WESTERN CONNECTICUT STATE UNIVERSITY

WestConn Research Day

May 4, 2012

Luncheon with Seminar Presentations 11:30 a.m. - 1:30 p.m.
Student Center Room 201 – Midtown Campus

Registration and Poster Setup 1:30 - 2 p.m.
Science Building Atrium – Midtown Campus

Keynote Address: Dr. Mary Ellen Doherty 2 - 2:45 p.m.
Science Building Room 125 – Midtown Campus

Poster Session 2:45 - 4:30 p.m.
Science Building Atrium – Midtown Campus

Concluding Remarks and Awarding of Provost's Prize 4:30 - 4:45 p.m.
Science Building Room 125 – Midtown Campus

Refreshments will be served during the poster session in the Atrium of the Science Building.

KEYNOTE ADDRESS

"The Journey to Our Book"

Dr. Mary Ellen Doherty

Associate Professor of Nursing
Western CT State University

Abstract

A discussion on how Doherty and her research colleague, Dr. Elizabeth Scannell-Desch, conducted three studies that became the basis for their new book, Nurses in War: Voices from Iraq and Afghanistan, released April 23 by Springer Publishing Co. Their research work explored the experience of U.S. military nurses in the Iraq and Afghanistan wars from 2003 to 2011, women's health and hygiene experiences during Iraq and Afghanistan deployments, and parental separation experiences for deployed nurses with children.

Biography

Dr. Mary Ellen Doherty, a Ph.D. recipient from the University of Rhode Island and member of the WCSU nursing faculty since 2008, has conducted extensive research in the areas of childbearing and women's health, and, most recently, has pursued research on the experiences of military nurses who served in the Iraq and Afghanistan conflicts between 2003 and 2008. She has delivered research presentations at three scientific sessions sponsored by the Eastern Nursing Research Society as well as at research congress meetings of the Sigma Theta Tau International Honor Society of Nursing held in Ireland in 2004 and in Austria in 2007. Specific topics addressed in her research studies include nurse-client decision making, birth plans, widowhood during pregnancy, therapeutic alliance, and the experiences of midwives and their clients.

Prior to joining the Western faculty, Doherty held academic positions at Northeastern University and the University of Massachusetts at Lowell. A specialist in the fields of nurse-midwifery, childbirth education and maternal nursing of newborns, she holds a master's degree in maternal-child nursing from Rutgers University and a certificate in nurse-midwifery from the University of Medicine and Dentistry of New Jersey. She founded and served as president of Concord Nurse-Midwifery Associates in Concord, Mass., and holds memberships in regional, national and international nursing organizations.[1]

[1] Written by Robert Taylor, University Relations Staff, WCSU.

Student Participants

Abstract #	Author(s)	Title	Session
1	Samantha Augustine and Zachary Dell	Cataloguing the Microscopic Eukaryotic Organisms of Lake Lillinonah Using the 18S Ribosomal RNA Gene	Poster
2	Anisa Barolli and Chantal Ridlon	Investigating Modified Nucleosides within DNA	Poster
3	Kaitlin Bookless	Internship in Museum Studies	Poster
4	Kelley Bradley and Stephen Barabas	A Case Study of Tornadogenesis in New England: The Greater Springfield Tornado on 1 June 2011	Poster
5	Melissa Carvalho, Tion Perkins, and Drilon Toska	A Comparative Metagenomic Analysis of Microbial Communities Along the Housatonic River in Connecticut	Poster
6	Devon Corbett	How Does the Identity of Sports Fans Affect the way in which They Communicate with Other Sports Fans from Opposing Teams?	Poster
7	Amy Dougherty	Biochemical Studies of Sialic Acid Synthase (NeuB) from *H. pylori*	Poster
8	Michele Dubiel	The Relationship Between Physical Exercise and Motivation in School and School Performance	Poster
9	Yinnet Espinal, Rebecca Greene-Cramer, and Chantal Ridlon	The Stability of Modified Oligonucleotides	Poster
10	Nicholas Galey	The Effects of Ego Orientation versus Task Orientation on Individual Success	Poster
11	Ashley Heffernan	Determining the Substrate and Function of JHP1130	Poster
12	Matthew Hsuing	Has Jazz a Future?	Seminar

