

*The Symposium on Computing at
Minority Institutions
March 19-22, 2015, Atlanta, Georgia*

SECURING CYBERSPACE



The Association of Computer/Information Sciences and Engineering Departments at Minority Institutions
<http://www.admiusa.org/admi2015/>

WELCOME FROM THE PRESIDENT



I am pleased to welcome you to the Twentieth Annual Symposium of the Association of Computer Information Science and Engineering Departments at Minority Institutions (ADMI). The theme of this year's conference is *Securing Cyberspace*. We are extremely excited about this conference because we will host two student competitions: Cybersecurity Challenge and Computer Science Bowl.

For the next two days ADMI will continue our long tradition of showcasing faculty and student research. There will be multiple opportunities for networking, hands-on workshops, and special sessions. Again this year, we focus on graduate education by offering a Graduate School Recruitment Fair. Please refer to the Schedule at a Glance and take advantage of all of our intellectually stimulating activities.

The ADMI Board of Directors would like to thank our symposium sponsors and speakers for their generous support. We also extend a special thanks to the Symposium and Local Arrangements Committees for their untiring labor to make this conference a great success.

We hope you find this conference both interesting, motivating, and energizing and that you enjoy meeting up with old friends and making new contacts. We look forward to receiving your feedback on this conference and to seeing you again at ADMI 2016!

WELCOME TO ADMI 2015!

Thanks for joining us,
E. Rebecca Caldwell, Ph.D.



Thursday, March 19, 2015 – Georgia Tech Hotel and Conference Center

5:00-7:00 PM Board Meeting/Dinner

Friday, March 20, 2015 – Georgia Tech Hotel and Conference Center

7:30-8:15 AM Breakfast (Ballroom Break Station)

7:30 AM – 5 PM Registration (Salon 4-6 Foyer)

8:30-8:45 AM Welcome (Salon 4-6)

Dr. Rebecca Caldwell, ADMI President, Winston-Salem State University

Dr. Carmen Sidbury, Associate Provost for Research, Spelman College

8:45-9:30 AM

Keynote (Salon 4-6) - Caroline Jones, Department of Homeland Security (DHS)

9:30-10:30 AM

Faculty Session - Faculty Papers - Dr. Thorna Humphries (Conference A)

Analyzing Community Evolution in Complex Networks via Bio-inspired Computing

Hongmei Chi, Constance Dellor and Christy Chatmon

Development of a Website to Disseminate Mobile Forensic Laboratory Material

Doswell, Felicia

A Secure Cloud Tool for Communities of Practice to Share Best Practices

Nyagwencha, Justus, Cook, Tony, and Seals, Cheryl

Student Session – Internship Roundtable (TBA) - Maya Smith, Omar Owens, Joshua Young

10:30 – 10:45 AM

Break (Ballroom Break Station)

10:45 AM-12:30 PM

Faculty Session – Dr. Elva Jones, Winston-Salem State University (Conference A)

Fulbright Opportunities – Dr. John Trimble, Howard University

Student Session A – Graduate Education - Dr. Andrea Lawrence (Salon 4-6) - Dr. Cheryl Seals, Auburn University

Student Session B - SFS and Graduate Security Program – Dr. Thorna Humphries, Norfolk State University (Conference D)

Dr. Jonathan Graham, Norfolk State University, Dr. Chutima Boonthum-Denecke – Hampton University, Student Scholarship Recipients

12:30-2:00 PM

Luncheon - Welcome: Dr. Alfred Watkins (Salon 4-6)

Speaker – Mr. Reginald Gillins, Boeing

AWARDS: CReSIS Scholars - Dr. Linda Hayden

2:30 – 5:30 PM

Cybersecurity Competition - Mr. John Sands Moraine Community College (Conference A)

Computer Science Challenge – Dr. Rebecca Caldwell, Winston-Salem State University (Salon 4-6)

6:00 PM

Transport to Atlantic Station

6:30 – 9:00 PM

Activities at Atlantic Station

Saturday, March 21, 2015 – Georgia Tech Hotel and Conference Center

7:30 AM–12:00 PM 7:30 Registration (Salon 4-6 Foyer)

– 8:30 AM Breakfast (Ballroom Break Station)

