URE

ELIZABETH CITY STATE UNIVERSITY

UNDERGRADUATE RESEARCH EXPERIENCE

CENTER OF EXCELLENCE IN REMOTE SENSING EDUCATION AND RESEARCH

Summer 2007 Research Abstracts
2007-2008 Program Highlights

Karitsa Williams - Graduate, Computer Science
Mentor: Dr. Andrew Shepherd
Internship: CReSIS International Research Experience Program - University of Edinburgh
Title: Estimating the Average Rate of Volume Change (dv/dt) of Jakobshavn Isbrae to Determine Spatial Patterns of Ice Loss

Recent studies involving the Greenland Ice Sheet (GrIS) have shown increased coastal thinning, based on repeated airborne laser-altimeter surveys (Krabil et al., 2000; Krabil et all., 2004). Altogether, these surveys have shown that the average ice loss from Greenland was 80 ±12 km3 yr-1, between 1997 and 2003 and that thinning rates averaged ~10m yr-1 at many glacier termini. The Jakobshavn Isbrae is considered the fastest moving glacier in Greenland, and in this study we identify "thinning regions" within 250 km radius of its terminus. We use Envisat radar altimeter data recorded during the period 2002-2005 to form time series of elevation change at locations across the downstream section of the glacier. From this data, we calculate rates of elevation change (dh/dt) and their associated uncertainty at each of these locations. We estimate the average rate of volume change (dv/dt) of the glacier throughout the survey period, and we analyze the data to determine spatial patterns of ice loss across the Jakobshavn Isbrae.

Tiwana Walton - Sophomore, Computer Science
Mentor: Dr. Shah Keshmiri
Internship: Center for Remote Sensing of Ice Sheets (CReSIS), University of Kansas
Title: Unmanned Aerial Vehicle Mission Planning to Kangerlussuaq, Greenland

The Center for Remote Sensing of Ice Sheets (CReSIS) is developing an Uncrewed Aerial Vehicle (UAV) for application as a sensor platform in Polar Regions. Existing certification and flight regulations in Greenland do not adequately address the aircraft's larger size, nor have vehicles of this type been previously operated in the area. This paper will address some of the preliminary efforts undertaken to coordinate and fly the Meridian UAV in Greenland, beginning in 2008.

Unquiea Wade - Junior, Computer Science
Mentor: Dr. Arvin Agah
Internship: Center for Remote Sensing of Ice Sheets (CReSIS), University of Kansas
Title: Investigation of Power Sources for the Polar Seismic TETwalker

The TETwalker robot was created by NASA Goddard Space Flight Center for space exploration. The goal for this project was to merge the TETwalker platform and technology with seismic surveying to acquire polar seismic data in an innovative fashion. The first objective of this project was to identify reliable power sources for a swarm of TETwalkers. By integrating multiple power sources like solar, wind, and vibration with the TETwalker design, this would make an excellent polar seismic data acquisition robot. The second objective was to adjust the design to accommodate the necessary power sources, along with their size and weight requirements.

Bryce Carmichael - Junior, Computer Science
Mentor: Dr. Arvin Agah
Internship: Center for Remote Sensing of Ice Sheets (CReSIS), University of Kansas
Title: Modeling and Simulation for the Polar Seismic TETwalker

The objective of this project was to adapt the design of a robot that was originally created at NASA Goddard Space Flight Center called the TETwalker, in a computer simulation software program to demonstrate the collection of seismic data of ice sheets in Antarctica and Greenland. We will take their design and adapt it for seismic data collection by placing seismic sensors (geophones) in each ground node of the tetrahedral structure, or in the center node for deployment. Seismic methods are analyzed in order to determine which design could possibly be more efficient and reliable in polar environments in terms of geophone deployment and environmental characteristics.

Illiana Thomas - Sophomore, Mathematics
Mentor: Mr. Je'aime Powell
Internship: Elizabeth City State University - CERSER
Title: Creation of a Flexible and Scalable Distributed Computing Infrastructure Using OpenGRID Project Standards

The focus of the TeraGRID team was to setup a documentation platform for a Condor-based GRID to be established at ECSU. This documentation platform was a Linux based web sever that utilized Web 2.0 standards to create a virtual documentation web portal. Grid computing is the creation of a "virtual supercomputer" by using a network of geographically dispersed computers. In order to create such a network infrastructure, documentation is critical to communicate with the users, and the maintainers of the systems.

