University (NDU) Advanced Management Program and NSA's Senior Leadership Development Program. Brian holds the corporate Certified Information Systems Security Professional (CISSP) and government Intelligence Community Officer (ICO) and Joint Duty Assignment (JDA) designations. Brian holds a 3rd Degree Red Belt in Ryu Kyu Karate and is fluent in American Sign Language. Brian, his wife Sandra, and their family live in Hanover, PA.

Rajni S. Goel

Dr. Rajni S. Goel joined the Department of Information Systems & Decision Sciences in 2003. Her primary research areas of interest include: Information Security, Privacy, Railway Security, Data Mining, RFID, Supply Chain Security and Emerging Technology Security such as SOX and Digital Forensics. She has taught Information Security, Secure Electronic Commerce, Information Assurance: Security Strategies, Polices, Laws and Ethics, Management Information Systems, Introduction to Java Programming, Introduction to Computers, and Principles of Information Systems (Graduate). Goel holds a Ph.D. in Information Technology (Information Security area) and a MS in Mathematics from George Mason University, Fairfax, VA, and a BA in Mathematics from Millersville University, Millersville, PA.

Jonathan Graham

Dr. Jonathan Graham, is an associate professor of computer science and the director of the Norfolk State University (NSU) Information Assurance Research, Education and Development Institute (IA-REDI). He has been involved in Information Assurance research since 2001, starting with his Ph.D. dissertation. His research interests lie in the area of Digital Forensics, Intrusion Detection and Cyber Security games. He has supervised Information Assurance students at both the undergraduate and graduate levels. He is currently the PI or Co-PI on cybersecurity grants from the Department of Energy (DOE), the National Security Agency and the National Science Foundation (NSF). He teaches Computer Security I, Computer Security II and Management of Information Security. In 2009 he led the effort to have NSU designated as a NSA/Department of Homeland Security Center of Academic Excellence (CAE) in Information Assurance (IA) and continues to lead the efforts of the IA-REDI institute in curriculum development, research and collaboration.

Ramon Harris

As director of the Technology Transfer Project, Information Technology Senior Management Forum (ITSMF), Mr. Harris manages all aspects of a multi million dollar initiative by the Information Technology Senior Management Forum to assist Historically Black Colleges and Universities with building technology infrastructure and integrating information and telecommunication technology into the administrative and teaching and learning processes.

Mr. Harris was divisional president for Education Alternatives, Inc. during 1995 and 1996. As divisional president, he managed all aspects of 12 Baltimore City public schools involved in a unique private-public partnership arrangement. Mr. Harris spent 23 years with Xerox Corporation, managing finance and administrative operations. From 1988 to 1995, he served as the Business Manager for Xerox operations in Philadelphia, Pennsylvania and McLean, Virginia. He had financial responsibility for marketing, service and administrative functions with revenues of $400 million and profit of $150 million. Mr. Harris has extensive Total Quality Management experience. During 1986 and 1987, he was Region Quality Manager for Xerox"s Mid-Atlantic Region, where he developed and implemented Leadership Through Quality initiatives, which included all aspects of strategic planning and training. From 1980 to 1985, Mr. Harris was the Region Controller for Xerox's Mid-Atlantic Region with responsibilities for managing all administrative and financial activities. From 1978 to 1980, he was the Manager of Finance and Administrative Management Training. In this position, he developed performance-based curriculum for financial and administrative management.
Mr. Harris received his undergraduate degree in business from Penn State University, and he holds an MBA from the University of Pittsburgh.

William Lupton

Dr. William Lupton, Chairperson and Associate Professor Department of Computer Science. Dr. Lupton attended the Naval Postgraduate School in California where he received his B.S. and M.S. degrees in computer science. In 1980, Lupton served as chairperson of the Computer Science department at the United States Naval Academy. In 1981, Lupton took a position as a Professor of Naval Science at Louisiana State University and while there earned his Ph.D. degree in expert database systems. Following his tenure at LSU in 1987, Lupton joined the faculty at Jackson State University and chaired the Computer Science department from 1987 to 1991. In 1991, Morgan State University invited Lupton to chair the Computer Science department, where he presently serves. Since 2007, Lupton has been the principal investigator of Morgan State University's Network Resources and Training Site in the Minority University-Space Interdisciplinary Network project which aims to inspire young minority scientists and engineers. Lupton has been president of the Baltimore and National chapters of the National Technical Association and is a member of the National Academy of Sciences. He was also the inaugural national president of the Association of the Departments of Computer Science and Engineering at Minority Institutions (ADMI). He has generated over five million dollars in funding to improve science and science education.

Alika Muhammad

Alika Muhammad, Sr. Director of Cloud Solutions Program Management. Ms. Muhammad has 17 years in Telecommunication with 15 years at Alcatel-Lucent Inc. She graduated from Southern University in Baton Rouge, LA with a BS in Computer Science and a Masters in Business Management, with a Concentration Project Management, from Stevens Institute of Technology. Ms. Muhammad has also obtained her PMP, Project Management Professional Certification.   She has worked in development, marketing, portfolio management, product line planning, deployment, and program management across several businesses such as optical, wireless, mobile apps, Pre-Sales, open API, and cloud. Experiences within Alcatel-Lucent has taken her around the world managing various global teams. Directing a global team and as part of the Pre-Sales team has taken her to places such as Israel, Australia, Japan, Paris, Korea, Singapore, Africa, Brazil, just to name a few.

Claudia Rankins

Dr. Claudia Rankins is a Program Officer in the Directorate for Education and Human Resources at the National Science Foundation. She manages the Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) which provides awards to enhance the quality of undergraduate science, technology, engineering and mathematics (STEM) education and research at HBCUs as a means to broaden participation in the nation's STEM workforce. She also manages the Centers of Research Excellence in Science and Technology (CREST) program which makes resources available to enhance the research capabilities of minority-serving institutions through the establishment of centers that effectively integrate education and research.

Prior to this post, Dr. Rankins served at Hampton University for 22 years in a number of capacities, including endowed university professor, chair of the department of physics, assistant dean for research, and dean of the School of Science. She also directed STEM enrichment and research programs for students ranging from middle school through post baccalaureate studies. Her formal education includes military training, certification as translator and interpreter for German, French and English, a B.S. in Mathematics from Christopher Newport University, an M.S. in Statistics from Old Dominion University, an M.S. in Physics, and a Ph.D. in Physics both from Hampton University.

Since 1998, Dr. Rankins secured over $10 million in external grants that supported pre-college activities as well as undergraduate education and research in STEM. Her research in theoretical particle physics focused on the development of a model to describe distribution amplitudes and form factors of pseudoscalar mesons. Her current research interests focus on the underrepresentation of women faculty of color in STEM disciplines in the academy.

William H. Robinson

Dr. William H. Robinson received his B.S. in electrical engineering from the Florida Agricultural and Mechanical University in 1996 and his M.S. in electrical engineering from the Georgia Institute of Technology (Georgia Tech) in 1998. He received his Ph.D. in electrical and computer engineering from Georgia Tech in 2003. His dissertation was directed by Dr. D. Scott Wills who leads the Portable Image Computation Architectures (PICA) research group.
Since August 2003, Dr. Robinson has served as an Assistant Professor in the Department of Electrical Engineering and Computer Science at Vanderbilt University. He is a member of the Radiation Effects and Reliability (RER) research group. His research explores the system-level integration of computer architecture to understand the impact of technology on architecture design. He has several publications to his credit in both computer architecture and microelectronics venues. Topics of interest include computer architecture design, VLSI design, and field-programmable gate arrays (FPGAs).

Cheryl D. Seals

Dr. Cheryl Seals is an Associate Professor in the Computer Science and Software Engineering Department at Auburn University. Dr. Cheryl Seals is an assistant professor in Auburn University's Department of Computer Science and Software Engineering. She received her B.S. from Grambling State University, M.S. from North Carolina A&T State University and Ph.D. from Virginia Tech with all of her degrees in the area of Computer Science. Dr. Seals studies the area of novice programmers utilizing visual programming techniques, user interface design projects to improve interaction design, and game design & development and the dimensions games can add to computer literacy. She has a vested interested in programs that are community centered, increase diversity in technology, and targeted at helping today's youth strive for a better tomorrow. Seals continuously works with programs that provide computer interventions for students in the elementary, middle and high schools in the local area.

John Trimble
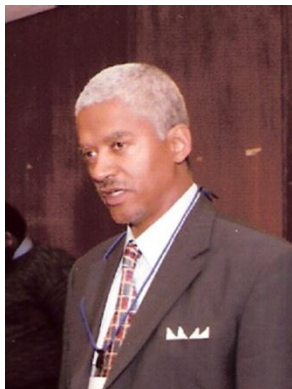
Dr. John Trimble Associate Professor at Department of Computer Science at Howard University. Dr. Trimble attended Georgia Institute of Technology where he received his Ph.D. in 1992. Some of his research areas are system dynamics philosophy, teaching tools, knowledge acquisition, knowledge acquisition, instructional expert systems, software quality assurance, life cycle models, discrete and continuous simulation models, Stella, Extend, Arena, knowledge management socially relevant computing: e-governance; persuasion, visualization and HCI, appropriate technology: research, practice and policy. Dr. Trimble has sponsored several international workshops in Africa for students and faculty.