8:30 – 10:30 AM

Faculty/Chair Summit – Dr. Jean Muhammad, Hampton University (Conference E)

Student Technical Workshop– Dr. Charles Hardnett, Spelman College (Conference B)

10:30 AM – 12:15 PM

Student Poster Session – Mr. Timothy Holston, Mississippi Valley State University (Conference A) Graduate Recruitment and Job Fair – Dr. Elva Jones, Winston-Salem State University

12:30 - 2:00 PM

Lunch (Dining)

2:00 – 2:45 PM

Faculty & Student Session – Dr. Linda Hayden, Elizabeth City State University (Salon 4-6)

Dr. Rich Loft, Science Gateways

3:00 – 4:30 PM

Student Papers – Dr. Thorna Humphries, Norfolk State University (Salon 4-6)

4:30 – 5:30 PM

Business Meeting (Salon 4-6)

6:30 – 8:00 PM

Awards Ceremony (Salon 4-6)

8:00 – 9:30 PM

Board Meeting (Conference 1)

ADMI Symposium Presenters



Caroline Jones

Program Management Analyst,
CyberSkills Management Support
Department of Homeland Security

Caroline Jones serves as the Outreach Program Manager for the Department of Homeland Security (DHS) CyberSkills Management Support Initiative. As Program Manager in support of the Executive Director, Ms. Jones manages the Cyberskills Management Support Initiative's cybersecurity-related outreach programs. In this role, she manages and maintains oversight on national cybersecurity-focused outreach events that have high focus on students ranging from middle school up to the college level. Ms. Jones initiates efforts to foster collaborative partnerships with academic institutions, providing two-year and four-year college students with opportunities to engage and network with some of the department's leading cybersecurity professionals.

Ms. Jones has over ten years of Information Technology (IT) and Project Risk Management experience serving as a Security and Management Analyst Practitioner in Civilian and Department of Defense environments. Prior to joining the Cyberskills Management Support Initiative, Ms. Jones served as an Information Technology Security Specialist in the department's Office of Intelligence and Analysis. In this role she formalized and developed the Office of Intelligence and Analysis first specialized training oversight compliance program for National Security Systems Information System Security Officers.

Before joining DHS, Ms. Jones was a Senior Security Analyst at the U.S. Department of Commerce International Trade Administration where she managed accreditation audits and developed strategic risk mitigation practices

to combat identifiable threats and vulnerabilities.

Previously, Ms. Jones held a position as a Public Affairs Specialist at the National Aeronautical Space Administration, NASA Goddard Space Flight Center and supported Get Away Special and Space Experiment Module (SEM) shuttle missions. In this position, Ms. Jones saw firsthand the enormous influence space technology played on influencing students to pursue technical careers.

Ms. Jones holds a Bachelor of Arts in English Literature from Hampton University and a Master of Arts in English Literature from Clark Atlanta University.



Reginald Gillins, Sr.

Reginald Gillins Sr. is an award-winning Versatile Technologist and Cryptographic Systems Analyst at The Boeing Company. He recently received the 2014 Black Engineer of the Year – Modern Day Technology Leader Award and the 2015 Black Engineer of the Year – Science Spectrum Trailblazer Award.

Between 1982 and 1996, Reginald led the technology implementation efforts for several companies in Los Angeles, including Warner Bros, Bank of America, Health-Net, and Litton (Northrop). In 1996, Gillins joined Boeing as an independent contractor implementing Computing Room Engineering Standards. Then as a programmer analyst, systems design specialist and systems administrator, Reginald took positions with successively more responsibility including operating test and development labs that integrate new technologies in the complex Information Security field.

While in Information Security, Reginald researched, developed and implemented one of the first comprehensive Disaster Recovery Plans for a critical IT security system in Boeing's IT Infrastructure. He also helped implement IT Security Operations for 787 Airplane maintenance systems, SecureBadge ISO/IEC 7816 standards, secure Voice-over IP network phones,

encrypted email, and systems providing Domain Controller Security Identification for every mainline Windows Server, desktop and laptop in the company. Reginald received numerous recognitions and awards for this work.

Gillins successfully designed and implemented the Boeing Recruiting Access and Network Database (BRAND) system, putting advanced technologies in the hands of Global Staffing personnel.

