ECSU's Computational Science - Scientific Visualization Center

http://cssvc.ecsu.edu

2007 - 2008 Newsletter, Volume I: September 2007 - February 2008

Computational Science - Scientific Visualization

Algorithms
(Computational Modeling)

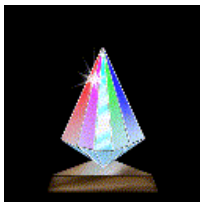
(Numerical Methods

Applications
(Science / Technology)

Architecture
(Computer Programming)
(Computer Visualization)

"A Scientific Resource Center for the School of Mathematics, Science & Technology"

The CSSV Center is a Center specializing in "an interdisciplinary approach to research, problem solving and visually displaying of data in the mathematical sciences, natural sciences and technological applications." The Center provides user friendly support services for students and faculty who are pursing research or educational endeavors which make significant uses of computational mathematics-numerical methods, mathematical modeling, high performance computer programming, using specialized computer application packages, and/or computer visualization tools and techniques.



"The mind is not a vessel to be filled but rather a flame to be ignited; when permitted to reach its potential, it is like a polished diamond radiating magnificent light"

(ECSU's CSSV CENTER)
The School of Mathematics, Science and Technology
Elizabeth City State University
Elizabeth City, North Carolina 27909; USA
URL: http://cssvc.ecsu.edu;

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Weekly Schedule

for

ECSU's Computational Science - Scientific Visualization Center [ECSU's CSSV Center]

"A Scientific Resource Center for ECSU's School of Mathematics, Science and Technology"

Located in Room 138, Lane Hall, ECSU

Monday - Friday:	**9:00 am - 5:00 pm**
Evenings and Weekends:	**By Appointments Only**

ECSU's COMPUTATIONAL SCIENCE-SCIENTIFIC VISUALIZATION CENTER

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What is Computational Science - Scientific Visualization?

Computational Science-Scientific Visualization is an approach to the study of scientific and real world phenomena by extensive use of Computational/ mathematical modeling, numerical methods and simulation; as well as computer programming and computer visualization techniques. Computational Science-Scientific visualization is not an academic area of study itself. Instead it is a methodology used to study any number of academic discipline areas; especially those that encounter situations involving large or complex data or phenomena which needs to be analyzed, interpreted or visually displayed. Computational Science-Scientific Visualization works well in four major areas of investigations; those involving phenomena or data items considered to be:

(A) Too Small/ Too Large **(B) Too Fast/ Too Slow,**

(C) Too Complex **(D) What if?**

**Today's high-performance computers, combined with better understanding of computing environments as well as advances in computer graphics- computer visualization, have permitted the emergence of Computational Science -
Scientific Visualization (CSSV), which has put the solving of many formally intractable problems/investigations within our reach.**

YEAR-ROUND RESEARCH ACTIVITIES OCCURING IN ECSU's CSSV CENTER

A. Academic Year Faculty Research
A Research Project in Computational Science is pursued by two or more Faculty members each academic year in the CSSV Center.

B. Academic Year Student Research Teams
Two or more different student teams pursue research activities in the CSSV Center each year.

C. Academic Year CSSV Center Visiting Scientists Seminar - Colloquium Series
During the Academic Year approximately eight (8) visiting scientists are invited to ECSU's School of Mathematics, Science & Technology to make a scholarly seminar or colloquium presentation involving Computational Science - Scientific Visualization activities; while visiting they relate to faculty and students interested in research in their area of expertise.

D. Academic Year Faculty Education/Training Workshops
During the Academic Year, the CSSV Center provides educational training for faculty and students in CSSV on a monthly basis (upon request). In the Spring of the year Faculty Work-shops in CSSV are provided for some fifteen (15) to twenty-five (25) faculty participants during a Regional Conference.

E. Summer Research Institute in Computational Science - Scientific Visualization
An Institute is held during the last two weeks in May each year in the CSSV Center. Three-five teams, consisting of three - five students and one - two faculty mentors develop research projects during the Institute.

F. Summer Session Faculty/Student Research Projects
A Research Project in Computational Science is pursued by one or more faculty members each summer at the CSSV Center. Moreover, two-four students develop research projects with a faculty member each summer in the CSSV Center.

G. Extramural Summer Faculty/Student Research Projects
Two or more faculty members related to the CSSV Center are involved in extramural research projects each summer. Moreover, at least six students are involved in extramural research summer projects each summer.