Abstract #	Author(s)	Title	Session
13	Richard Jacob	Comparison of the German Constitutions	Poster
14	Alanna Katz and Christopher Edwards	Organizational Costs of E-Commerce	Poster
15	Donal Keith, Jennifer Torres, and Jessica Jahr	Metagenomic Analysis of Water Sources in the Westside Nature Preserve Using Cytochrome Oxidase I Gene Barcode Region	Poster
16	Bernadene Lawrence-Phillip	Exploring Professional Development Deterrents of Night Shift Nurses	Poster
17	Sara Lewis and Kristin Santa Maria	The Writing Life: A Documentary Film Featuring America's Working Writers	Seminar
18	Brittany Lindquist	Themes and Appeals During Children's Programming and Advertising	Poster
19	Shirley Maignan and Brittany Mariani	Analysis of Prokaryotes in Rabbit Feces	Poster
20	Shannon McDonald, Jordan Orfitelli, Kara Pescetelli, and Emily Gillaugh	Presenting Local History to the Public and Application of Theory	Poster
21	Sami Merhi, Phanuel Mariano, and Pierce O'Donnell	Wavelet-Based Recognition Algorithms	Poster
22	Candy Murias	Visual Search Amongst Collectivist and Independent Individuals	Poster
23	Candy Murias	Influence of Television on Family Values	Poster
24	Christopher O'Rielly	The Spy in American Memory: From the Cold War to Present	Poster
25	Chantal Ridlon	Student Motivation to Learn STEM Content Through Informal Education: A Comparison Between Male and Female Students	Poster

Abstract #	Author(s)	Title	Session
26	David Rogers	The Middle Eastern Balance of Power: Palestine Rising	Seminar
27	Michael Rogowski	Encoding Proofs in a Functional Programming Language	Poster
28	Steven Schmidt	Estimating Cloud Fraction over Long Island Sound for the Summer Months of 2004 using Satellite Derived Estimates of Surface Solar Irradiance	Poster
29	Ann Marie Selva	Metagenomic Analysis of Microeukaryotic Organisms in Candlewood Lake	Poster
30	Jamie Smith	Pink vs. Blue: The Effect of Gender on Color Choice	Poster
31	Nicole Stiteler and Matthew Wimbrow	Comparison of Prokaryotic Species Present in Regurgitated Pellets From Wild and Captive Great Horned Owls (*Bubo virginianus*)	Poster
32	Melissa Telesco	Being Proactive in Your Domain Against Cyberbullying	Poster
33	Karen Thompson	Peridomestic Risk for Lyme Disease	Poster
34	Chad Yantorno	Vulnerabilities of WCSU's Open Network to Staff and Students from Outside Attacks	Poster

Faculty Participants
Research Sponsors

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Dr. Theodora Pinou	Biological & Environmental Sciences
Dr. Anne Roberts	Chemistry
Dr. Xiaodi Wang	Mathematics
Dr. Steven Ward	Sociology
Deborah Weisz	Music
Dr. Edwin Wong	Biology

Abstracts

Poster Presentations

listed in alphabetical order by first author

1 Cataloguing the Microscopic Eukaryotic Organisms of Lake Lillinonah Using the 18S Ribosomal RNA Gene

Samantha Augustine and Zachary Dell
(Dr. Edwin Wong, Dept. of Biology)

Lake Lillinonah has not been extensively studied; thus, the microscopic organisms in this body of water are largely unknown. This project set out to develop an 18S RNA gene database of eukaryotic microorganisms within the lake. Creating a catalogue of these microscopic life forms allows for the discovery of unknown species, assessing biodiversity, and monitoring the outcomes of factors that may negatively affect the lake's ecosystem, including climate change, pollution, and man-made alterations. Types of organisms catalogued include copepods, diatoms, insect larvae, and plants.