On his own time, Reginald investigated and published "Minority Inventors & Innovators, Our Nation's Unsung Pioneers" for members of the National Society of Black Engineers, the Boeing Black Employees Association, and the Society of Professional Engineering Employees in Aerospace (SPEEA). This material was further developed under the joint Boeing/SPEEA Ed Wells Partnership and offered as curriculum on the companywide Boeing Education Network. He is a graduate of Watterson Business College and the University of Washington, and currently is conducting graduate research at the University of Maryland University College in Digital Forensics and Cyber Security Investigations.



Dr. Jonathan Graham

Dr. Jonathan Graham received his Ph.D. in Computer Science from the University of Idaho in 2005. He has a Master’s degree in Computer Science from Jackson State University (1984) and a Bachelor’s degree in Mathematics and Computer Science from The University of the West Indies Cave Hill campus, Barbados. He is a Professor of Computer Science with 30 years of experience and serves as the director of the Norfolk State University Information Assurance Research and Development Institute (IA-REDI), a National Security Agency (NSA) and Department of Homeland Security (DHS) Center of Academic Excellence. Dr. Graham has served in this position since 2009.

Dr. Richard Loft of the National Center for Atmospheric Research, has worked in high performance computing since joining Thinking Machine Corporation in 1989, and has worked at the National Center for Atmospheric Research (NCAR) since 1994. At SC 2001 he was on a team that received a Gordon Bell prize honorable mention for developing a scalable atmospheric dynamical core called the High Order Method Modeling Environment (HOMME), which was recently integrated as part of the widely used Community Earth System Model. In 2005, he was NCAR PI on an NSF project to deploy and evaluate ultra-scalable models on an IBM Blue Gene/L system. Dr. Loft is currently Director of the Technology Development Division (TDD) in the Computational and Information Systems Laboratory (CISL) at NCAR. In this capacity, he oversees CISL’s R&D efforts, in areas such as applied computer science, visualization and enabling technologies, and earth system modeling infrastructure. He leads NCAR’s participation in NSF’s Extreme Science and Engineering Discovery Environment (XSEDE) program, the follow-on to the decade-long TeraGrid project. Recognizing the need to engage the next generation in high performance computing, in 2007 Dr. Loft created the Summer Internships in Parallel Computational Science program at NCAR, and is currently developing an HPC curriculum based on small, affordable Raspberry Pi clusters.



Dr. Richard Loft
Science Gateways, NCAR



Dr. John Sands

Dr. John Sands has been a professor of Information Technology at Moraine Valley Community College for 27 years. He also serves as the department chairperson for the Integrated Computer Technologies Department. John is the co-Principal Investigator of the Center for Systems Security and Information Assurance. He has his Ph.D. from Colorado State University School of Education and a MA from Governors State University. Dr. Sands has also been awarded several academic awards including Innovator of the Year and Master Teacher. Dr. Sands holds several industry certifications including CISSP, CCIA, CCNP, MCSE, and CCNA. He has also authored several textbooks, white papers and lab manuals and has been invited to speak at many national conferences. Dr. Sands has managed the creation and use of virtual teaching and learning environments to expand student experiential learning opportunities at a national level.

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 interest in programs that are community centered, increase diversity in technology, and targeted at helping today's youth strive for a better tomorrow. She continuously works with programs that provide computer interventions for students in the elementary, middle and high schools in the local area.



Dr. Cheryl Seals

ADMI Workshop Presenters



Charles Hardnett

Charles Hardnett is the Program Director for Computer Programming at Gwinnett Technical College. At GTC, he teaches courses in C++, Java, Python, Game Physics, Mobile Application Development, project management/software engineering, and various other computer programming topics. He is also an author of two books: “Programming Like a Pro for Teens”, which is a C++ programming book and “Virtual World Design for Teens”, which is a book about Alice programming. He also has a wide range of hobbies including dee-jaying and distance running. He resides in Rockdale County east of Atlanta with his wife, Felicia, and his two children, Erin and CJ.