Claude Turner

Dr. Claude Turner is an Associate Professor of Computer Science at Bowie State University (BSU) in Maryland, where he teaches courses in a variety of areas, including computer security, Internet programming and robotics. He received his B.E. in Electrical Engineering and a Master of Science in Electrical Engineering (M.S.E.E.) from the City College of The City University of New York. He earned his Ph.D. in Electrical Engineering from the Graduate Center of the City University of New York in 2003 for work in network bandwidth management. He has taught at Pace University, Fordham University and at Medgar Evers College. Dr. Turner's primary area of research is computer and network security. His other research interests include computer networking, time series analysis, intelligent systems, financial engineering and signal processing. Dr. Turner has been PI and co-PI on several funded projects, generally dealt with capacity building and research in Information Assurance, including the integration of security into computing courses. Dr. Turner is also the director of the Center for Cyber Security and Emerging Technologies (CCS&ET).

Robert A. Willis Jr.

Mr. Robert A. Willis is a retired Lecturer from the Department of Computer Science at Hampton University. He was with the University for twenty-five years. Six of which he served as Chair of the Department of Computer Science. Mr. Willis earned his Bachelor's (B.S.) degree in Electronic Engineering Technology from Chapman College and Masters (M.S.) degrees in Computer Science from The College of William and Mary.

Mr. Willis has diverse research interests and has authored/co-authored several articles in his areas of research. His research interests include Software Engineering, Information Assurance, Programming Languages and Concurrency. He has taught and developed several courses in these areas. He has also mentored an impressive number of student research projects and presentations.

Mr. Willis recent service achievements are as follows: President of the Association of Departments of Computer, Information Science/Engineering at Minority Institutions (ADMI) 8/2007, Vice President (Virginia Academy of the Sciences) 2007, President (Virginia Academy of the Sciences) 2001. Vice-President of Programs. Association of Departments of Computer, Information Science/Engineering at Minority Institutions (ADMI) 7/00 – 2007, Board Member At Large. Association of Departments of Computer, Information Science/Engineering at Minority Institutions (ADMI) 6/97 – 7/00, Treasurer (Virginia Academy of the Sciences) 6/97 - 6/98, Editor and Council of the Computer Science Section (VAS) 6/93 – Present, Chairperson of the Computer Science Section (Virginia Academy of the Sciences) 6/91 - 6/93.

Mr. Willis is a member of Upsilon Pi Epsilon, a recipient of Hampton University's Lindback Distinguish Teacher's Award (1990), selected for Who's Who Among America's Teachers (1996, 1998, 2000, 2002, 2004), Elected Fellow of the Virginia Academy of Science (2006) and recipient of Hampton University's Provost Innovative Teaching Award (2009).

Student Posters - Undergraduate

NO	Author	Title	Institution
1	Ademuwagun, Oluwaseun	Predicting Marked Code-switching in African Languages	Howard
2	Agli, Lino	Puzzle Play – An Android Application	UDC
3	Allen, Larry	PR2 Head and Head Manipulation Through Tele-operation Using an Attitude Heading and Reference System	UDC
4	Allen, Samantha and Burns, Hasani	Blackout: A Robot for Household Emergencies	Hampton
5	Barmore, Nyema	Development of a Web Application to Generate Walking Directions Between Locations on the Campus of Elizabeth City State University	ECSU
6	Barnes, LaEsha	WRF Verification Visualization Application	MVSU
7	Bell, John	Earth on the Go: A Mobile Website for Data Visualization	MVSU
9	Bevins, Joyce	Analyzing MapReduce Frameworks Hadoop and Twister	ECSU
10	Boles, Ryan	Next Generation Air Transportation System: Error Awareness, Training, & Performance	Morehouse
11	Burns, Hasani	The SnackBot: Vision and Perception with Audio and Video Captures Using gStreamer	Hampton
12	Cartman, Dalesha	The Use of Math Sprint in a Tutorial Program For Sixth Grade Students to Improve End of Grade Test Scores	MVSU
13	Coleman, Jenaelle	HTML-Based Log File Generation via C++ Class Developing	MVSU
14	Dykes, Nartezya	Charles Creek Flood Zone Modeling: A Correlation Study of Environmental Conditions Versus Water Level in the Pasquotank Watershed	Spelman
15	Farhat, Tarana	A Trummer's Problem Solver Using MPI	Hampton
16	Gonzalez, Luis	Biology Study Aid: Fetal Pig Dissection App for iPhone	UDC
17	Gregory, Jennifer	Wii Nunchuk Controlled Dance Pleo! Dance! to Assist Children with Cerebral Palsy by Play Therapy	Hampton
18	Hall, Cedric	A Study to Understand the Potential Vulnerabilities to the Foundations of Historic Structures in Coastal Areas	NSU
19	Haynes, Adrienne	Information Flow Model of a Single Neuron	NSU
20	Heath, Brandon	Building a Small Low Cost Effective Robot Swarm	WSSU
21	Hill, Troy	Servo Services	WSSU
22	Jayatilleke, Lalindra	Landmark Based Localization	UDC

NO	Author	Title	Institution
23	Jeffreys, Arsenio	Weight and Its Impact on Locomotion Robots	WSSU
24	Jones, Ashley	Using Bioinformatis for Gene Mapping and the Analysis of MicroRNA	Spelman
25	Lumpkin, Shaun	Using Sensors to Improve Assistive Robotics	WSSU
26	Montano, Freddy	Secret Text and Selective Twitter—Android Application Projects	UDC
27	Myles, Cornelius	Identifying Uniqueness in High Dimensional Social Science Datasets	JSUMS
28	Nelson, Darian	A Survey of Technology Applications for Promotion of Nutrition and Physical Activity	PVAMU
29	Olumese, Ehijele	Mitigation of Web Application Side Channel Leaks	Hampton
30	Peele, Christopher	Teaching Middle School Mathematics through Educational Games	Hampton
31	Smith, Emanuel	The Lost Java Code Teaching Module Abstract	MVSU
32	Thompson, Kendra	Analysis of Survey Results by Geographic Sector and Zip Code	MVSU
33	Walker, Nicholas	Building a Robot for Surveillance	Hampton
34	Wells, Marcus	Medicine Robot	Hampton

Student Posters - Graduate

No	Author	Title	Institution
1	Branch, Ric'Sheika	Designing and Implementing a Self-Assist Robot	WSSU
2	Duncan, Soniael	On Developing an App to Assist 1st Responders in the Digital Forensic Evidence Collection Process	JSUMS
3	Geter, Jamika	Designing Interactive Learning Lesson Games to Teach Youth about Computer Forensics	NSU
4	Williams, Crystal	Practical Investigations in Image Digital Forensics	FAMU

Faculty Paper/Presentation Abstract

A Teaching Module for Role-Based Access Control in Health Information Systems

Nathaniel Evans, Xiaohong Yuan, Jinsheng Xu
Computer Science Department
North Carolina A & T State University, Greensboro, NC   336-334-7245
{nlevans, xhyuan, jxu}@ncat.edu

Health Information systems is a promising field that is both relevant and currently in demand for computer science professionals. In recent years the U.S. government has placed emphasis on enhancing Health Information Systems. Therefore it is important for computer science students to learn about health information systems and the security and privacy issues related to health-information systems. One important aspect of security and privacy in health information system is access control. Role-Based Access Control (RBAC) has been used most commonly within various health information systems. This paper presents a teaching module for RBAC in health information systems. It describes the NIST RBAC model, extensions of RBAC based on context constraints, and expose students to current open source health information systems such as iTrust and OpenMRS. This module also includes a set of scenarios designed to illustrate the RBAC model. This module can be used in undergraduate courses on computer security, or in a health information system course.

Mobile Computing Environments for Learning

April Tanner, Ph.D	Jacqueline Jackson, Ph.D	Loretta Moore, Ph.D.
Jackson State University	Jackson State University	Jackson State University
Department of Computer Science	Department of Computer Science	College of Science, Eng. & Tech.
Jackson, MS 39217	Jackson, MS 39217	Jackson, MS 39217
601-979-3302	601-979-3320	601-979-0552
april.l.tanner.jsums.edu	jacqueline.m.jackson@jsums.edu	loretta.a.moore@jsums.edu

ABSTRACT

The Department of Computer Science at Jackson State University has embarked on a mission to revitalize interest in computing. One of the methodologies currently being utilized is the introduction of Computational Thinking. Through a newly designed course, CSC 116 Computational Thinking, Jackson State University students are being exposed to a variety of computing fields including mobile application development. Through the use of Google App Inventor, students are shown how to develop mobile apps that can be used to provide services to the disabled and children.