2 Investigating Modified Nucleosides within DNA

Anisa Barolli and Chantal Ridlon
(Dr. Nicholas J. Greco, Dept. of Chemistry)

Deoxyribonucleic acid (DNA) is an essential biomolecule whose importance includes passing on genes, controlling production of proteins in living organisms, and is utilized to help solve criminal cases. Since its discovery, the structure of DNA has been modified in order to modulate its function. Nucleotide modifications have focused on synthetically modifying the sugar, backbone or nucleobase. Our research has focused on nucleobase modification, specifically at the 5 position of the pyrimidine nucleus. This study focused on 5-aryl modified pyrimidines. The thermodynamic stability of these modified oligonucleotides were investigated and compared to both native control strands and previously investigated modified oligonucleotides.

3 Internship in Museum Studies

Kaitlin Bookless
(Dr. Thomas Philbrick, Dept. of Biology)

Most undergraduates do not have the opportunity to work with world-class museum collections. The collections at the Yale-Peabody Museum contain over 11 million specimens dating back to the 1800s, and I have had the privilege of interning in the Invertebrate Zoology Department working with some of these specimens. Working with these collections has taught me to identify, preserve, and catalog specimens according to their taxonomic level. This hands-on process has allowed me to understand the logistics

of museum life beyond the exhibits. Proper curation and preservation of these specimens has shown me how important museum collections are to the world of science.

4 A Case Study of Tornadogenesis in New England: The Greater Springfield Tornado on 1 June 2011

Kelley Bradley and Stephen Barabas
(Robert Eisenson, Dept. of Meteorology)

Tornadogenesis in New England has always been of interest because of its rarity, especially when a strong tornado impacts a highly populated area. This research examines an example of such an event by analyzing the development of the high-end EF3 tornado that hit Springfield, MA on 1 June 2011. Using data including BUFKIT soundings and radar visuals, the atmospheric dynamics were analyzed in order to understand the processes associated with tornadogenesis in this area. Topographic elements of the area were also considered and found to enhance tornado development.

5 A Comparative Metagenomic Analysis of Microbial Communities Along the Housatonic River in Connecticut

Melissa Carvalho and Tion Perkins and Drilon Toska
(Dr. Edwin Wong, Dept. of Biology)

Pollution threatens all organisms in the Housatonic River ecosystem. High levels of chemical contamination may be reflected in the biodiversity of bacteria found in the river. Our research examined bacterial diversity in sediment samples from two distal locations at northern and southern Housatonic River sites. DNA was isolated from the sediment, prokaryotic 16S rRNA genes were amplified using PCR and sequenced accordingly. Among the species found were bacteria that favor environments with acidic pH levels and heavy metal contamination.

6 How Does the Identity of Sports Fans Affect the way in which They Communicate with Other Sports Fans from Opposing Teams?

Devon Corbett
(Dr. Jessica Eckstein, Dept. of Communications)

This study investigates how sports fans identify themselves as “fans” and how they communicate with fans from opposing teams. Whether the communication was verbal, non-verbal, or via social media was researched. A qualitative survey given to people between the ages of 18 and 25 asked fans why they chose their team and how these teams can either bring people together or push people apart. Findings indicate that most people connect with other fans through social media. These results have implications for sports teams.