H. Monthly, Technical and Research Support
The CSSV Center provides Technical and Research Support for ECSU faculty and students in the School of Mathematics, Science & Technology as well as for Science and Mathematics Faculty at NAM Institutions.

ACTIVE RESEARCH TEAMS IN THE CSSV CENTER

Research Team A: Numerical Methods, Algorithms and Visualization for Solving Systems Of Equations

Faculty Leaders: J. L. Houston

- Using Computational Methods to solve systems of equations, using iterative methods.
- Using Computational Methods to solve systems of partial differential equations, using multi-grid techniques.
- Using Computational Methods to solve systems of equations of various types.

Research Team B: Computational Modeling of Optimization Problems

Faculty Leaders: J. L. Houston, Farrah Chandler and Andrea Lawrence

- Using Computational Techniques to solve and model optimization problems in one variable.
- Using Computational Techniques to solve and model optimization problems in several variables.

Research Team C: Computational Modeling of Probabilistic and Statistical Data

Faculty Leaders: J. L. Houston, A. Lawrence, and F. Chandler

- Using Computational Techniques to model and analyze probabilistic behavior.
- Using Computational Techniques to model and analyze statistical data.

Research Team D: Numerical Modeling of Data Using Searching and Sorting Techniques

Faculty Leaders: J. L. Houston and Andrea Lawrence

- Using Computational Techniques to search and organize data.
- Using Computational Techniques to sort and display data.

Research Team E: Pattern Recognition in Genomic Data

Faculty Leaders: J. L. Houston

- Using Computational Science Techniques to search Genomic Data for patterns and exceptions to patterns.
- Using Computational Science Techniques to search for rare phenomena, unexpected patterns and outliers.

Research Team F: Data Mining and Visualization of Data

Faculty Leaders: J. L. Houston, Andrea Lawrence and Farrah Chandler

- Using Computational Science Techniques to analyze data for association and influences.
- Using Computational Science Techniques to guide what to visualize and how to visualize it.

ELIZABETH CITY STATE UNIVERSITY
SCHOOL OF MATHEMATICS, SCIENCE AND TECHNOLOGY

Announces

Research Week 2008

February 4 – 8, 2008

Theme: Enhancing Research, Education and Outreach

All units in the school of MST will be participating in one or more of the following ways……

- A motivating look at ECSU faculty research & scholarly activities
- Colloquium presentations by well-known scientists and researchers
- Displays and posters from various departments and agencies
- Pre-College & Community College session
- Student Science Bowl Competition
- Student research poster session
- Panel presentations
- Research fair

For more information or to learn how to participate please contact:
Dr. Ronald Blackmon, Vice Chancellor for Academic Affairs, (252) 335-3710, rhblackmon2@mail.ecsu.edu
Dr. Cynthia Warrick, Dean of the School of Mathematics, Science and Technology, (252) 335-3189, cawarrick@mail.ecsu.edu
Dr. Linda Bailey Hayden, Associate Dean of the School of Mathematics, Science and Technology, (252) 335-3696, haydenl@mindspring.com

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Announcing Applications Available for

ECSU - NAM's 2008 Computational Science Workshop Mini-Grants to attend Computational Science Workshops at NAM's 2008 Regional Faculty Conference on Research and Teaching Excellence; April 4 – 5, 2008

Hosted by Bennett College, Greensboro, NC

Faculty Education / Research Training Workshops will be conducted in Computational Science—Scientific Visualization

For application for Mini-Grant, see page 8.

ECSU - NAM 2008 SUMMER RESEARCH INSTITUTE IN COMPUTATIONAL SCIENCE-SCIENTIFIC VISUALIZATION

May 12 – 23, 2008

This Institute is an intense two-weeks program where participants learn research skills by tutorials, presentations by experts and by actual research experiences.

The Institute's focus is:

"To Explore and Engage in Research Activities that are of interest to DoE and To Enhance Increased Involvement and Productivity in future DoE Related Research."

The Institute is designed to enhance the research skills of students for summer internships and graduate study.

Sponsored by Elizabeth City State University's CSSV Center and the National Association of Mathematicians, Inc. (NAM) and with funding support from the Dept. of Energy (DoE).