Engaging Students in Research: Benefits, Lessons Learned and Recommendations

Jacqueline Jackson, Ph.D.	Loretta Moore, Ph.D.
Jackson State University	Jackson State University
Department of Computer Science	College of Science, Engineering and Technology
Jackson, MS 39217	Jackson, MS 39217
601-979-3320	601-979-0552
jacqueline.m.jackson@jsums.edu	loretta.a.moore@jsums.edu

Computer Science is one of the fastest growing occupations. The demand for well educated professionals will continue to increase. Although the demand for such professionals is on the rise, current enrollment in the discipline, without effort, will not meet the demand. One of the efforts underway at the Department of Computer Science at Jackson State University to combat the problem of declining enrollment is engaging students in research.   Providing students with research experiences provides additional insight into the field and what it really has to offer.   This paper provides the reader with an inside look at the research experiences that students have been involved in; discusses the benefits of involving students in research experiences; shares lessons learned and provides recommendations to those who are interested in engaging students in research.

Web-based tool for Course management

Harry Keeling, Ph.D.
Computer Science Department, Howard University
hkeeling@howard.edu

In this presentation we introduce a web-based system designed to ease both the rigors of course management and the daunting task of collecting self-assessment data for program accreditation. In addition to the traditional job of assessing student performance in courses, teachers are being asked more and more these days to provide self-assessment data for a number of purposes. The task of evaluating teacher performance is comprised of measuring the effectiveness of classroom activities, labs and at-home exercises. It is well understood the task of self-study, as it relates to program accreditation, has placed an extremely heavy burden on all educators.   Unfortunately, to fulfill the self-assessment requirements of program accreditation, faculty are forced be selective about which metrics they choose to include in their course outcome assessments. This selectivity is driven by a lack of time and diminishing human resources. These limitations clearly can lead to biased and even inaccurate results. The student-developed system that we have been developing and employing for several years makes the tracking of course educational outcomes almost seamless with the measuring of student performance. Our system, called "AssessTrack", facilitates both formative and summative assessment of both students and teachers, while tracking course educational outcomes and program objectives. No longer do educators have to be selective about the metrics they collect. With AssessTrack, the effectiveness of our teaching is being measured. The result has been more comprehensive and accurate self-study reports to support accreditation.

Undergraduate Student Paper Abstract

Using the Qpid Messaging System to Deliver Weather Data to Clients for Visualization

David Etim
Junior, Computer Science,
North Carolina A&T State University
P.O. Box 3550   1601 East Market Street
(919) 824-1677   dnetim@ncat.edu

During the summer of 2011, scientists, researchers, and interns collaborated on a project at NOAA's David Skaggs Research Center involving data delivery paradigm followed by the new AWIPS II (Advanced Weather Interactive Processing System). The main objective was to set up a web client that writes a message and sends it using QPID and to set up a listener to read the message from the QPID queue. QPID is the Apache messaging system enabling entities to communicate with each other via queues ("topics").   In the current implementation of the data delivery paradigm, the web clients are developed independently of AWIPS II. However, they are used by CAVE (Common AWIPS Visualization Environment) plug-ins to access remote data servers. There are three web clients: Reg/Rep, which is a registry repository, WCSRI for we coverage reference implementation and WFSRI for web feature implementation. In the AWIPS II System, CAVE is used as a graphic user interface and EDEX (Environmental Data Exchange) for the decoding of observation and data sets.

Graphical User Interface for a Tool for Supporting Creative Writing

Michael Geda
Summer Undergraduate Research Experience (SURE) Program
Department of Computer Science, WSSU
Advisor: Dr. Darina Dicheva

This research focuses on TM4Book. TM4Book is a Topic Map-based semantic annotation tool which is currently under development in the Intelligent Information System group at the Computer Science department, WSSU. It is intended to support writers and readers engaged in planning, structuring, and analyzing text, especially narrative prose. Writers and readers should be able to create a topic map representing the most essential concepts in the story and the relationships between them. The Graphical User Interface (GUI) of such a tool has to be very easy to use and intuitive, which brings challenges to its implementation. My summer research work targets these challenges and is focused on the design and implementation of the TM4Book GUI using Java Swing.

Temporal Reduction of the Ice Shelf in Pine Island Bay Antarctica: 1972 - 2003

Ya' Shonti Bridgers (ECSU), Jessica Brownlow (MVSU), Kirsten Hawk (Spelman)
Mentor: Dr. Malcolm LeCompte, Assistant Mentor: Mr. Kaiem Frink
Principal Investigator: Dr. Linda b. Hayden
1704 Weeksville Rd, Box 672
Elizabeth City, North Carolina 27909

In an effort to determine whether the Antarctic ice sheet is growing or diminishing over long time intervals, Dr. Robert Bindschadler led an international team of glaciologists and computer scientists, including Elizabeth City State University (ECSU) students, to obtain an accurate measure of the area of the Antarctic ice sheet. Before the ice sheet's area was determined, the grounding line (GL), or boundary dividing the ice sheet resting on land from floating ice, was located by combining 2003 Landsat imagery and satellite-based laser altimetry. Landsat image data contemporary with that used to create the grounding line was compared to earlier Landsat imagery of the same area. A small ice shelf—now known as the ECSU Ice Shelf—near the eastern entrance to Pine Island Bay was previously identified as having diminished over an approximate 31-year span and the progressive reduction of its area qualitatively characterized. Here, the area loss of the ECSU Ice Shelf is quantified over time from 1972 to its disappearance in 2003. Departures from perfect geographic pixel registration in Landsat imagery of the ECSU Ice Shelf collected before 2003 was corrected with ITT's Visualization Information Solutions' ENVI image processing software using a 2003 Landsat 7 Enhanced Thematic Mapper (ETM) image as a reference. Older images from Landsat 4, 5 Thematic Mapper (TM) and Landsat 7 (ETM) were registered to conform to the common fixed geographic control points visible on both images. By overlaying the GL on the registered (warped) images, the area changes in the ice shelf were computed. An average ice shelf area was determined from four independent measurement trials for each of the pre-2003 Landsat image. Landsat Images from 2003 used in creating the GL were obtained from the United States Geological Survey (USGS) archive. The older, cloud free Landsat 4, 5 TM and 7 ETM images of the

Pine Island Glacier region were obtained from another USGS archive. Results provided: 1. A quantitative description of the disappearance of the ECSU Ice Shelf from 1972 through 2003; 2. Validation of the grounding line's actual location; 3. A survey of Antarctic coastal features that may have experienced climate related change.

Teaching Toddlers Set Theory Using Video Games

Tiffany Lewis
Spelman College
350 Spelman Ln.
Campus Box 1790
Atlanta, GA 30314
(817) 980-6136
tlewis16@scmail.spelman.edu

Alfred R. Watkins
Spelman College
350 Spelman Ln.
Campus Box 1257
Atlanta, GA 30314
alwatkins@spelman.edu

The tactile nature of elementary school children between the ages of three to five and their ability to learn using technology is motivation to teach them topics in set theory using software that will be appealing and cognitively stimulating. This software will be an online gaming experience that provides a cohesive mixture of fun and mathematics while being informative and intriguing to these students. The analysis of ways in which toddlers in elementary school learn set theory will provide incite on what type of video will be successful in teaching them these topics. The game will incorporate characters, and interesting dialogue that will capture the attention of the student while still developing their skills in topics surrounding set operations.

Be the spider of your own web

Charnae Rocker
North Carolina Agricultural and Technical State University Computer Science Department
Dr. Albert Esterline
3610 Hewitt St Greensboro, NC 27407 Apt 9 2E
1 704-222-2020
cdrocker@ncat.edu

ABSTRACT

In this paper, we will address the need and use of a content management system; discuss how we are developing a wiki site for NOAA-ISET, and the need to use MediaWiki software. There are many NOAA-ISET affiliates that are located within a lengthy range of each other, but most locations did not know about the areas of research each location takes part in. Our wiki site illustrates the utility of a specific content management system that helps our organization members stay connected and updated on all the areas of research in NOAA-ISET.

Graduate Student Paper Abstract

Classifications of Network Attacks

Monika Arrington
Norfolk State University
Norfolk, VA 23510
m.l.arrington@spartans.nsu.edu

Dr. Ahmad
Norfolk State University
Norfolk, VA 23510
aahmad@nsu.edu

J. Graham
Norfolk State University
Norfolk, VA 23510
jmgraham@nsu.edu

Hackers are demanding services and resources daily without the authorized use of any services on the network. Attacks have cause major problems for some companies and users of the system. This paper explains how attacks occur and a method to defeat that event from occurring again. This paper has layered approach on attacks along with strategies one can take to secure network. It also details the weakness and vulnerabilities that can be found within your security policy, configuration, or due to protocols lacking security features. The design of a new framework that can measure protocol levels of security is necessary.