Dr. John Trimble

Dr. John Trimble is currently serving as a Fulbright professor at Tshwane University of Technology’s Industrial Engineering Department. This is his second appointment as a Fulbright professor. He served as a Fulbright professor at the National University of Science and Technology (NUST) in Zimbabwe from 2003-2004. He holds a BSc in Engineering from Northwestern University, MSC in Computer Science from Stanford University, MSc in Operations Research from UC Berkeley and a PhD in Industrial and systems engineering from Georgia Tech. Trimble has over 25 years of teaching experience at various universities in the USA, Zimbabwe, Rwanda and South Africa. He has served as Head of Department at Morris Brown College and Dean of ICT at Umutara Polytechnic University. Prior to joining the academy, Trimble worked in industry as a researcher, software developer and manager. Over the past 15 years, Trimble has been heavily involved with research and projects concerning the use of ‘appropriate technology. He has led in the

organizing of 6 international conferences on appropriate technology, held across Africa in Zimbabwe, Rwanda, Ghana, South Africa and Kenya. For the past two years, Trimble has worked closely with the African Journal of Science, Technology, Innovation and Development (AJSTID) serving as co-editor of a special issue of appropriate technology.

Undergraduate Papers

	Author	Title	Institution
1	Tayla S. Frizell	Enhancing Parent Involvement in NC-CCSS for K-2 Mathematics	Mississippi Valley State University
2	Maya Smith	Isotopic Signatures of Rain and Snow in the Juneau Icefield Snowpack	Winston-Salem State University
3	Jameelah M. Young	Psychoacoustic Oriented Therapy: A Computational Approach	Hampton University

Graduate Papers

	Author	Title	Institution
1	Yohannes Alemu	Practical investigation of anomaly detection in wireless BAN	Florida A& M University
2	Gina Bullock	A Multiagent and Workflow System for Structural Health Monitoring	North Carolina A & T State University
3	Claude Concolato	Comparing Meta-Data Formats for Web-Based Image Retrieval	The University of District of Columbia
4	Blaize K. Srothers	Health Care Laws and Cyberspace: Examining Cyber Threats to HIPAA	Hampton University

Undergraduate Student Posters

	Author	Title	Institution
1	Danielle Butts	PatientConnect: A Doctor to Patient Communication Application	Norfolk State University
2	Jamekka Chambers, Brian Cedillo	The Robot as a Medical Assistant	Winston-Salem State University
3	Ricky Dixon	The Impacts of Seasonal Flooding on the Mississippi Delta and Future Adaptation Management Planning	Mississippi Valley State University
4	Tayla S. Frizell, Nyjah Grant, Deanna Mallard	Enhancing Parent Involvement in NC-CCSS for K-3 Mathematics	Mississippi Valley State University Longwood University
5	Keythe Gentry	Creation of a Donation Drop Box Locator Application Using Google Maps API	Morehouse College
6	Precious Gibson	Development of a Microcontroller Interface for a Physical Circuit of a Neuron	Spelman College
7	Tony Gibbs	Using Robotics to Improve Student Satisfaction and Engagement in an Introductory Computer Programming Course	Winston-Salem State University
8	Troy Hill	Teaching Programming with GameMaker Drag-and-Drop and Arduino Text-Based Code	Winston-Salem State University
9	Jerron Jamerson	Secured by yourself: The Impact Biometrics on Information Security	Winston-Salem State University
10	Sean Jenkins	ISAC	Tennessee State University
11	Britney L. Johnson	Development of System Maturation Team(SMT) Capability Roadmap Diagrams Using Milestones Software	Hampton University
12	Jazette Johnson	BEDXPLOER: Development of a Gyroscope Controlled Vehicle to Decrease anxiety and Fears of Bedridden and Hospitalized Children	Spelman College

13	Kalyx McDonald	Using a MATLAB/Photoshop Interface to Enhance Image Processing in the Interpretation of Radar Imagery	Mississippi Valley State University
14	Omar Owens, Anthony Scott	Satellite Imagery along the George VI Ice Shelf, Antarctica	Winston-Salem State University
15	Joshua C. Posey	Sentiment Analysis and Visualization of Free-Response Survey Data.	Morehouse College
16	Jamal Stevenson, Raveen McKenzie	A Comparative Study to the 2011/2013 Water Quality Assessments in the Pasquotank Watershed in Northeastern North Carolina with a Sea Level Rise Component	Mississippi Valley State University
17	Marcellus Williams	Cyber Security in the Military	Hampton University
18	Josh Young , Jazmyn Saunders	Military Robots	Winston-Salem State University
19	Michael A. Young, LeTasha C.McFarlane, LaVonne Manning	Analysis of Images to Aid in Human-Computer Interactions through Segmentation and Gesture Recognition	University of the District of Columbia