Participation Limited: 20 students, 4 faculty; application-selection-acceptance required. Conference participants will receive lodging, a food allowance for meals and a $500 stipend (students). A stipend will also be provided to faculty participants. (A maximum of $300 is provided for travel to and from the Institute.)

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A. Length of Time: **Two (2) Weeks**
B. Institute Dates: **May 12 - 23, 2008**

C. Generic Institute Structure: Tutorials -Lab Assignments-Presentations-Project Dev.
D. Participants: Twenty (20) Student Mathematics/Computer Science Majors,
Four (4) Mathematical Sciences Faculty Mentors - Team Leaders,
{Four (4) Research Teams; 5 students - 1 faculty, per team}

For application/information, contact Johnny L. Houston at (252) 335-3361, Fax: (252) 335-3280 (email: jlhouston@mail.ecsu.edu or visit the CSSV Center Website http://cssvc.ecsu.edu

NAM's 2008 Regional Faculty Conference On Research and Teaching Excellence

Hosted by Bennett College, Greensboro, NC, April 4-5, 2008

Application - Registration for Conference/Mini - Grant Support

For Mini-Grant Support Consideration, Please Return By March 7, 2008

Please Print in Ink or Type the Following Information:
Name (Dr.__ Prof. __ Mr. __ Mrs.__ Ms.__) _____

Position _____ Institution_____

(Please use address where you would like Conference information to be mailed)

Mailing Address _____

City_____ State_____ Zip Code _____

Telephone: Day ( )_____ Evening ( )_____

E-Mail _____ Fax Number ( )_____

Application for ECSU – NAM Computational Science Workshop Mini-Grant Support ($400.00 per applicant)

Please complete the section below **only** if you are requesting a Mini Grant for Conference Support.

Conference Grant Support is designed to cover travel, lodging, food and registration.
Persons requesting grant support should include a one page letter/application stating how this conference would enhance them professionally.

For selected participant, the Participant will receive a check for $400.00 for travel and lodging.

Travel Support

Travel support covers a maximum of $300 for an economical round-trip airfare, a rental car or for the use of a personal car up to this amount at a rate of $.40 per mile.

I will travel (check one): ____ by car _____ by air ___other

My airport and city of departure _____

Lodging Support - Local Travel

Lodging support – local travel covers a maximum cost of $100.00. Colleagues who desire to share a room are encouraged to submit both applications together and should arrange your reservations accordingly.

Signature _____ (Required for funding)

SSN _____(Required for funding)

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ECSU-NAM 2008 STUDENT RESEARCH INSTITUTE IN COMPUTATIONAL SCIENCE-SCIENTIFIC VISUALIZATION
May 12, 2008—May 23, 2008
STUDENT APPLICATION

NOTE: Funding guidelines require participants to be U.S. citizens or permanent residents. This Institute is designed for rising seniors and graduating seniors who plan to do an internship during the summer of 2008 and who plan to attend graduate school after graduation.

To apply, you should be at least a junior (2007-2008 Academic year) with a GPA of 3.0 or higher:

(a) complete this form
(b) briefly describe (on the back) your mathematics/computer science interests and career goals
(c) send a copy of your current college transcript (unofficial copy is acceptable)
(d) include one letter of reference (from a mathematics/science professor) with your application.

The complete application, along with required materials, should be sent by **April 9, 2008** to:

The CSSV Center
Elizabeth City State University
Campus Box 959
Elizabeth City, North Carolina 27909
Fax: (252) 335-3651 Alt. Fax: (252) 335-3487

Name _____

Social Security Number _____ Birth Date _____

Expected date of graduation _____ Current/Exptected GPA _____

Name of your Institution _____

College Phone Number _____ Home Phone Number _____

College Address _____ City _____ State _____ Zip _____

Home Address _____ City _____ State _____ Zip _____

Email Address _____

2008-2009 Fall Semester Classification: # of hours earned by May 2008 _____

Name, address and phone number of person writing reference (should be a college math/science professor who has taught you)

Name _____ Phone Number _____

Institution _____

Address _____

_____

Please provide the following information (applicant):

Gender: ☐ Male ☐ Female

Race: ☐ African America ☐ Hispanic American ☐ Native American ☐ Asian American ☐ Caucasian ☐ Other