A Practical Investigation of Browser Extensions and Their Security Vulnerabilities

Jamilia L Clary
Florida A&M University
1333 Wahnish Way BBTA 309, Tallahassee, Florida 32307
850-599-3050
jclary4@yahoo.com

The web browser is the most commonly used application on any network connected computer or smart phone, providing an interface to perform a wide range of activities including email correspondence, shopping, social networking, personal financial management, and professional business. Through the use of web browser extensions, users are able to modify browsers to meet their requirements by tailoring the browser to their needs and liking. For billions of users, there are just as many extensions. Those extensions, written by various programmers, not only provide plenty of features for their users, but also bring vulnerabilities to your computers. Extensions are not as thoroughly verified as the web browser itself and are therefore not very secure. Many contain vulnerabilities that can be exploited by malicious users. Current research only focuses on extensions for individual web browsers. This practical investigation will categorize, access vulnerabilities, and make recommendations for extensions of the popular web browsers.

A General Layered Model for the Synaptic Junction of the Brain

Aftab Ahmad, Paul H. McFall, Hargsoon Yoon and Mona Rizvi
Norfolk State University
700 Park Avenue, Norfolk VA 23504
{aahmad@nsu.edu;p.h.mcfall@spartans.nsu.edu;hyoon@nsu.edu;mrizvi@nsu.edu}

Various advancements in modern day technology have led scientist on a quest to reverse engineer the brain. However, understanding the various complexities of neuronal communication has proven exceptionally difficult. In this paper, it is suggested that the process of neuronal communication should be viewed as modular, consisting of many layers. Each layer is defined by the mechanisms in which they incorporate, including the neurotransmitters, vesicles, action potential and all other communication components. We theorize that with the assistance of a layered approach, the problem of modeling interneuronal communication will immensely decrease in complexity. Scientist will only need to model a single layer of the neuron before inferring the information essential to the next.

The Utilization of Agents in a Wireless Sensor Network

Tori R. Patterson
Department of Computer Science, North Carolina A&T State University
Greensboro, NC 27411
1-443-370-1198
tp980356@ncat.edu

ABSTRACT

This paper discusses the integration of a multiagent system into a wireless sensor network to create a more efficient system better able to capitalize on the networks set up and capabilities. Sensor webs are a networked group of sensor nodes linked together physically or wirelessly to create a web of data detection and transfer. Through the incorporation of software agents as a multiagent system, the hierarchy of data transfer can be customized to varying network necessities while staying flexible enough to update as needed to meet the needs of state or situation changes. The agents are also able to break down large tasks into smaller subtasks in order to simplify complex tasks for more efficient processing.

A Study on the Viability of Hadoop Usage on the Umfort Cluster for the Processing and Storage of CReSIS Polar Data

Je'aime Powell
Elizabeth City State University
Box 672 1704 Weeksville Road, Elizabeth City, NC 27909
jeaime.powell@cerser.ecsu.edu

The primary focus of this research was to explore the capabilities of Hadoop as a software package to process, store and manage CReSIS polar data in a clustered environment. The investigation involved Hadoop functionality and usage through reviewed publications. The team's research was aimed at determining if Hadoop was a viable software package to implement on the Elizabeth City State University (ECSU) Umfort computing cluster. Utilizing case studies processing, storage, management, and job distribution methods were compared. A final determination of the benefits of Hadoop for the storing and processing of data on the Umfort cluster was then made.

Smart Meter Design for Wireless Advanced Metering Infrastructure

DeMarcus M. Thomas, Aftab Ahmad, Luay A. Wahsheh, Jonathan M. Graham, Aurelia T. Williams, Felicia R. Doswell, Cheryl V. Hinds and Sandra J. DeLoatch
Information Assurance Research, Education, and Development Institute (IA-REDI), College of Science, Engineering and Technology (CSET) Norfolk State University (NSU)
Norfolk, VA, 23504, United States
d.m.thomas17200@spartans.nsu.edu, {aahmad, lawahsheh, jmgraham, atwilliams, fdoswell, chinds, sjdeloatch}@nsu.edu

Celeste Matarazzo
Lawrence Livermore National Lab
Livermore, CA 94551-0808
celestem@llnl.gov

In this paper, we discuss the design of a smart meter for secure operation and automatic incident response in an advanced metering infrastructure (AMI). It is assumed that the meters are interconnected in a mesh as well as infrastructure WLAN using IEEE 802.11 standard. We discuss various communications and security interfaces of the smart meter. The multi-pronged goal of these interfaces includes controlling the radio fingerprint of the smart meter network on the one hand, and being to detect the position and movement direction of an attacker on the other hand. We propose a novel alias-based anti-MAC-address-spoofing algorithm that provides a quick fix for respective attacks. NS-3 simulation is also discussed for the current phase of the project.

Dynamic Auctioning Algorithm Program (DAAP)

Christopher I. G. Lanclos
Norfolk State University
Norfolk, VA 23503
(985) 687-6602cilanclos@gmail.com

Recently, the realization of effective and efficient use of resources is essential to the quality of life. These resources can be computational, physical, time, people, etc. The efficient allocation of these resources is known as the assignment problem. There are several algorithms that can be used to assign resources. One type of algorithm that can be used is an auction. In this paper, three auction algorithms will be discussed. They are the English auction, the Dutch auction, and the Vickery auction. Additionally, a proposed design of a program that will enable comparison of these three auctions will be discussed along with the benefits of having such a program to evaluate the use of auctions for solving assignments of resources in real world applications.

Student Poster Abstracts (Undergraduate and Graduate)

Puzzle Play – An Android Application

Lino Agli
Computer Science & Information Tech
University of the District of Columbia,   Washington, DC 20008
1-301-385-5078   perfectionisms@gmail.com

ABSTRACT

This poster shows the development of an Android application for tablet or phone. The app creates a one or two person jigsaw puzzle game. The unique feature is the use of your own photo gallery as the basis for a puzzle to solve. The app allows the movement of pieces on top of one another, using transparency, keeps count of the number of moves, and lets the user pause and restart later. Creating an algorithm for dividing the picture into pieces was a challenging aspect of this project. Mobile application development teaches problem solving, software engineering and operating system fundamentals.

PR2 Head and Hand Manipulation through Teleoperation
Using an Attitude and Heading Reference System

Jason Allen, *SUNFEST* – (EE), University of the District of Columbia
Advisor: Dr. Camillo J. Taylor

ABSTRACT

Previous research using Vicon, a motion capture system, has been used to tele-operate the PR2 robot's head using tracking markers attached to the user's head mounted display (HMD). However, the Vicon system requires special cameras, rigging, and an extra software suite to perform this task. Our current goal is to find a smaller, mobile alternative that is at least as accurate as the Vicon system in order to manipulate the PR2 robot, from Willow Garage. The CHR-6dm Attitude and Heading Reference System (AHRS), from CH Robotics, meets our goal. The CHR-6dm is the size of a quarter, can be easily attached to the user's HMD, and its driver and programs can be added to the existing robots operating system. Shown to be an acceptable replacement to the Vicon system, the AHRS, in conjunction with actuators and tactile sensors, is being considered for controlling the PR2's grippers and contributing to a more complete tele-immersion experience.

Blackout: A Robot for Household Emergencies

Samantha L. Allen	Hasani Burns	Chutima Boonthum-Denecke
Hampton University	Hampton University	Hampton University
Department of Computer Science	Department of Computer Science	Department of Computer Science
Hampton, VA-23668	Hampton, VA-23668	Hampton, VA-23668
757-727-5552	757-727-5552	757-727-5082
samantha.allen@my.hamptonu.edu	hasani.burns@my.hamptonu.edu	chutima.boonthum@hamptonu.edu

ABSTRACT

The robot, nicknamed "Blackout," was created in order to be an emergency robot with the goal of assisting one in any number of household emergencies. Though limited in resources, we have produced a robot with a goal of assistance in small, but vital ways to a young child home alone, a senior citizen, or even one with a disability. The occurrence of a sudden blackout can be quite frustrating at home, especially if you do not have a flashlight handy. With this in mind, we created our robot, "Blackout," using the Handy Cricket Board and Logo program, to use flickering lights and IR sensors located at its front and rear to sense you, as well as objects around you, in order to guide you around a dark home. When activated by pressing 1 button, Blackout's flashing lights will turn on with no hesitation and Blackout will become one's "eyes" in a sense. While remaining a stable distance behind Blackout, a person will be guided through rooms until they reach their desired destination without bumping into anything. The building of Blackout began with the formation of a blueprint design of what Blackout would look like. Using Erector Set pieces, a remote-controlled car base, nuts, screws, IR sensors, small light bulbs, a motor, and Handy Cricket Logo board and software, Blackout was constructed from scratch. Our design is simple, but very effective for our short term goals. The robot is presently running on four AA batteries, so our power supply is currently limited. Future goals have been set and ideas for improvement are continuously being considered.