The web server created utilized an Ubuntu Linux kernel with an Apache web server, a MySQL Database, a PHP scripting package, and a Media Wiki web interface. This particular setup is called a LAMP server. LAMP is the acronym for Linux, Apache, MySQL, and PHP which are all open source applications.

Currently installed, the documentation server is now able to utilize, and first display the information on how to re-create a document server. The documentation server is being used to document how to setup a Condor-based GRID system.

Amber Smith - Sophomore, NC A&T
Mentor: Dr. Kees van der Veen
Internship: Center for Remote Sensing of Ice Sheets (CReSIS), University of Kansas
Title: Sub-Glacial Topography and Ice Discharge of the Greenland Ice Sheet

The topography of the majority of Greenland was unknown, due to the ice sheet that covers all but the coastlines, until Jonathan Bamber created a map of the bed topography in 2001. By using the map, he was able to determine that bed topography does effect the movement of the ice sheet, but the map did not take into consideration narrow sub-glacial valleys, according to Dr. Kees van der Veen from the University of Kansas. For this project, radar images of Greenland taken by the University of Kansas from 1993 until 2003 were reanalyzed to locate the more narrow valleys. Initial analysis of the bed profiles suggested many of the major drainage routes in the Greenland Ice Sheet were associated with sub-glacial valleys. After identifying what were thought to be the location of the narrow trenches, a comparison with measured surface velocities was made to evaluate whether minor bed topography affects the location and onset of fast glacier flow.

TreAsia Fields - Junior, Math
Mentor: Dollie M. McCown
Internship: NASA Langley Aeronautics Research Summer Scholar
Title: Inspire the Next Generation of Explorers

This summer, as a Langley Aeronautics Research Summer Scholar (LARSS), I was given the assignment of setting up outreach programs in the community where I would present National Aeronautics Space Administration (NASA) information and opportunities.

The most rewarding method of reaching out to the community was through setting up site visitations and presenting NASA information. A point of contact was made to all site supervisors and staff members of different community centers and summer camp programs to arrange a time to come out and present the NASA information to the summer camp students and staff. After doing so, there were meetings held with my supervisor, Dollie M. McCown and Aerospace Education Specialists Rudo Kashiri and Dynae Fullwood to analyze beneficial activities to implement during the presentations.

The overall outcome of this project was that information about NASA was presented to the community in a way that they would want to engage in NASA activities and become a part of the NASA team. All of the students that were a part of the informal outreach programs really enjoyed themselves and left with a broader mindset about NASA.

Ryan Tubbs - Sophomore, Jarvis Christian College
Mentor: Dr. R. D. Hale
Internship: Center for Remote Sensing of Ice Sheets (CReSIS), University of Kansas
Title: Hardware Modeling and Machining for UAV-Based Wideband Radar

The Center for Remote Sensing of Ice Sheets (CReSIS) at the University of Kansas is currently implementing wideband radar systems and other sensors that can obtain ice profiling data from Polar Regions using airborne platforms. In particular a 180-220 MHz radar is being developed to operate on the Unmanned Aerial Vehicle (UAV). The UAV has been given the name "Meridian." The radar system is constrained to be accommodated in a volume of 20in. x 20in. x 10in. with a weight limit of 55kg. In order to optimize the usage of the space, it is critical to use computer aided design CAD tools to perform accurate 3-dimensional modeling of the radar system. This paper presents different models developed in AutoCAD Inventor which allow visualizing all space aspects of the design, while reducing the design cycle. The parts presented here correspond mainly to the digital sub-system of the radar. Full drawings are provided along with a description of the system components modeled.

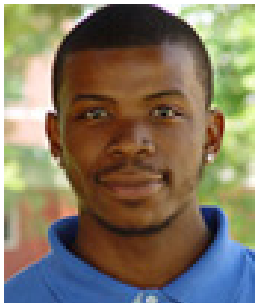
Jasmin Rivers - Sophomore, Computer Science
Mentors: Dr. A. Agah, KU/CReSIS, Mr. T. Majithia, ECSU
Internship: Undergraduate Research Experience in Ocean and Marine Science/Cyberinfrastructure 2007
Title: Use of Microsoft Visual Studio and DirectX SDK to Simulate Movements of a Colony of Penguins that must be tagged for a Science Mission Education

Our team worked on the development of an educational video game targeting middle school students to introduce them to research at the Polar Regions. We enhanced an existing video game, improving the visual quality of the game, and incorporated biologically inspired aspects into the game play. The game consists of a colony of penguins that must be tagged for a science mission in order for the scientist to track the penguins' movements throughout the year. The penguins move around to avoid being tagged (walk, run, and, slide) and hide behind snow mounds or other obstacles.