Graduate Student Posters

No.	Author	Title	Institution
1	Yohannes Alemu, Hongmei Chi	A Practical Investigation of Anomaly Detection in Wireless Ban	Florida A&M University
2	Kimberly Gold	A TestBed for Modeling and Detecting Attacks on NFC Enabled Phones	Tennessee State University
3	Dominique Hubbard	A Practical Investigation of Culturally Sensitive Factors in Health	Florida A&M University
4	Shaquille Michael	Development of Collision Detection for Cyclic Coordinate Descent Algorithm	Tennessee State University
5	Kaila Perry	Using Apache SOLR to Manage Log Files	Norfolk State University
6	Charles Scott, Walid Younes	Simulating Realistic Web Traffic Using NS-3	Hampton University, Lawrence Livermore National Lab

Symposium Presentation Abstracts

Title: Using Low Cost Clusters to Teach High Performance Computing Concepts

Presenter: Dr. Richard D. Loft

Co-Author: Raghu Raj Prasanna Kumar

Abstract

Last summer our team at the National Center for Atmospheric Research (NCAR) used teaching clusters composed of four low-cost Raspberry-Pi computers – mini supercomputers really – to successfully conduct two research projects with undergraduate students. Developed as a “spin-off” of the long-standing Summer Internships in Parallel Computational

Science (SIParCS) program within the Computational and Information Systems Laboratory (CISL) at NCAR, the students from Minority Serving Institutions (MSI's) did 11-week projects that culminated in local seminars and professional posters presented at a regional Rock Mountain Advanced Computing Consortium (RMAACC) High-Performance Computing (HPC) Symposium. This year we are expanding this program to four projects with a total of five students, three of whom are from MSIs.

In addition, we have written an internal proposal to further expand this program to include a new element we call *Pi in the Sky (PintS)* that elicits, funds and supports co-designed college student projects in the HPC and data-centric computational sciences. PintS is aimed at two specific populations that are currently underserved by both the national scientific computing and STEM communities, namely nontraditional and underrepresented students. The goal of PintS is to demolish many of the cost, resource, and mentorship barriers that currently stand in the way of engaging and teaching valuable high-end computing and big data analytics skills, opening a pathway for students to go on to become professionals in fields where demand for qualified students is expected to grow by 85-95% in 2015 alone. In both the SIParCS and PintS programs we plan to expand the target platforms beyond Raspberry-Pi to also include small clusters composed of Jetson TK1 systems for parallel GPU programming. We plan to fund approximately 15 PintS student projects over the next two fiscal years. Key deliverables of all of these projects will be: 1) awareness of and access to HPC career paths; 2) quality project results that can be presented at professional conferences; and 3) sharable project directions that can be replicated and built upon by other students (and faculty) through our blog site <http://ucar.github.io/r-pi/#benchmarking>.

Title: Eureka! A Game Engine for CS Education

Presenter: Charles Hardnett

Description:

This workshop will introduce participants to the Eureka game engine that is designed for use in game design and game physics courses. This game engine is to address the gap that is made by having students build everything from scratch and commercial products such as Unity and Unreal that provide too much functionality. Building a game engine infrastructure from scratch is both time-consuming and error-prone. On the end of the spectrum, commercial products provide functionality such as collision detection and game physics to aid professional developers, but this makes it difficult for students to learn from building this functionality. Eureka provides basic game engine features such as a regulated game loop, mouse and keyboard input processing, basic image processing for 2D sprites, and fundamental sound effects processing. Eureka allows students to focus on developing content that is directly related to their game design and game physics courses. Eureka has an extendable OO structure written in Java. Eureka is distributed as a JAR file that can be imported into any Java project.