7 Biochemical Studies of Sialic Acid Synthase (NeuB) from *H. pylori*

Amy Dougherty
(Dr. Anne Roberts, Dept. of Chemistry)

Helicobacter pylori is a gram negative bacteria that can cause inflammation of the stomach lining and is strongly linked to the development of peptic ulcers. NeuB from H. pylori catalyzes the formation of N-acetylneuraminic acid (sialic acid) from phosphoenol pyruvate and N-acetylmannosamine. Several bacteria have sialic acid containing polysaccharides on their surface which may act as a cloaking device to evade the human immune system. NeuB has been previously cloned and expressed in the laboratory but was inactive. We have purified NeuB and are examining its structural characteristics using size exclusion chromatography. Refolding of the protein may be attempted.

8 The Relationship Between Physical Exercise and Motivation in School and School Performance

Michele Dubiel
(Dr. Patricia O'Neill, Dept. of Psychology)

The relationship between physical exercise, motivation in school, and school performance was investigated. Seventeen participants from a public northeastern state university completed a questionnaire regarding physical activity, motivation in school, and overall success in school. Contrary to expected results, no significant relationship between these factors was found.

9 The Stability of Modified Oligonucleotides

Yinnet Espinal, Rebecca Greene-Cramer, and Chantal Ridlon
(Dr. Nicholas Greco, Dept. of Chemistry)

The importance of deoxyribonucleic acid (DNA) as an essential biomolecule has been evident since its initial discovery. The structure of DNA has been vital to our understanding of its various functions. Over the past 60 years, nucleotide modifications have focused on the sugar, backbone or nucleobase. Our research focused on nucleobase modification, where the 5 position of the pyrimidine nucleus is targeted. This study focused on a series of 5-aryl modified pyrimidines that have been incorporated into a 15-mer strand of DNA. The general stability of these modified strands were further investigated and compared to the corresponding native strands.

10 The Effects of Ego Orientation versus Task Orientation on Individual Success

Nicholas Galley
(Dr. Patricia O'Neill, Dept. of Psychology)

Previous research suggests that individuals who use goal-setting techniques will achieve more success than individuals who do not. Research also suggests that individuals who are task-oriented will complete tasks more quickly than people who are ego-oriented. To test these findings, participants completed a task-ego orientation questionnaire and then assigned to one of three groups: task orientation, ego orientation, or control. They were told to play the game "Where's Waldo" after receiving group-specific instructions. Preliminary results indicate that individuals in the task orientation group performed the task more quickly. Results and future research plans are discussed.

11 Determining the Substrate and Function of JHP1130

Ashley Heffernan
(Dr. Anne Roberts, Dept. of Chemistry)

Helicobacter pylori is a gram negative bacterium that causes peptic ulcers and is linked to gastric malignancies. The functions of many of H. pylori's genes are not yet known. The gene jhp1130 is a member of the HaloAcid Dehalogenase (HAD) superfamily. The presence of three conserved sequence motifs indicates that the jhp1130 protein likely functions as a small molecule phosphatase. We have cloned, expressed, and purified jhp1130 to homogeneity and are testing its activity using a variety of small phosphorylated molecules. The goal of this research is to find the true in *vivo* substrate and the metabolic function of jhp1130.

13 Comparison of the German Constitutions

Richard Jacob
(Dr. Carina Bandhauer, Dept. of Social Sciences)

Germany is important for a number of reasons. Since Germany is one of the United States' most important allies, it is beneficial to try to understand Germany's actions and motivations. The purpose of this research is to develop an understanding of the world's fourth most powerful economy and one of the most influential powers in recorded history.

14 Organizational Costs of E-Commerce

Alanna Katz and Christopher Edwards
(Dr. John Coleman, Dept. of Management)

The costs of E-commerce are far-reaching and are attached to every level of an organization's operation including hiring, supply-chain management, customer buying, and data warehousing. E-commerce helps save companies millions of dollars and generates revenue through identifying and leveraging new strategies to reach consumers; this is why operations management is one of the fastest growing segments in business. This research explores the expanding role of the operations management segment associated with E-commerce.