In developing this game, we were involved in specifying, designing, implementing, and testing the software for the game. The platforms and packages that were utilized included Visual C++ Express Edition and Microsoft Platform SDK. We generated enhanced images for penguins and other objects in the game. We researched the behavior of penguins in order to make the game more realistic, such as studying the walking and running speeds of penguins. The game play was also improved based on the results of testing performed using human subjects, incorporating the feedback from the players. Being involved in developing this game has improved our programming and software engineering skills, while resulting in an entertaining educational resource for middle school students in order to get them interested in STEM disciplines.

Supercomputing 2007 - Reno, Nevada
ECSU Representatives Mrs. Sharonda Walton, Dr. Linda Hayden, and Mr. Anthony Adade are shown with Indiana University representatives at SC07.

Akeem Archer - Junior, Computer Science
Lee Smalls, Jr. - Junior, Computer Science
Mentor: Mr. Joseph Ausby
Internship: Undergraduate Research Experience in Ocean and Marine Science/Cyberinfrastructure 2007
Title: GIS Dynamic Web Application Development



Recently, the City of Elizabeth City established its own Geographic Information System (GIS) Division. This division is responsible for managing the City's geospatial data sources and providing that data content citywide. The goal of the City is to use the completed asset mapping data to conduct studies that will improve the existing utility infrastructure to meet future growth of the City.

The project examined the efficiency and methodology of the Elizabeth City Geographical Information Systems Services and its ability to disseminate its geographical data to various City departments. The goal of this study was to develop a web-based application that would allow designated users to access the Geographical Information Systems data within the Public Works intranet and later provide this data to the public via the internet.

The GIS Web Application Development Team was able to modernize the ability of the GIS Services to deploy its geospatial data in a method that proves efficient, consistent and highly available to its users. This project will coincide with the City's utility asset mapping program and will serve as the basis for additional web development.

Kaiem Frink - Senior, Computer Science
Mentors: Dr. Jennifer Foster, Dr. Randy Weinberg, Dr. Larry Heimann
Internship: Carnegie Mellon University - Information Systems in the Community
Title: Carnegie Mellon University PHP and MySQL Development for Non-Profit Organizations

The 2007 Carnegie Mellon University Information Systems A-Team developed corporate nonprofit online websites for Local Pittsburgh Non-Profit Organizations. The A-Team utilized Macromedia Dreamweaver in conjunction with an Apache server to collaborate with Microsoft Access for Database functionality as a daily system backup. The Team utilized PHP and MySql for the systems online Apache database functionality. In addition to Java, Perl and Ruby was utilized for scripting purpose to secure and maintain system integrity.

ELIZABETH CITY STATE UNIVERSITY

SEVENTH BIENNIAL AWARDS BANQUET

The Seventh Biennial Awards Banquet organized by the Office of Sponsored Programs, Contracts & Grants was held on March 27th, 2008 for the Elizabeth City State University (ECSU) faculty and staff.

The bi-annual event spotlights outstanding efforts by the faculty to bring grants and sponsorships to the university. The awards banquet is held every two years to give new and developing grant writers an opportunity to hone their grant writing skills and to become eligible for next awards banquet in 2010.

Dr. Linda Hayden received the Chancellor's Award, the largest dollar amount of proposals submitted, and the largest number of awards funded. The School of Math, Science and Technology received the Vice Chancellor's Award which was accepted by Dr. Cynthia Warrick, Dean of the school of Math, Science and Technology. Dr. Jinchun Yuan, CERSER Director of Research, received 2nd place in Largest Dollar Amount of Proposals Submitted.

ECSU Chancellor Willie Gilchrist and Dr. Darnell Johnson, Chair of the Math & Computer Science Department during the the Awards Banquet at the K. E. White Graduate Center.