**Development of a Web Application to Generate Walking Directions Between Locations
on the Campus of Elizabeth City State University**

Nyema Barmore
Elizabeth City State University
nrbarmore351@mail.ecsu.edu

Mashups are an exciting genre of interactive Web applications that draw upon content retrieved from external data sources to create entirely new and innovative services [1]. The purpose of the Mobile Applications Research Team is to create an interface mashup in which geographic information and meta data from buildings located on the campus of Elizabeth City State University (ECSU) can be presented to users via mobile platforms. The project includes HTML5 programming which referenced a database that housed information such as location, building establishment date, academic departments, academic programs, and faculty leadership. The information was then compiled using a PHP Hypertext Processor form (PHP) to populate a MySQL database. HTML5 coupled with PHP programming was then used to render a mobile web page with both map and database information. Using Google Mapmaker®, paths, streets, and buildings were created in appropriate geographic locations on the ECSU campus. The Google Maps Application Programming Interface was then used to generate Uniform Resource Locator's to both retrieve user Global Positioning System coordinates and create walking directions to selected locations. The user has the ability to generate walking directions to locating on the university campus.

WRF Verification Visualization Application

LaEsha Barnes
Mississippi Valley State University
1835 Old Hwy 3, Edwards, MS 39066
601-954-2188   Laeshabarnes@gmail.com

The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and the enhancement of the national economy. Some forecasted data used by the NWS is produced from the Weather Research and Forecasting (WRF) Model, a next-generation mesoscale numerical weather prediction system designed to serve both operational forecasting and atmospheric research needs. In operational forecasting, the data from the WRF is analyzed and interpreted and provided to the public. The accuracy of the model is vital to the safety of the people, as the data from the WRF depicts what areas are subject to suffer during severe weather. In an effort to test the WRF data output, forecasters currently analyze the data from previous events and attempt to correlate those events with Local Storm Report (LSR) locations. This mechanism serves as evidence that severe weather occurred, yet it is a cumbersome and tedious process that leaves room for human error.

Earth on the Go: A Mobile Website for Data Visualization

John Bell   Dan Pisut (Advisor)
Mississippi Valley State University   NOAA NESDIS/Environmental Visualization
                                                        Laboratory(EVL)
john.bell@mvsu.edu   dan.pisut@noaa.gov

Being able to access information and other data at any given time is becoming increasingly critical in today's society. Through its website, the Environmental Visualization Laboratory (EVL) works to provide the public with detailed visuals and reports regarding past and present environmental conditions as well as future outlooks. However, the site's graphics-intense layout and imagery resolution is not ideal for mobile devices. Within the past 10 years, mobile phones have transitioned from being only a telecommunication device to a popular mode of obtaining information. In an effort to keep NOAA up-to-date with current technological standards, this project focused on developing a modified version of the existing website capable of being accessed through cellular phones and other mobile devices. Completion of such a task required extensive research and knowledge of computer languages utilized by various mobile web browsers. In addition, testing was conducted on multiple mobile platforms. The results of this project demonstrated how to successfully integrate selected features of a standard website into a mobile version, while also identifying the best practices for the future design of other mobile websites for NOAA.

Analyzing MapReduce Frameworks Hadoop and Twister

Joyce Bevins
Elizabeth City State University
blessed1989@hotmail.com

Thilina Gunathne
Indiana University
Bloomington, IN 47405

The primary focus of this research was to analyze the attributes of MapReduce frameworks for data intensive computing and to compare two different MapReduce frameworks, Hadoop and Twister. MapReduce is a data processing framework that allows developers to write applications that can process large sets of data in a timely manner with the use of distributed computing resources. One of its main features is the ability to partition a large computation into a set of discrete tasks to enable parallel processing of the computation. Google, the most popular search engine on the internet, uses MapReduce to simplify data processing on its large clusters. We analyze the performance of Hadoop and Twister using the Word Count application and compare the scalability and efficiency of the two frameworks for this particular application.

Next Generation Air Transportation System: Error Awareness, Training, & Performance

Ryan Boles
Morehouse College
830 Westview Dr. SW
Unit #142851
Atlanta, GA 30314
01-713-899-3006
ryan.c.boles@gmail.com

Nora Gomez
University of Southern California
University Park Campus
Los Angeles 90089
01-818-730-8433
gomezgar@usc.edu

Lindsay Sturre
Clemson University
307 Kings Way
Clemson, SC
01-843-368-9034
lsturre@g.clemson.edu

This study investigates how to best train air traffic controllers (ATCs) on the Next Generation Air Transportation Software System (NextGen) that is currently under development. Because of the high demand in air transportation expected by 2025, the goal of NextGen is to increase aircraft capacity without compromising safety.

Designing and Implementing a Self-Assist Robot

Ric'Sheika Branch
Winston-Salem State University
rbranch106@rams.wssu.edu

Faculty Mentors: Dr. Elva Jones,
Dr. Rebecca Caldwell
Winston-Salem State University
jonese@wssu.edu   caldwellr@wssu.edu

This project designs and implements a self-assist robot called the K.A.R.I. This self-assist robot will allow the elderly and people with disabilities to better maintain their daily routines. It will be able to retrieve objects such as their medication or personal care items and deliver them to the humans. The primary function of the K.A.R.I. is to perform difficult tasks for people with disabilities. This solution combines the Calliope, Kinect and Ipad 2 technologies to perform robotics tasks previously relegated to humanoid robots.

The SnackBot: Vision and Perception with Audio and Video Captures Using gStreamer.

Hasani Burns
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5552
hasani.burns@
my.hamptonu.edu

Sara Kiesler
Carnegie Mellon University
Department of Computer Science
Pittsburgh, PA-15213
412-268-7884
kiesler@cs.cmu.edu

Chutima Boonthum-Denecke
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5082
chutima.boonthum@
hamptonu.edu

The Snackbot was created to autonomously navigate the floor area, and deliver food items ordered by occupants of the offices. The Snackbot though, has the potentiality of not only becoming much more than a robot that delivers snacks, but also being a beacon of innovation for robotics in general. A robot that can traverse a mapped area, recognize others around it, interact directly and personally, and respond to humans and real-time, in real life situations is where the future of robotics lies. With this poster paper and presentation, the exploration on capturing audio and video, and how they were implemented into the Snackbot are described.

The Use of the Math Sprint in a Tutorial Program for Sixth Grade Students to Improve End of Grade Test Scores

Dalesha Cartman
Mississippi Valley State University
14000 Hwy 82 Hwy
MVSU 5977
Itta Bena, MS 38941
(312)391-9590
dhdcartman@gmail.com

Marvin Elder II
Mississippi Valley State University
P.O BOX 1385
Indianola, MS 38751
(662)207-0172
Elder.marvin38751@gmail.com

Sean Leavy
University of Maryland, Baltimore County
1493 Warfield Road
Edgewater, MD 21037
(443)956-5526
Sean13leavy@yahoo.com

Team Mentors: Dr. Darnell Johnson, Kaiem Frink, Mr. Brian Jordan.

What is the effect of a math sprint tutorial model on Mathematics achievement of sixth graders at Elizabeth City Middle School in Elizabeth City, North Carolina? A math sprint tutorial process was used during a three-week study with a group of 13 sixth-grade students to increase test scores from the previous 2011 Spring end of grade (EOG) test. The data, gathered from the post-test as a result of the series of tutoring sessions, was compared with the scores from the 2011 Spring EOG. Research studied the improvements made in scores on the North Carolina mathematics state test. The North Carolina Mathematics Standard Course of Study provides a set of mathematical competencies for each grade and high school course to ensure rigorous student academic performance standards that are uniform across the state. It is based on a philosophy of teaching and learning mathematics that is consistent with the current research, exemplary practices, and national standards.
The North Carolina Mathematics Standard Course of Study is organized in five strands or goals for K-8: Number and Operations, Measurement, Geometry, Data Analysis and Probability, and Algebra. (Geometry and Measurement are combined for grades 9-12.) The objectives for each goal progress in complexity at each grade level and throughout the high school courses. It is the framework upon which classroom instruction and assessment should be planned. It is the ultimate guide for textbook selections and the foundation of the North Carolina testing program. A variety of North Carolina Department of Public Instruction support documents articulate and enhance this curriculum. The Standard Course of Study describes the mathematical concepts, skills, operations, and relationships that are the significant mathematics that all North Carolina students should learn and understand. This is the mathematics that will give North Carolina students the greatest opportunity to shape their futures.