System Requirements

- Current Java JDK installation
- Netbeans IDE with Java SE support
- Windows, Mac OS X, or Linux

Faculty Paper Abstracts

Analyzing Community Evolution in Complex Networks via Bio-inspired Computing

Hongmei Chi and Constance Dellar
Florida A&M University
1333 Wahnish Way
Tallahassee, FL 32307-5100

Christy Chatmon
Florida State University
Tallahassee, FL

Detecting community structure in complex networks is a fundamental but challenging topic in network science. While many researchers still continue and unfold into the applications of the various community detection techniques and methods, it is becoming important to detect more specific communities in complex networks. This paper attempts to set up a framework through a practical study that implements community detection algorithms by employing bio-inspired computing techniques such as the differential evolution to detect more specific networks in complex networks. A multistep approach is adapted in the implementation of this framework to address the modularity limit problem which causes some smaller communities not be detected independently. A modified blended algorithm is proposed for specific datasets. In addition, the documented real world networks are being adopted as a test-bed for our study. The proposed algorithm detects more communities while maintaining a comparatively high modularity measure which indicates the strength of the communities detected.

+++++

Development of a Website to Disseminate Mobile Forensic Laboratory Material

Felicia Doswell
Norfolk State University
700 Park Avenue
Norfolk, Virginia 23504
0-757-823-9453

Terrence Pugh
Norfolk State University
700 Park Avenue
Norfolk, VA 23504

There is an abundance of digital forensic tools used in practice by professionals in the industry. These tools are expensive for the average person seeking to experiment with such tools. Open source digital forensics have emerged to assist with this concern, but many of the tools are difficult to use, experimental, and not vetted for accuracy. Furthermore, they do not provide adequate documentation to assist beginners with learning how to use the tools resulting in trial-and-error usage of the tools. The digital forensics community will benefit from research that addresses the lack of availability of affordable digital forensic training material by increasing the quantity of endorsed educational tools for learning digital forensics. This research effort presents the development of a website to disseminate vetted mobile forensic laboratory material for the average person interested in exploring the area of mobile forensics. The features of the website are presented.

+++++

A Secure Cloud Tool for Communities of Practice to Share Best Practices

Justus N. Nyagwencha
Hampton University
100 Queen Street
Hampton, VA 23668
3343245595
Auburn, Alabama 36832

Tony Cook
Auburn University
Auburn, Alabama 36832

Cheryl D. Seals
Auburn University

The research paper reports a computational framework. (Universal Quadrant Model (UQM)) that enhances cloud security within a community of practice. The proposed model aids in assigning members to various groups during registration and issues alerts to administrators to elect leaders to moderate discussions among members spread out across a region within the learning environment (cloud). However, it is public knowledge that virtual anonymity is a complex and challenging problem without a perfect solution; but we believe it can be partially solved by a model that associates creating, moderating and managing groups and its members to a spatial locality based on a backtracking algorithm. The paper also demonstrates that the UQM model significantly improves on the current ad hoc model which involves listing/creating regions based on the political boundaries and alignments i.e. the state of Alabama which is our test bed. In addition, it addresses the membership anonymity problem by associating them with self-reported spatial locality groups during registration and automates perpetuation of new manageable groups. The newly generated groups in UQM have a child-parent relationship and are duplicated on strength (size of the group exceeding P) with weak groups dying off replicating genetic algorithms.

Graduate Paper Abstracts

Practical investigation of anomaly detection in wireless BAN

Yohannes Alemu
Florida A&M University
Department of Computer and Information Sciences
Tallahassee, FL 32307-5100
(850) 980-2558
yohannes1.alemu@famuedu

Hongmei Chi
Florida A&M University
Department of Computer and Information Sciences
Tallahassee, FL 32307-5100
(850) 412-7355

This study is a practical investigation via modifying the anomaly detection algorithm in wireless sensors BAN proposed by [2] for the reduction of false alarm. The investigation is made based on a modified version of the DWT and the Hampel filter by introducing KDE to compensate its limitation Hampel filter for spatial analysis and then apply the Boxfilter for temporal analysis. The study uses the patients' medical records from the multi-parameter intelligent monitoring in intensive care (MIMIC) database of Physionet [3].