CENTER OF EXCELLENCE IN REMOTE SENSING EDUCATION AND RESEARCH - ELIZABETH CITY STATE UNIVERSITY

INTERNSHIP ROUNDTABLE 2007

Tuesday, November 6, 2007

The Undergraduate Research Experience Program at Elizabeth City State University hosted the 2007 Internship Roundtable on November 6 in Dixon Hall. The Internship Roundtable is a venue by which students who have interned during the summer of 2007 can share their experiences, both good and bad, with those seeking internshipd for the upcoming year.These internships ranged from traditional research activities to business oriented internships. Presenting this year were Cheniece Arthur, Bryce Carmichael, Tiwana Walton, Unquiea Wade, Rosalind Ervin, and Kaiem Frink.

Other students presented new research experiences to the table for the summer of 2008. These included the where, when, and how's of applying for internships and the requirements needed to apply. Ms. Roberta Shaw, of ECSU Career Services, also spoke on the opportunities and resources provided by her office. She opened the door for students to seek information from their office on upcoming internships from throughout the country.

HONORS CONVOCATION AWARDS

Center of Excellence in Remote Sensing Education and Research (CERSER)

CERSER "Research Program" Award
Criteria: Second Semester freshman or above, 3.0 current or cumulative GPA, attending research training seminars
Award: Certificate/$150.00
Recipients: Vernon Brown :: Wanda-Marie Carey :: Justin Deloatch :: Chelsea Goins :: Michael Jefferson, Jr. :: MyAsia Reid :: Raymond Thrower :: Chelsea Vick

CERSER "Research Scholars" Award
Criteria: Sophomore or above, 3.0 current and cumulative GPA, attending research training seminars, completed at least one approved internship
Award: Certificate/$250.00
Recipients: Jamika Baltrop :: Bryce Carmichael :: TreAsia Fields :: Spencer Weeks-Jamieson :: Lee Smalls, Jr. :: Illiana Thomas :: Tiwana Walton :: Unquiea Wade

CERSER "Award of Excellence"
Criteria: Graduating Senior, 3.0 Current or cumulative GPA, attending research training seminars, admission into graduate school with financial support, completed at least two approved internships
Award: Certificate/$1000.00
Recipients: Brian Campbell, Kaiem Frink

Representatives from Elizabeth City State University recently traveled to North Carolina State University (NCSU) for the Infinite Possibilities Conference (IPC) national conference. This conference was hosted by Building Diversity in Science (BDIS), North Carolina State University (NCSU), and The Statistical and Applied Mathematical Sciences Institute (SAMSI) in Raleigh, North Carolina.

Distinguished Lecture Series

Spring 2008-Dr. Richard K. Moore

Front Row: Dr. Andrea Lawrence (Spelman College), Dr. Malcolm LeCompte, Dr. Moore, Mr. Charles Luther, Dr. Linda Hayden
Also Pictured: Dr. Minjun Wang, Dr. Jinchun Yuan, Dr. Bill Porter

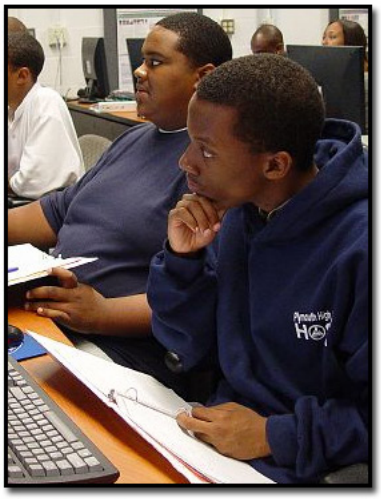
Fall 2007-Dr. Derrick Lampkin

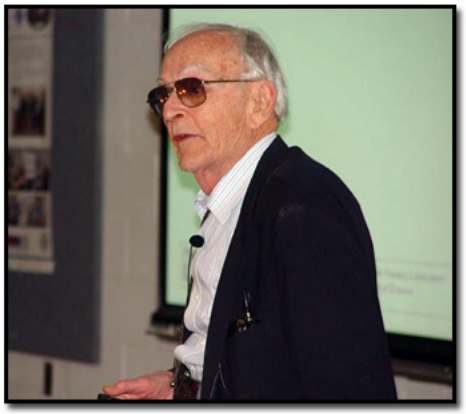
URE Researcher Unquiea Wade and Dr. Lampkin