HTML-Based Log File Generation via C++ Class Developing

Jenaelle A. Coleman (Thurgood Marshall College Fund)
Mississippi Valley State University
Computer Science
Undergraduate-Senior
jacoleman@mvsu.edu
Mentor: Mr. Kenneth Li / GSFC Code 561
Flight Data Systems and Radiation Effects Division

The Flight Data Systems and Radiation Effects Division of NASA Goddard Space Flight Center is responsible for design and development of data system boxes, components, and new technology for spacecraft. The engineers in the division also provide support to existing missions both before and after launch to solve technical problems. Before any components are placed within the data system boxes, different tests are executed to ensure the satisfaction of each component. The results from each execution are recorded as a log file. A log file is a text file that lists all the actions that have occurred from a particular execution or test. The generated log file was often complex and hard to traverse making the engineers' job very inflexible. Since most of the tests are executed by hardware engineers, the task of identifying errors has become very complex. Due to the length and unformatted text of the log files, engineers often time found it very problematical to maneuver through. This project entails the generation of a HTML-based log file through the development of a C++ class. Within the C++ class are function calls to produce the HTML file. The HTML-based log file contains collapsible and expandable sections of text to display each result. Since there is no known coding to collapse or expand data in sections for C++, another function was created to do so. This function contains JavaScript coding. Following the execution of all coding, the HTML-based log file will open within the default browser on ones testing station. Upon opening of the file, all messages are set at collapsed by default. If any errors are found during testing, there will be an indication in the HTML-based log file by displaying messages and errors in red. The HTML-based log file is to provide the hardware engineers a graphical user interface that will be used to read and identify errors in test results on a log file.

On Developing an App to Assist 1st Responders in the Digital Forensic Evidence Collection Process

Soniael Duncan
Jackson State University
Department of Computer Science Jackson, MS 39217
601-979-2105
soniael88@gmail.com

April Tanner, Ph.D.
Jackson State University
Department of Computer Science Jackson, MS 39217
601-979-3302
april.l.tanner@jsums.edu

Loretta Moore, Ph.D.
Jackson State University
College of Science, Eng. & Tech. Jackson, MS 39217
601-979-0552
loretta.a.moore@jsums.edu

Digital Forensics involves the identification, preservation, collection, examination, and analysis of digital devices. These devices include, but are not limited to, digital cameras, flash drives, computers, internal and external memory drives, mobile devices, etc. Some mobile devices that can be examined include graphic tablets, cell phones, smart phones, DVDs, MP3s, and etc. Digital evidence has to be collected and examined in a way that does not jeopardize the integrity of the evidence not only at the crime lab, but at the scene of the crime. Generally, the first individuals to arrive at a crime scene are referred to as first responders, and they can play a pivotal part in preserving or contaminating the digital evidence. In this paper, we discuss the need for mobile applications that can guide first responder investigators in the preservation and containment of digital evidence at a crime scene, and we present the features of a general mobile application we developed that can be used to assist first responders in data collection and acquisition at the scene of the crime. Future work includes modifications to the proposed mobile application and developing an app that can aid first responders in authenticating and verifying evidence during the acquisition process.

Charles Creek Flood Zone Modeling: A Correlation Study of Environmental Conditions Versus Water Level in the Pasquotank Watershed

Nartezya Dykes
Spelman College
350 Spelman Lane, SW
Atlanta, USA
1-504-237-3116
ndykes@scmail.spelman.edu

Lakedrick Easley
Mississippi Valley State University
100 Nelson Street
Itta Bena, USA
1-662-299- 5214
lekedrickeasley@yahoo.com

Je'aime Powell
Elizabeth City State University
1704 Weeksville Road
Bloomington, USA
1-252-335-8524
jeaimehp@gmail.com

The Charles Creek area in Elizabeth City, NC experiences frequent flood conditions seemingly unrelated to rainfall amounts. The purpose of this study was to compare barometric pressures, lunar cycles, wind directions, and wind speeds with water depth readings of Charles Creek (a tributary of the Pasquotank River). For roughly thirty days data was collected by use of a static remote imaging system to measure water depth through pixel enumeration and referencing through remote sensing techniques coupled with custom image processing software. Additionally, environmental data was collected through Elizabeth City State University's National Renewable Energy Laboratory Weather Monitoring Station. All of the data, aside from the pieces of faulty images that were captured by the imaging system, was correlated using MINITAB (R) to find an equation to approximate a model of the rise of the Creek water level based upon environmental conditions. The developed regression equation had a coefficient of determination of 42%; this means there was a 42% probability the model was useful at predicting the pixel count based on environmental variables. This was considered a very decent r-squared variable in the fact that there were a number of different variables. Another significant finding was that lunar cycles alone had a coefficient of determination of 40.5%. Therefore, this was a sign that our hypothesis was partially correct. This project is at its first stage and has the potential to be significantly improved.

A Trummer's Problem Solver Using MPI.

Tarana Farhat
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5552
tarana.farhat@
my.hamptonu.edu

Stephen Providence
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5552
stephen.providence@
hamptonu.edu

The subject of structured matrices are a well documented area where basic arithmetic and BLAS level 2 for said structured matrices and dense vectors may be computed. Serial computations with these operations yield super fast asymptotic upper bounds on execution time with the added benefit of numerical stability. The parallelization of these operations in MPI is performed to examine HPC performance attributes. The difficulty lies in ensuring serial computation characteristics while achieving the predicted speedup associated with parallelizing structured matrix BLAS level 2 computations. Such research is

foundational to many of the computations performed in high performance computing, signal processing, and the speedup predicted is dramatic.

Designing Interactive Learning Lessons to Teach Youth About Computer Forensics

Jamika S. Geter
Norfolk State University
j.s.geter@spartans.nsu.edu

There are a limited number of employees in the forensic field, although there is a great and extensive need for them. Being that computers and the Internet are the fastest growing technology used for criminal activity, it is important to have computer forensic specialist in the years to come. In this paper, the basic knowledge of computer forensics will be incorporated with the design of video game/interactive lessons, so that youth are attracted to pursue a career in the field of computer science to become computer forensics specialist. Our research shows that computers and technology are advancing and have become great learning tools for kids, making learning fun and exciting for our youth today.

Biology Study Aid: Fetal Pig Dissection App for iPhone

Luis A Gonzalez
University of the District of Columbia
luisgjr@ymail.com

Using a smart phone as a study aid is an innovative use of technology in education. This project involves the development of an iOS application that will help students learn the anatomy of a fetal pig for a biology laboratory course. This app will help students who will be doing fetal pig dissections better prepare for the tests that follow those dissections. Created as part of my coursework for the Mobile Application Development class at the University of the District of Columbia, this project has contributed to my knowledge of programming, software design and creative application development. The FPDA displays pictures of the different structures inside a fetal pig. The user can select one of several body systems it will display relevant pictures. Through the use of a picker view, you can cycle through the different structures in each body system and it will give you a description of their function.

Wii Nunchuk Controlled Dance Pleo! Dance! to Assist Children with Cerebral Palsy by Play Therapy.

Jennifer Gregory
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5552
jennifer.gregory@
my.hamptonu.edu

Ayanna Howard
Georgia Institute of Technology
School of Electrical and Computer
Engineering
Atlanta, GA-30332
404-894-2901
ayanna.howard@
ece.gatech.edu

Chutima Boonthum-Denecke
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5082
chutima.boonthum@
hamptonu.edu

Children with cerebral palsy have difficulty moving their hands and muscles due to developmental issues. One way to assist these children is by having them participate in physical therapy. The best form of physical therapy for children is playing. Playing is a natural activity for children, and it also helps in furthering the developments of muscles. This form of therapy is perhaps a greater choice for children because it keeps the child engaged due to the interest the child holds in the activity. By integrating two projects done by previous students, a Pleo that is controlled by a Wii Nunchuk will be able to teach Pleo how to dance. The child will be engaged in this activity for long durations because there are many variations of dance that the Pleo can learn by moving many body parts. Children using this toy will have continuous movement in their arm muscles by moving the Nunchuk for the duration of the activity. Also, this toy will not only have children with severe disabilities feeling equal to their non-disabled peers by allowing them to use controllers found on many game consoles, but it in addition, this toy will enhance the child's self-esteem and confidence by allowing them to control the outcome of the Pleo.

A Study to Understand the Potential Vulnerabilities to the Foundations of Historic Structures in Coastal Areas

Cedric Hall
Elizabeth City State University
Box 672 1704 Weeksville Road
Elizabeth City, NC 27909
cedriclhall@yahoo.com

Dr. Michael Routhier
University of New Hampshire
105 Main Street
Durham, NH 03824
(603) 862-1792 mike.routhier@unh.edu

Sea level rise, one of the most important manifestations of climate change is expected to result in increased coastal erosion and storm surge flooding. This work reports on a project undertaken to assess the vulnerability of foundations of historic structures in coastal areas to the potential consequences from climate change resulting from increased storm surge flooding. Foundations of historic buildings are especially vulnerable to the seepage and ground water intrusion. Many historic structures themselves are used to house valuable historic collections making it all the important to preserve and protect these structures. Data collected from a field subsurface geophysical survey, geospatial field survey, and a simulation to understand the hydrological conditions of the site useful to build an understanding of threats to foundations of historic structures located on the coast.