+++++

A Multiagent and Workflow System for Structural Health Monitoring

Gina Bullock
Dept. of Computational Sci. & Eng.
North Carolina A&T State University
Greensboro, NC 27411
1-336-334-7717
gbulloc@ncat.edu

William Nick
Dept. of Computer Science
North Carolina A&T State University
Greensboro, NC 27411
1-336-334-7245
wmnick@aggies.ncat.edu

This student paper reports on work on structural health monitoring done for NASA at North Carolina A&T State University. We are developing a system where a hierarchically structured collection of monitor agents monitors the health of a structure by interpreting acoustic signals. A monitor agent at the lowest level in the hierarchy is associated with a wireless mote that transmits data from an acoustic sensor. It negotiates with specialized agents to find techniques for extracting feature vectors from signal samples and classifying events associated with signals. A monitor agent higher in the hierarchy tracks the results produced by the monitor agents below it, interpreting the state of the structure covered by the sensors associated with its descendant agents. The hierarchy reconfigures dynamically, and problem solving follows the structure of the hierarchy in opportunistic ways. Agents here typically serve as proxies for techniques with intensive communication and computation requirements. Agents negotiate to determine a constellation of techniques for solving the task at hand and communicate it to a workflow engine, which actually carries out the tasks.

The faculty advisor for the work reported here is Dr. Albert Esterline, Dept. of Computer Science, North Carolina A&T State University, esterlin@ncat.edu.

+++++

Comparing Meta-Data Formats for Web-Based Image Retrieval

Claude Concolato
Department of Computer Science and Information Technology
University of the District of Columbia
Washington, DC, USA
claude.concolato@udc.edu

This research compares three different known data formats, CSV, XML and JSON for web-based data retrieval. We created a lengthy set of image data files with the three different formats of meta data. We also designed and implemented a software prototype that conducts a search for images on the dataset. Experiments were conducted on the three different sets of meta data, and the execution speed results were compared. It was concluded that CSVs are the most efficient data format for large data sets like that of web-based image processing, network logs for intrusion detection and other forms

analytic web applications provided that the data can be mapped in a tabular fashion. If non-tabular data is required, JSON proved the most efficient when compared to XML.

+++++

Health Care Laws and Cyberspace: Examining Cyber Threats to HIPAA

Blaize K. Strothers
Department of Computer Science
Hampton University
Hampton, VA, USA 23668
blaize.strothers@gmail.com

This paper describes cyber security challenges facing Health Insurance Portability and Accountability Act (HIPAA) health information regulation and calls for its modernization in order to combat cyber threats posed by medical cyber attack, the theft and sale of medical records, and the hacking of medical devices and equipment.

+++++

Undergraduate Student Paper Abstracts

Enhancing Parent Involvement in NC-CCSS for K-2 Mathematics

Tayla S. Frizell Mississippi Valley State University Itta Bena, Mississippi
Dr. Linda B. Hayden Principal Investigator Elizabeth City State University 1704 Weeksville Road, CB 672
Dr. Darnell Johnson Elizabeth City State University 1704 Weeksville Road, CB 672
Dr. Ervin Howard Elizabeth City State University 1704 Weeksville Road, CB 672 howardem40@gmail.com
Nyah G. Grant Longwood University Farmville, Virginia
Deanna C. Mallard Mississippi Valley State University Itta Bena, Mississippi deanna.mallard@mvsu.edu

In this study, the 2014 REU math team developed and provided a workshop that assisted parents in understanding the North Carolina Common Core State Standards for K-2 Mathematics to assist with student homework assignments. Parent involvement is defined as parent participating in the educational processes and experiences of their children. A chi-square analysis was used to analyze data collected from the pre survey and the post survey administered to participants in the workshop. The study revealed all of the individual components of parent involvement were positively and significantly related to educational goals. The study identified various aspects of parent involvement that yielded statistically significant results in affirming that parent involvement attributed to urban student achievement. These findings were particularly helpful for indicating which kinds of parent involvement influenced academic success. Most notably, parent expectations and styles demonstrated a strong relationship with scholastic outcomes. Parent expectations and styles created an educationally oriented ambience that established an understanding of the certain level of support the child needed to succeed academically. The REU mathematics team focused on three essential questions in this study: (1) What practices will increase parent awareness of K-2 NC-CCSS for mathematics at P. W. Moore Elementary School? (2) What methods can be used to strengthen parent skills in assisting with mathematics homework assignments at P. W. Moore Elementary School? (3) What actions can be taken to motivate parent involvement in the school improvement process focusing on mathematics at P. W. Moore Elementary School?