Deadline: April 9, 2008
Page 2, Student Application

I. Classes Completed: Give titles of college mathematics/computer science courses completed by 5/15/08.

II. Career Goals: Briefly describe your mathematics/science interests and career goals.

III. 2008 Summer Plans: What are your plans for the summer of 2208 between 6/1/08 & 8/15/08?

IV. Do you plan to do a 2008—2009 academic project?

V. What discipline area do you plan to study in graduate school?

Signature _____ Date _____

The CSSV Center's Visiting Scientist Seminar—Colloquium Series

The School of Mathematics, Science, and Technology

As a method to heighten awareness of different kinds of scientific knowledge, to stimulate research interest in different knowledge areas, to provide experts to dialogue with ECSU/NAM's institutions researchers, and to permit students to relate to external role models in different areas of mathematics, science, and technology, there is a monthly Visiting Scientists / Seminar-Colloquium Series. For four months during the fall semester (August – November) and four months during the spring semester (January – April), plans and arrangements are made to have a visiting scientist to come to the campus of Elizabeth City State University to make a seminar presentation for a large and varied audience and possibly one or two specialized lectures for a smaller audience. As often as feasible, the visit is one that a professional, a researcher, group of researchers (at ECSU or at some NAM institution) or a discipline area (at ECSU) would be interested in having a dialogue. The monthly seminar-colloquium presentations are scheduled for Thursday afternoons so that the Visiting Scientists may arrange to spend 1-3 days during a visit. During the summer months visiting scientists are invited to present to the Summer Institute participants. On the website **http://cssvc.ecsu.edu**, one may learn additional details by selecting Colloquium Series link from the menu and then selecting the desired year. .

Elizabeth City State University

Dr. Cynthia Warrick, Dean of the School of Mathematics, Science and Technology

On behalf of the Students, Faculty & Staff in the School of Mathematics, Science and Technology, I would like to thank all participants of Research Week 2008 at Elizabeth City State University. This year's theme, "Enhancing Research, Education and Outreach" promotes research and learning through partnerships with Academic Alliances, State and Federal Agencies, Private Industry community.

Research Week 2008 was funded by a grant from the North Carolina Space Grant Informal Education and Public Outreach Program. Through NC Space Grant Funding we were able to bring Dr. Bernard Harris as our key note speaker on Friday, February 8. He will address more than 400 undergraduate and local high school students and talk about his motivation on becoming a physician, astronaut, as the first African American to walk in space. We want to acknowledge NC Space Grant for their support and participation in making this year's event a huge success.

We also want to acknowledge support from The Federation of American Societies for Experimental Biology (FASEB) Minority Access to Research Careers (MARC) Visiting Scientist Program that is funding the presentations by Dr. Howard G. Adams on Tuesday, February 6. Dr. Adams will address ECSU undergraduate students on choosing graduate school and he will also address the ECSU faculty on "How to Mentor Students."

The Department of Energy funded Computational Science – Scientific Visualization Center (CSSV) provided the support to bring Dr. Leona Harris from the College of New Jersey Department of Mathematics & Statistics. Dr. Harris will share her research on modeling the fate and transport of human exposure to perfluorinated chemicals in the environment.

The ECSU Component of the Virginia – North Carolina Louis Stokes Alliance for Minority Participation (VA-NC LSAMP) program and The Center of Excellence in Remote Sensing Education and Research's aim is to increase the number of underrepresented minorities in Science, Technology, Engineering & Math (STEM). VA-NC LSAMP and The Center of Excellence in Remote Sensing Education and Research also contributed resources to support student researcher participation in Research Week 2008.

Our Annual Research Fair will bring over 15 graduate programs and organizations to share information about graduate study, research opportunities and summer internships spanning from North Carolina and Virginia to Georgia, Florida, and Texas. Research Week 2008 demonstrates the collaborations and partnerships that the ECSU School of Mathematics, Science & Technology has developed and nurtured over the years.

Because February is Black History Month, Research Week 2008 celebrates the accomplishments of African Americans and HBCU scientists who have made significant contributions in math, science and technology. Our goal is to enhance excitement and enthusiasm about science to our students, faculty, partners, and especially to the local community and future students at Elizabeth City State University, to create new knowledge to improve the lives of our residents through academic excellence, economic development and collaborative research partnerships.