15 Metagenomic Analysis of Water Sources in the Westside Nature Preserve Using Cytochrome Oxidase I Gene Barcode Region

Donal Keith, Jennifer Torres and Jessica Jahr
(Dr. Edwin Wong, Dept. of Biology)

The Westside Nature Preserve represents an ecological island on University property. Two samples were collected from within the Preserve, one from a slow flowing water source (crater), the other from a fast flowing outlet (stream). The goal of the research was to identify species by sequencing the cytochrome oxidase I gene barcode region which is specific to Eukaryotic mitochondria. DNA analysis was used to describe the different microscopic Eukaryotic communities. The data indicated communities of protists and fungi are represented within the two microenvironments.

16 Exploring Professional Development Deterrents of Night Shift Nurses

Bernadene Lawrence-Phillip
(Dr. Laurel Halloran, Dept. of Nursing)

Continuous and rapid changes in health care require that all registered nurses be lifelong learners by participation in professional development activities. Engaging in professional development activities help to enhance patient care by keeping nurses up-to-date on current treatment modalities and abreast of issues within the profession. An assessment of night shift nurses' professional development experience is essential to assess how accessible these activities are for nurses working off shift. Using the Deterrents to Participation Scale, this study identified work constraints or scheduling difficulties and cost and the top two most influential deterrents to their endeavors at professional development activity participation.

18 Themes and Appeals During Children's Programming and Advertising

Brittany Lindquist
(Dr. Jessica Eckstein, Dept. of Communication)

Successful marketing professionals should match television commericals to specific audiences. Using thematic analysis, commercials shown during "SpongeBob SquarePants" on Nickelodeon were investigated to determine whether their themes corresponded with the themes displayed during that program. Results indicated that commercials were product-oriented toward the prospective audience, but there was no thematic correlation between the commericals and the specific episode. Findings have implications for marketers and parents alike.

19 Analysis of Prokaryotes in Rabbit Feces

Shirley Maignan and Brittany Mariani
(Dr. Edwin Wong, Dept. of Biology)

Previous studies found that environment and diet affect the microbial communities in the gut or fecal matter of mammals. The current study focused on a comparative analysis of fecal microbes found in rabbits from different environments and fed different diets. DNA was isolated from the fecal matter; 16S rRNA genes were amplified and sequenced to determine the different bacterial species. Further sequence analysis of the DNA was used to identify phylogenetic relationships. The main bacteria detected were of the genus Bacteriodes; however there was some variation found between rabbits.

20 Presenting Local History to the Public and Application of Theory

Shannon McDonald, Jordan Orfitelli, Kara Pescetelli and Emily Gillaugh
(Dr. Leslie Lindenauer, Dept. of History)

Through an online exhibit, we present the Picket family who resided in Danbury, CT in the eighteenth century. Personal artifacts were used to tell their story. The online exhibit shows the importance of going beyond the conventional avenue of the study of history, and the importance of research in an undergraduate curriculum. It also addresses the importance of making scholarly sources easily accessbile to the public.

21 Wavelet-Based Recognition Algorithms

Sami Merhi, Phanuel Mariano, and Pierce O'Donnell
(Dr. Xiaodi Wang, Dept. of Mathematics)

Fingerprint and face recognition are convenient methods of identification. Popular face recognition algorithms include the Eigenface Method which has been shown to have a high recognition rate. Methods of recognition require large storage space. Wavelets will not only represent faces as primary and secondary features, but also compress data dramatically and reduce storage requirements. We propose a new recognition algorithm based on wavelet analysis. M-Band wavelets are used to decompose face and fingerprint images into 2^M frequency levels. The efficiency of this approach is tested using Principal Component Analysis (PCA).

22 Visual Search Amongst Collectivist and Independent Individuals

Candy Murias
(Dr. Rondall Khoo, Dept. of Psychology)

Previous research has shown that individuals with more collectivist tendencies (such as East Asians) seem to attend and place more detail on background elements when perceiving an image or visual scene in comparison to Westerners who tend to focus on the focal point of an image. The purpose of this study is to examine whether there is a significant difference in the response time of collectivist and independent individuals when performing a visual search test. Participants were asked to complete an independent-collectivist test to determine the tendencies for the participant's self-construal. Participants were then asked to complete a visual search test consisting of forty trials.