Information Flow Model of a Single Neuron

Jasmine Berry
College of Science, Engineering and Technology
Norfolk State University
j.a.berry14158@spartans.nsu.edu

Adrienne Haynes
College of Science, Engineering and Technology
Norfolk State University
a.m.haynes@spartans.nsu.edu

Dr. Aftab Ahmad
College of Science, Engineering and Technology
Norfolk State University
aahmad@nsu.edu

In his lecture, Professor Larry Yaeger has identified 20 different models of a biological neuron. These include tonic, phasic, and inhibition-induced spiking, spike latency, rebound spike, and spike frequency adaptation. Also included are accommodation, DAP, bistable, threshold variability, sub threshold oscillations, class 1 and 2 excitable, and mixed mode. Additionally mentioned is tonic, phasic, and inhibition-induced bursting, along with rebound burst. A multitude of models are required because none of them describe the neuron exactly. As a result, one aspect that can be investigated precisely is the information inputs and outputs of a biological neuron. These include electrical splicing, ion channel, and neurotransmitters. In this project, we view the neuron as a "black box" consisting of other black boxes as information elements. Our goal is to identify the information flow in and out of the neuron. Referencing *The Neuron* [2] by Professor Irwin Levitan and Leonard Kaczmarek, we seek to create a new model of the biological neuron.

Building a Small Low Cost Effective Robot Swarm

Brandon Heath
Winston-Salem State University
bheath108@rams.wssu.edu
Dr. James McClurkin – Rice University
Faculty Mentors: Dr. Elva Jones, Dr. Rebecca Caldwell
Winston-Salem State University
jonese@wssu.edu   caldwellr@wssu.edu

The research conducted consisted of two assignments, both of which played a critical role in the overall development of the robot swarm. The first consisted of programming and testing radio transmitters and receivers for the for robot swarm. A Nordic transceiver was used to transmit and receive data between our two test radios. The key element of the radio test was making sure the transceiver was able to effectively transmit packets of data across a wide range of test locations. The implication of these tests would determine whether the specific radios were able to with stand a wide variety of location and effectively transmit data. The next part of the assignment consisted of camera tracking, which used OpenCV, an open source computer vision software, and Microsoft Visual Studio to detect IR blobs for identifying multiple robots. Each robot has a unique IR beacon that is recognized by the camera and is used   for tracking each robot. The technical aspect of this project include programming the camera software to recognize IR blob and creating a 2D plot to track the robots. These two assignments were a small part of a bigger goal to build a small low cost effective robot swarm that can interact with each other in various ways.

Servo Services
Troy Hill
Winston-Salem State University
thill108@rams.wssu.edu

Faculty Mentors: Dr. Elva Jones, Dr. Rebecca Caldwell
Winston-Salem State University
jonese@wssu.edu   caldwellr@wssu.edu

Servo Robotics, a field that emphasizes a large output from a small input, could be utilized for multiple assistive objectives, most importantly the surgical field. Servomechanism usage stretches from Walt Disney's animatronic park robots to mechanical knee and arm prostheses, and has made enormous strides in the technology available to us today. The same servo concept used to create a simple water gun can be applied to a tape recorder or even an assistive prosthetic leg. The core of a servo component lies with the electric motor, position feedback potentiometer, reduction gear, and actuator arm. Each of these working together creates a spinning output and when applied to gears and other mechanical devices a servomechanism is the product. At home a mobile mechanical arm could be of great assistance with something as general as bothersome chores. The goal of this project is to design a robotic arm that could be used in the household. An arm could be programmed to take out the trash, bring in the groceries, modified to sweep and mop the floor. What makes the idea of a mechanical arm practical is its mobile and programmable versatility. The mobile unit allows the arm a greater degree of motion. A framework platform could be applied to all models with different desired task programs made as accessible as cell phone apps. A mobile arm would be of helpful assistance to the elderly and disabled as well. Tasks such as grabbing objects at varying levels of height, carrying heavy loads, and clearing a walkway are a few inconveniences that could be programmed.

Weight and its Impact on Locomotion Robots
Arsenio Jeffries
Winston-Salem State University
ajeffreys111@rams.wssu.edu

Faculty Mentors: Dr. Elva Jones, Dr. Rebecca Caldwell
Winston-Salem State University
jonese@wssu.edu   caldwellr@wssu.edu

When you hear the term locomotion one thinks of it as an act of moving from place to place; but it is actually much more complex than that. There have been new machines created that can perform alternate tasks while maneuvering through tasks such as; taking video surveillance, cleaning, entertaining, and performing tasks to make the lives of humans easier.   Making a robot move from one spot to another can easily be done, but how efficient does the robot perform this task. This research project investigates how weight effects the performance of assistive locomotive robots, and what maneuvering tool works best.

Using Bioinformatics for Gene Mapping and the Analysis of MicroRNA

Ashley Jones
CIS Dept.
350 Spelman Lane
Atlanta, GA 30314
(301) 356-3135
ashleyj38@gmail.com

Dr. Alfred Watkins
CIS Dept.
Spelman College
350 Spelman Lane
Atlanta, GA 30314
alwatkins@spelman.edu

Dr. Hong Qin
Biology Dept.
Spelman College
350 Spelman Lane
Atlanta, GA 30314
hqin@spelman.edu

Small, non-coding RNA's, called microRNA or miRNA, influence certain biological responses and conditions. Recent studies have revealed a strong relationship between certain microRNA and the development of cancer. This discovery drives us to further explore microRNA and to determine how it is developed and how it can be prevented or changed. The importance of studying the structure of these microRNA has motivated us to seek to develop technology to map gene structures and locate the microRNA within them.   Several maps intended to assist with this analysis have been developed up until this point, such as the gene map and the breakpoint map. However, the use of these maps can become complicated and more time-consuming. Therefore, we are seeking to develop a technological alternative to these mapping techniques that is effective, accurate, and produce results quickly. To begin mapping these gene sequences, we have developed algorithms in python to receive a primary gene sequence and identify secondary structures based off of that sequence. The advantage of using python as a scripting language is that it is more easily read and understood by the biologists who need to manipulate and use these programs. Our current developing program in python will be transformed into a web application, giving access to scientists on a large scale. Graphical elements will be added to the program to produce an interface that is easier to use and appealing to the eye. The end goal of this research is to develop a bioinformatics tool set that would allow biologists to input gene sequences and analyze subsequent structures, as well as perform other functions of gene mapping and analysis.

Sensors Can Improve the Use of Assistive Robotics

Shaun Lumpkin
Winston-Salem State University
slumpkin109@rams.wssu.edu

Faculty Mentors: Dr. Elva Jones, Dr. Rebecca Caldwell
Winston-Salem State University
jonese@wssu.edu   caldwellr@wssu.edu

The world we live in today is a very fast paced one when it comes to technology. One of the ways that technology has really impacted the world is through the use of assistive robots. There is one key feature on an assistive robot that gives it the ability to achieve several tasks when helping others, and that one key feature is sensors. One group of people that need assistance is the blind, and being that they are missing one of their most important senses, sight, a robot that contains sensors is a very beneficial robot to have assisting you.   Robots designed to help assist the blind, are very essential to people whose sense to see is no longer present. Assistive robots can really make an enormous difference and impact on their lives.   An assistive robot can be programmed to do the same exact task, the same exact way every time. So in other words you will basically get the same exact results each time. An assistive robot is not only going to use its sensors to guide you throughout your daily life, but they are also able to use their sensors, to recognize certain objects, to be able to guide you in the dark, and also be able to detect at a faster pace. None of this would even be possible without the help of sensors.   This research project investigates how use of sensors on assistive robots improves the performance of the robot.

Secret Text and Selective Twitter—Android Application Projects

Freddy Montano
Computer Science & Information Tech
University of the District of Columbia
Washington, DC 20008
1-571-344-4611
freddy.montano@udc.edu

This poster describes two Android applications, which can be used on a phone or tablet. Secret Text -- Text messages are a common way to communicate, but can cause problems if someone else reads them on your phone. Encoding the message using a common password allows messages to remain "secret" until viewed by the party they are intended for. Selective Twitter -- Follow a twitter feed about anything or from anyone, without being a "follower" of the twitter originator. Using the twitter data base, this application searches for specific users or content.

Identifying Uniqueness in High Dimensional Social Science Datasets

Cornelius Myles, Asha Saravanamohan.
Mississippi Valley State University, Itta Bena, MS
Jackson State University, Jackson, MS.
i.corneliusmyles@yahoo.com

Social scientists at the Kinsey Institute for Research in Sex, Gender and Reproduction gather large amounts of sensitive data from individuals. These datasets are high dimensional, which presents many opportunities to characterize participants in unique ways. The primary purpose of this project is to identify unique characteristics in high dimensional datasets and determine whether uniqueness leads to re-identification. Using data collected from surveys supplied by the Kinsey Institute, certain attributes were combined to determine which characteristics make individuals unique in a dataset. Results showed that an average of 98.72% of people could be re-identified in the datasets.