Research Week - Schedule of Events

Monday, February 4, 3-5:00 pm
MST Panel Presentation
Room 206, Student Union Center
Presiding - Dr. Gary Harmon
Welcome - Dr. Ronald Blackmon
The Occasion—Dr. Cynthia Warrick

"Major African American Contributors in Mathematics, Science and Technology"

African-American Contributions Panelist:
Farrah Chandler (Math/Computer Science)
J. Anthony Sharp (Technology/ Aviation)
Josiah J. Sampson, III (Biology)
Guana Dixon (Physics)
Anthony Emekalam (Pharmacy)

Tuesday, February 5, (two sessions)
Mentoring and Graduate School Seminars
Dr. Howard Adams
H. G. Adams and Associates, Inc.

"Why You Should Choose Graduate School"
11 am - 12:20 pm (student session)
Room 206 Student Union Center
Presiding - Dr. Linda Hayden
Welcome - Dr. Cynthia Warrick
Introduction of Speaker - Dr. Ali Khan

"How To Mentor Students"
2—3:30 pm (faculty session)
Room 138 Jenkins Science Center
Introduction of Speaker: Dr. Margaret Young

Wednesday, February 6, 3 - 4:00 pm
Room 206 Student Union Center
Presiding - Dr. Mehran Elahi
Welcome - Dr. Cynthia Warrick

Wednesday, February 6, 3 - 4 pm (continued)
Introduction of Speaker - Dr. Johnny Houston/Dr. Farrah Chandler

Dr. Leona Harris
The College of New Jersey, Department of Mathematics and Statistics
"Modeling the Fate and Transport of a Common Household Chemical in the Body Following Oral Exposure"

Thursday, February 7
Room 206 Student Union Center
Research & Graduate School Fair
11 am - 4 pm Student Poster Displays
Presiding - Dr. Jayfus Doswell

MST Science Bowl Competition
2:00 - 3:30 pm
Presiding— Dr. H. Leon Pringle

Friday, February 8
Presiding - Dr. Darnell Johnson
Welcome - Dr. Willie Gilchrist
Introduction of Speaker - Dr. Cynthia Warrick

Demonstrations - 9 - 11 am
Virginia Air and Space Center
K. E. White Graduate Center

Dr. Bernard Harris
"An Astronaut's View: The Power of the Dream"
11:30 am - 1 pm
Mickey L. Burnim Fine Arts Center

2007— 2008 Seminar/Colloquium Series

September 2007

"The Application of Photonics to Biosciences and Medicine" by Dr. Dennis Matthews

Abstract: In this presentation the presenter discusses several research projects and associated applications of photonic to science and medicine. There will also be a discussion of how the various projects at the University of California – Davis' Center for Biophotonics Science and Technology, especially discussing how college students, graduate school students, and external professionals are involved in their implementation.

Brief Bio: Dr. Matthews is Program Leader for the Medical Technology Program at Lawrence Livermore National Laboratory as well as professor within the UC Davis Department of Applied Science and School of Medicine. He is also an Associate Director of the UC Davis Integrated Cancer Program. He received his Ph.D. in Physics in 1974 from the University of Texas at Austin. Dr. Matthews is an expert on the radiative properties of ions in plasmas as well as in the conversion of laser light into X-rays. Dr. Matthews has also worked for short periods at the Hahn Meitner Institut in Germany, Rutherford-Appleton Laboratories in Great Britain, the University of Paris-Orsay and the Centre d'Etudes de Limeil-Valenton in France. He directly supervises ~50 scientists, engineers, 8 graduate students, a 25 student summer intern program and 8 other support staff. Dr. Matthews is responsible for the development of industrial and medical applications of Lawrence Livermore National Lab Technology, especially for the prevention, screening, diagnosis and treatment of diseases such as diabetes, stroke, brain trauma, chronic pain and cardiovascular disease. Dr. Matthews is also responsible for founding a biomedical technology stem of research and teaching curriculum within the Department of Applied Science. Current projects and those already successfully transferred to industry include: an opto-acoustic recanalization device for treating ischemic stroke; a miniature x-ray source which is mounted on a microcatheter and used to treat coronary artery restenosis; micropower impulse radar for numerous medical diagnostics including differentiating hemorrhagic vs. ischemic stroke; an implantable, continuous glucose monitor and ultra-short-pulse laser microsurgery devices. Dr. Matthews is a co-Principal Investigator on a Department of Energy funded Center of Excellence for Application of Lasers to Medicine and on a NIH Unconventional Innovations Program Grant to Develop Compact Light Sources for Mammography and Radiotherapy.