23 Influence of Television on Family Values

Candy Murias
(Dr. Steven Ward, Dept. of Sociology)

Mass media are among the principal social agents in many societies around the world, occupying much of our leisure and often working time. In more developed and industrialized countries such as Spain, the powerful and insistent message being transmitted by the mass media have a significant effect. For the purpose of this study I will compare the content in regards to family values on some of the most popular Spanish films from 1975-2007 and how these might compare to some of the collected statistics from the world value survey for those years.

24 The Spy in American Memory: From the Cold War to Present

Christopher O'Rielly
(Dr. Leslie Lindenauer, Dept. of History)

The world of spies and international espionage has fascinated many Americans, especially after the onset of the Cold War. Although the reality of espionage differs greatly from our perception of espionage, it is our depiction of spies in popular culture which is our focus. The qualities we attribute to spies, as well as the temporal changes in those qualities, creates an image of our own real world conflict. It is this image that will be explored.

25 Student Motivation to Learn STEM Content Through Informal Education: A Comparison Between Male and Female Students

Chantal Ridlon
(Dr. Theodora Pinou, Dept. of Biological & Environmental Sciences)

Informal education increases a student's long-term knowledge of a subject. In this study, whether an informal learning environment increases a student's motivation to learn Science, Technology, Engineering and Math (STEM) content is investigated. Students took part in a summer camp at WCSU where they completed a 30-question survey on the first and last day of the camp; the responses to these surveys provided the data. In light of the fact that women are underrepresented in these careers and research fields, this study addresses changes in female student motivation in comparison to male student motivation.

27 Encoding Proofs in a Functional Programming Language

Michael Rogowski
(Dr. Rona Gurkewitz, Dept. of Computer Science)

Many advances have been made in the study of formal proof throughout the past century. The idea that will be discussed is known as the Curry-Howard Correspondence. It relates the following: propositions and their proofs (as represented in a deductive system) and programs (as represented in some model of computation). The correspondence between the proof calculus of natural deduction and a typed lambda calculus as the model of computation will be shown.

28 Estimating Cloud Fraction over Long Island Sound for the Summer Months of 2004 using Satellite Derived Estimates of Surface Solar Irradiance

Steven Schmidt
(Dr. James Boyle, Dept. of Physics, Astronomy, and Meteorology)

The strong influence that clouds have on the Earth's surface energy budget has made measurement of cloud fraction a topic of interest in the scientific community. Because ground-based measurements of cloud fraction are limited, an emphasis has been placed on the need to use remote sensing methods. Using satellite derived estimates of surface solar irradiance in conjunction with a method for estimating cloud fraction from broadband shortwave radiometer measurements, cloud fraction estimates were produced for the summer months of 2004 over Long Island Sound.

29 Metagenomic Analysis of Microeukaryotic Organisms in Candlewood Lake

Ann Marie Selva
(Dr. Edwin Wong, Dept. of Biology)

Any invasive species entering Candlewood Lake could cause detrimental effects on the native organisms present. Cataloguing the native microeukaryotes in the lake could give insight on the state of the current ecosystem. Using metagenomic techniques such as PCR, ligation, transformation, plasmid isolation and DNA sequencing, the analysis of microscopic eukaryotic organisms was achieved. After a BLAST sequence analysis of a sample collected in August 2011, crustaceans and rotifers were found to be present.

30 Pink vs. Blue: The Effect of Gender on Color Choice

Jamie Smith
(Dr. Patricia O'Neill, Dept. of Psychology)

"Blue is for boys" and "pink is for girls" influences baby product purchases by consumers. In this study, whether specific genders actually preferred these colors is investigated. College students completed a questionnaire investigating their color preference between blue and pink. While not all results were consistent with previous findings, gender was found to have an effect on participants' color choices for specific objects. A small sample size contributed to the lack of significant results in this study.