+++++

Isotopic Signatures of Rain and Snow in the Juneau Icefield Snowpack

Kelly Hughes¹, Tristan Amaral², Natalie Raia³, Erik Tamre⁴, and Maya Smith⁵

¹Department of Geology, Portland State University

²Department of Earth Sciences, University of New Hampshire

³Department of Geological Sciences, University of Texas at Austin

⁴Department of Earth and Planetary Sciences, Harvard University

Climatic shifts in southeast Alaska are likely to result in changing weather patterns across the Juneau Icefield. Glaciers in this region will be threatened by an increase in temperature and frequency of rain events during the accumulation season, undergoing changes that vary based on their elevation and distance from the coast. Rain and snow events affect the glacier snowpack differently, but the possible influence of a changing rain-to-snow ratio has not been investigated on the Juneau Icefield. However, recent mass balance deficits have drawn attention to the importance of changing weather conditions in southeast Alaska. In this study, we will use stable water isotopes ($\delta^{18}\text{O}$ and δD) to trace the deposition and modification of precipitation during its lifetime in the annual snowpack on the Juneau Icefield. Ice lenses in snow pits dug for mass balance estimates have already been constrained as either resulting from rain events or melt-refreeze cycles, but isotopic analysis of water from these layers provides the high-precision method necessary to determine the relative contribution of each formation process. In addition to comprehension of physical processes occurring within the snowpack in response to different precipitation events, the data collected during this trans-icefield study will contribute to the understanding of trends in isotopic fractionation of precipitation across geographical gradients.

+++++

Computer-Aided Psychoacoustic Oriented Therapy

Jameelah M. Young
Hampton University, 100 E Queen St, Hampton, VA, 23668
jyoung@live.com

“Music is the movement of sound to reach the soul for the education of its virtue.” - Plato

Psychoacoustics is an interdisciplinary field that studies human responses to sounds. This has been observed throughout the ages and is now an emerging professional field with many applications. One increasingly prevalent practice of this study is the use of music therapy. It is believed that sound has the ability to effectively heal people physically, emotionally and socially. With the aid of computer resources, there lies the opportunity for the development of systems that would contribute to this form of therapy.

ADMI Board

Rebecca Caldwell - ADMI President

Department of Computer Science
Winston Salem State University
calwelle@wssu.edu

Alfred Watkins - ADMI Vice-President for Information

Department of Computer Science
Spelman College
alwatkins@spelman.edu

Andrea Lawrence - ADMI Treasurer

Department of Computer Science
Spelman College
Lawrence@spelman.edu

Constance G. Bland

Department of Mathematics & Computer Science
Mississippi Valley State University
cgbland@mvsu.edu

William Lupton

Department of Computer Science
Morgan State University
william.lupton@morgan.edu

Jean Muhammad

Department of Computer Science
Hampton University
jeana.muhammad@hamptonu.edu

Robert A. Willis Jr.

[Ex-Officio ADMI President, Member at Large]

Department of Computer Science
Hampton University
robert.willis@hamptonu.edu

Forbes D. Lewis (Ex-Officio)

IEEE Representative

[University of Kentucky - Retired]
Department of Computer Science
lewisfd@hotmail.com

Linda Hayden - ADMI Vice-President for Programs

Math & Computer Science Department
Elizabeth City State University
haydenl@mindspring.com

Thorna Humphries - ADMI Secretary

Department of Computer Science
Norfolk State University
thumphries@nsu.edu

Elva Jones

Computer Science Department
Winston Salem State University
jonese@wssu.edu

John Trimble

Department of Computer Science
Howard University
trimble@scs.howard.edu

Loretta A. Moore

Computer Science Department
Jackson State University
loretta.a.moore@jsums.edu

Andrea Lawrence

[Ex-Officio ADMI President]

Department of Computer Science
Spelman College
lawrence@spelman.edu

Vivian J. Fielder (Ex-Officio)

[Fisk University -Retired]
vfielder@bellsouth.net

Lawrence Oliver (Ex-Officio)

[ADMI Executive Director]

[Formerly at the NSF]

Ramon Vasquez-Espinosa

[Ex-Officio]

Dean, College of Engineering
University of Puerto Rico - Mayagüez

Special Thanks to Our ADMI 2015 Sponsors