"Research and Professional Services in Private Industry" by Dr. Mave T. Houston,

Abstract: In this presentation the presenter will discuss research professional services. How these services are provided on a contract basis by (usually licensed) professionals – software development, accounting, law, engineering, management consulting, etc. – and are often offered by limited partnerships, where customers are clients and companies are firms. Specific discussions will be directed as to how computer science and engineering graduates can effectively serve in research centers for private industry.

Brief Bio: Dr. Mave T. Houston is a User Experience Researcher for the Center for Advanced Research at PriceWaterhouseCoopers in San Jose, CA. She is responsible for ensuring that her project development adheres to a User Centered Design process. Her role includes testing the usability of current research prototypes and determining how to make the software more efficient and effective for users. While completing a Postdoctorate at IBM Almaden Research Center in San Jose, CA, she conducted numerous user studies involving Ethnographic Coding and Analysis, benchmarking, and video coding. Her work centered around making sense of large document collections and she is well-versed in visualization techniques as they relate to the sensemaking of complex information for business and government intelligence analysis. Dr. Houston received her doctoral degree in Computer Science and Software Engineering in 2005 from Auburn University, where she was an active member of the Intelligent and Interactive Systems Group. She received her Master of Science degree in Computer Science and Computer Engineering from Auburn University in 1997,and her Bachelor of Science Degree from Spelman College in 1995.

2007— 2008 Seminar/Colloquium Series

February 2008

"Modeling the Fate and Transport of a Common Household Chemical in the Body Following Oral Exposure"

Dr. Leona Harris, The College of New Jersey,
Department of Mathematics and Statistics

Abstract: Perfluorooctane sulfonate (PFOS), a member of a class of perfluorinated chemicals used in a variety of consumer products as oil, water, and grease repellants, has been shown to be toxic in laboratory animals. Because PFOS has also been shown to be widely distributed throughout the environment, there have been growing concerns about its potential health risk to humans. The mathematical model to be presented describes the pharmacokinetics (absorption, distribution, metabolism, and elimination) of PFOS in the body following single and repeated oral exposures and provides a framework for dose-response analyses needed to help assess the risk that exposure to PFOS might have on human health and the environment.

Brief Bio: Dr. Leona A. Harris attended Spelman College in Atlanta, Georgia where she participated in the Scholars in Mathematics at Spelman Program. She graduated magna cum laude from Spelman in 1995 with a B.S. in Mathematics, and earned her M.S. and Ph.D. in Applied Mathematics from North Carolina State University in 1999 and 2001, respectively. After completing her postdoctoral work in August 2004 at the National Health and Environmental Effects Research Laboratory of the U.S. Environmental Protection Agency (EPA), she joined the faculty at Bennett College as an Assistant Professor of Mathematics. In 2005, Dr. Harris was given the honor of presenting the MAA-NAM David Blackwell Lecture on her research at Mathfest in Albuquerque, New Mexico. In August 2006, Dr. Harris joined the faculty at The College of New Jersey as an Assistant Professor of Mathematics. Dr. Harris specializes in Mathematical Biology and has continued her work with EPA scientists in the National Center for Computational Toxicology. Her current research involves the development and utilization of mathematical models that describe the fate of a toxic chemical in the body following some sort of external exposure to the chemical (e.g. inhalation, ingestion).

March 2008

"Proximity of Weighted and Exponential Distributions"

Dr. Broderick O. Oluyede, Georgia Southern University,
Department of Mathematical Sciences

Abstract: Weighted distributions occur in a wide variety of settings including biometry, reliability, and stochastic processes. In this talk, results on proximity of weighted distributions and exponential distributions in the class of distribution with monotone hazard functions are presented. Some moment-type inequalities and applications are presented.

Brief Bio: Dr. Broderick O. Oluyede has been an Associate Professor of Mathematics and Statistics at Georgia Southern University since 2000. He received his Ph.D. in Mathematics, with a concentration in Statistics, in 1991, from Bowling Green State University. His research interests include survival analysis, categorical data analysis, order restricted inference, statistical computing, and multi-

To find more details about other activities associated with ECSU's Computational Science - Scientific Visualization Center and/or activities sponsored by the Center, please visit the URL below:

http://cssvc.ecsu.edu

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