Photo Highlights

The Undergraduate Research Experience (URE) at Elizabeth City State University (ECSU) engages undergraduate mathematics and computer science majors in academic year team research activities. Research and training meetings began in early September and were held every Tuesday and Thursday 5-8 pm through mid April. Research meetings started with a 20-30 minute announcement period during which time students learned about internship opportunities, heard program announcements, gave team reports, discussed travel logistics, and discussed the goals of the program. Following the announcement period, students met with faculty mentors or attended training on tools used for research. In addition, students spent 20 hours per week in the undergraduate research computer laboratory completing task sheet requirements and research assignments. The closing program was held on two nights in April. During the closing program, students made oral presentations of their research activities. The research teams were also required to complete written reports and to maintain a team web page. Shown below are highlights from the academic year program.

http://nia.ecsu.edu/ur.html





2007-2008 URE Research Teams

The Setup and Installation of the Dixon Hall Supercomputing Pool
Mentor: Dr. Eric Akers
Brian Campbell Bryce Carmichael Unquiea Wade

Learning and Practicing Interactive Data Language (IDL) to Manipulate Scientific Data
Mentor: Dr. Minjun Wang
Jamika Baltrop Wanda-Marie Carey Brittnei Teasley
Chelsea Vick

The Effect of Math Sprint Competition In Student Achievement On SOL Mathematics Tests At Camelot Elementary School In Chesapeake, VA
Mentor: Dr. Darnell Johnson
TreAsia Fields Tiwana Walton Chelsea Goins
Illiana Thomas Spencer Weeks-Jamieson

A Multiple Linear Regression of pCO2 against Sea Surface Temperature, Salinity, and Chlorophyll a at Station BATS and its Potential for Estimate pCO2 from Satellite Data
Mentors: Dr. Jinchun Yuan
Lee Smalls, Jr. MyAsia Reid

Implementation of a Polycom VSX 8000 Teleconferencing System: Developing Standards and Practices for Participating in Virtual Conferences
Mentor: Mr. Je'aime Powell
Michael Jeffries Vernon Brown Kaiem Frink

Redesign and Upgrade of the CERSER Website and Satellite Image Library
Mentor: Mr. Jeff Wood

Dr. Cynthia Warrick, Dean of the ECSU School of Mathematics, Science and Technology presents Dr. Howard Adams with a certificate for his presentation of "Mentoring and Graduate

Dates to Remember

http://nia.ecsu.edu/events.html

June 2 – July 25, 2008
Undergraduate Research Experience in Ocean, Marine, and Polar Science
Elizabeth City State University
http://nia.ecsu.edu/ureoms2008/

July 7 – 11, 2008
Summer Ocean Observing Educator Workshop
University of New Hampshire
http://www.cooa.unh.edu/

June 9-13, 2008
TeraGrid '08 Conference
Las Vegas, Nevada
http://www.tacc.utexas.edu/tg08/

July 6 – 11, 2008
2008 IEEE International Geoscience & Remote Sensing Symposium
Boston, Massachusetts http://www.igarss08.org/
IGARSS 2009 July 6 - 7, 2009 Capetown, South Africa
IGARSS 2010 Honolulu, Hawaii
IGARSS 2011 Sendai, Japan

October 8 – 11, 2008
WAIS's Workshop
Algonkian Regional Park Sterling, VA
http://neptune.gsfc.nasa.gov/wais/

October 27 – 31, 2008
7th AARSE Conference
Accra, Ghana http://www.aarse2008.org/

November 15 – 21, 2008
Supercomputing Conference 2008
Austin, TX http://sc08.supercomputing.org/
SC'09 November 16-19, 2009
SC'10 November 15-18, 2010
SC'11 November 14-17, 2011

December 7 – 12, 2008
4th IEEE International Conference on e-Science
Indianapolis, IN http://escience2008.iu.edu/

August 28, 2008
Academic Year URE Program Opening
Room 229 Dixon Hall, ECSU 5pm
http://nia.ecsu.edu/ur.html

ONR - URE/OMS N00014-01-1-0529 NSF - CI-TEAM OCI-0636361 CReSIS - NSF FY 2005-108CM1