A Survey of Technology Applications for Promotion of Nutrition and Physical Activity

Darian Nelson
Prairie View A&M University P.O. Box 519, MS 2515 Prairie View, TX 77446
dnelson2@student.pvamu.edu

Poor nutrition and lack of exercise are at the root of many health related problems affecting people all over the world; many health problems are associated with poor diet and exercise. Obesity is a problem faced by a large percentage of Americans. Obesity is caused by both poor nutrition and lack of exercise. A lot of research is being done to find ways to prevent as well as reduce this problem. There has been a lot of recent work in the area of mobile software applications and gaming consoles to support individuals in managing their health and physical activity. Applications for mobile devices can be categorized in a number of ways including applications that focus solely on nutrition from automated shopping lists to food recommendations at restaurants and applications that serve as trackers from calorie trackers to exercise trackers. Exergaming is a term used to describe video games designed to provide physical activity as well as enjoyment. The major gaming consoles on the market today all have exergames available for customers including the Wii from Nintendo, Playstation Move from Sony, and Xbox 360 Kinect from Microsoft. This poster provides an overview of advancements in technology for the promotion of nutrition and physical activity and provides a categorization for the plethora of health related mobile applications currently available for the Android and Apple platforms.

Mitigation of Web Application Side Channel Leaks

Ehijele Olumese
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5552
ehijele.olumese@
my.hamptonu.edu

Yen-Hung Hu
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5552
yenhung.hu@
hamptonu.edu

With the increase of companies using web application for costumer convenience, web application security is of even greater importance. Sensitive information is traveling back and forth between the user and the company's servers, and eavesdroppers are getting better and deciphering network traffic based on patterns in packet sizes and their timing. This is a major problem for companies and corporations using web applications because their customer's information and data are at risk of getting leaked. To protect such sensitive information, web application developers are aware of the importance of searching for more efficient ways to ensure their products security. In this research, we study and investigate potential leaks of several profit and nonprofit web applications which involve transactions of sensitive information. We also depict a novel approach that is able to improve the performance of leak detection.

Teaching Middle School Mathematics through Educational Games

Christopher Cameron Peele
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5552
christopher.peele@
my.hamptonu.edu

Ehijele Olumese
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5552
ehijele.olumese@
my.hamptonu.edu

Jean Muhammad
Hampton University
Department of Computer Science
Hampton, VA-23668
757-727-5552
jeana.muhammad@
hamptonu.edu

Within the past decade there has been national concern for the growth and development of K-12 students within STEM, particularly for the areas of mathematics and computer science. The Department of Computer Science and the Department of Mathematics are currently in collaboration with middle school teachers to provide game prototypes to support classroom learning in mathematics. Computer Science students are developing computer game prototypes as tools with emphasis on integrating into those skill-building tasks, which would prepare students for the SOL grade level tests. The students were given the mathematical skill-building task as their targets. The first three game prototypes will be tested in mathematics classes of two different middle schools in Spring 20012.

The Lost Java Code: Teaching Decision Structures in a Game

Emanuel Smith, Matthew Perkins
Advisor: Jinghua Zhang, PhD
Department of Computer Science
Winston-Salem State University, Winston-Salem, NC
esmith110@rams.wssu.edu. mperkins109@rams.wssu.edu, zhangji@wssu.edu

A game-like instructional module named "The Lost Java Code" has been developed to enhance student learning in the computer programming course. The Lost Java Code combines the appeal of playing casual games with the lessons of the classroom to help novice programmers better understand decision structures such as *if, ifelse, if-else-if* and *switch* statements in a fun way. It has two different modes: Free Play (FP) and Learning and Practicing (LP). FP mode allows the user to fully enjoy the gameplay experience by allowing the user to play the game without being tested in programming concepts. This keeps the player's interest high and the gameplay fast paced. The LP mode involves several levels and each level consists of two parts. In the first part of the LP mode, the player has to stop at the information booth to learn the programming concepts and then use those concepts to conquer the obstacles on each level. Each obstacle requires the player to answer a multiplechoice question. To prevent the player from guessing, the game will deduct health points each time the question is answered incorrectly. Once all the questions are answered correctly, the player will proceed to the second part of the LP mode. In this part, the player will be presented a *Programming Challenge* where the player is given a problem and a partially written code. The player must complete the coding correctly to move on to a higher level. Initial test and evaluation result show that this learning approach is very promising and has great potential to enhance student learning. The poster presentation will give a detailed description of this instructional module.

Analysis of Survey Results by Geographic Sector and Zip Code

Kendra L Thompson
Mississippi Valley State University, P.O. Box 145, Darling, MS 38623
662-710-3024   Kendra.thompson@mvsu.edu

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) is committed to serving the needs of all of its customers. The NWS sponsors an annual Customer Satisfaction Survey for its users. The survey looks at various shared and unique aspects of the weather services provided, and request that its respondents rate the NWS effectiveness in meeting their forecast and weather data needs. The survey produces ample data that aids NWS to improve or modify their services. The results of the National Customer Satisfaction Survey, particularly the open-ended comments that allow respondents to offer a "free-form" response for recommendations or suggestions about the quality and usefulness of NWS forecast products and services, are used to improve approaches made to reduce loss of life, property, and distribution of high-impact events. Different methods were used to associate geographic sectors with zip codes within every sector. The open-ended comments of the survey were captured and evaluated by postal zip codes and geographic sectors. Common themes such as keywords were derived to analyze recurring themes that are important to the NWS customers. A Visual Basic application was created to search on keywords associated with the different sectors mentioned in the Customer Satisfaction Survey to evaluate the use of the open-ended comments. The development of a C++ code was another method used to analyze the survey results; the code was designed to correlate postal zip codes with geographic sectors. The final phase of the

project will result in presenting visual and simple interpretation of the survey results. Overall, the analysis of the survey results was intended to help NWS strive to make the world a weather-ready nation!

Building a Robot for Surveillance

Nicholas Walker	Thomas Burch	Chutima Boonthum-Denecke
Hampton University	Hampton University	Hampton University
Department of Computer Science	Department of Computer Science	Department of Computer Science
Hampton, VA-23668	Hampton, VA-23668	Hampton, VA-23668
757-727-5552	757-727-5552	757-727-5082
nicholas.walker2@	thomas.burch@	chutima.boonthum@
my.hamptonu.edu	my.hamptonu.edu	hamptonu.edu

The purpose of this project was to design and construct an autonomous robot designed to perform a specific and helpful function. Our group settled upon a security robot designed to alert the owner of the house. As part of our proof of concept our robot will demonstrate several functions; the ability to monitor a set region, after detecting a presence it will move about the area "alerting" the police, and possessing a shutdown sequence requiring a touch input. To accomplish this, our group utilized the Handy Cricket™ motherboard to act as the control center for our robot.

Medicine Robot

Marcus Wells	Helena Bemberry	Chutima Boonthum-Denecke
Hampton University	Hampton University	Hampton University
Department of Computer Science	Department of Computer Science	Department of Computer Science
Hampton, VA-23668	Hampton, VA-23668	Hampton, VA-23668
757-727-5552	757-727-5552	757-727-5082
marcus.wells@	Helena.bemberry@	chutima.boonthum@
my.hamptonu.edu	my.hamptonu.edu	hamptonu.edu

The evolution of having robots to be able to do certain tasks has really grown over the past years. Robots are able to think of solutions to a problem within minutes, when the human mind can take days of planning and still don't have the problem solve as accurate as the robot. This concept allows the robot to be autonomous. Everyday doctors prescribe several prescriptions that require the medicines to be taken at different times by the patients. Older and younger age people tend to forget the appropriate time and often skipped to take the require dose. This Paper will demonstrate a Robot making autonomous decision to make sure patients are taking the right medication at the appropriate time.

Practical Investigations in Image Digital Forensics

Crystal R. Williams
Florida Agricultural and Mechanical University
Department of Computer and Information Sciences,
Tallahassee, FL 32307-5100
crystal_williams_famu07@yahoo.com

Doctored images, videos and audio are used to insert special objects into by copy-paste processing that conceals special objects from original images. In order to get secretive messages around it is extremely necessary to require some sort of *Morse* code for the receiver to reveal the hidden data [1]. Steganography is another term used to describe these activities and has been known for centuries being used in images, audio, text, video and protocols [2]. Image steganography however is the most popular cover object having so many file formats that consist of many different algorithms. Individuals tend to misconstrue steganography and cryptography when one keeps the contents of the message secret and steganography keeps the existence of the message unknown. Encrypted message are continuously sent to and from different governments and agencies but one question comes to mind. How are you certain that the media you receive has not been altered by a third party? Adobe Photoshop and many other software tools like it have made altering original images a flawless task. Surveys and methods have been studied states different steps that can be taken to determine whether the package has been tampered with. This project provides different surveys and methods that have been discovered to better dictate the integrity of images, videos and audio transported with encrypted messages. In addition, a summary and comparison among those methods will be given and recommendations for optimal methods for various images will be discussed.

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