31 Comparison of Prokaryotic Species Present in Regurgitated Pellets From Wild and Captive Great Horned Owls (*Bubo virginianus*)

Nicole Stiteler and Matthew Wimbrow
(Dr. Edwin Wong, Dept. of Biology)

We conducted an investigation examining prokaryotic organisms in the upper digestive tract of Great Horned Owls, *Bubo virginianus*, through examination of regurgitated pellets (undigested remains of the meal, i.e., bones, fur). Since owl pellet dissection is a common science experiment for young children, a knowledge base of pellet prokaryotes may be useful in determining risk of pathogen exposure. Captive owls are usually fed a controlled diet of feeder mice, while wild owls have a much more diverse diet. Genomic DNA was extracted from pellets, and prokaryotic 16S rRNA genes were sequenced to determine the identity of prokaryotic organisms present.

32 Being Proactive in Your Domain Against Cyberbullying

Melissa Telesco
(Dr. Gabriel Lomas, Dept. of Counselor Education)

A crucial difference between traditional face-to-face bullying and cyberbullying is that victims of cyberbullying do not feel that they have any safe haven or sanctuary. With face-to-face bullying, once victims go home, they are usually safe from the actions of the bully. On the contrary, cyberbullying does not necessarily stop even within the safety of the personal domain of the victim.

33 Peridomestic Risk for Lyme Disease

Karen Thompson
(Dr. Neeta Connally, Dept. of Biological & Environmental Sciences)

The blacklegged tick, *Ixodes scapularis* (aka “deer tick”), can transmit the bacterial causative agent of Lyme disease to humans. Although many people believe the highest risk for exposure to blacklegged ticks is found on hiking trails and other forested recreation areas, it has been suggested that people are exposed to ticks primarily in their own backyards. To test this, ticks submitted to the WCSU Tick Lab from regional homeowners were measured to estimate duration of attachment. Comparing attachment data with human survey information showed that nearly 3 out of 4 people were exposed to blacklegged ticks in their own yards.

34 Vulnerabilities of WCSU's Open Network to Staff and Students from Outside Attacks

Chad Yantorno
(Dr. Tudor Ivanov, Dept. of Computer Science)

This research looks at how easy it is for an outside attacker to gain access to any staff or student WCSU account by intercepting their username and password. This can be achieved through the open networkthat WCSU has implemented for connecting to the University's network. It will demonstrate how an attacker can intercept usernames and passwords from any site the victim visits once the attacker gains control of the victims' normal web browsing activity. This also demonstrates the level of security currently used to protect confidential information of staff and students.

Abstracts

Seminar Presentations

listed in alphabetical order by first author

12 Has Jazz a Future?

Matthew Hsuing
(Deborah Weisz, Dept. of Music)

Jazz is considered one of America's greatest art forms. Although the music still thrives, it has lost the popularity it once had, especially amongst today's youth. In an attempt to bring this music to a younger audience, a musical piece was composed to express a passion for jazz music through the use of multimedia. Elements of different musical styles were combined to create a more modern sound and demonstrate the art of jazz improvisation.

17 The Writing Life: A Documentary Film Featuring America's Working Writers

Sara Lewis and Kristin Santa Maria
(Dr. Brian Clements, Dept. of Social Sciences)

In the last several years the landscape of publishing has shifted dramatically. Two graduate students travelled the country in 2011 to discuss with writers how the influx of technology, self-publishing, and the democratization of literature have affected their profession. This dialogue led to a discourse on the contemporary struggle between art and commerce in a writer's life. The research will culminate in a feature-length documentary, which is currently in post-production.

26 The Middle Eastern Balance of Power: Palestine Rising

David Rogers
(Dr. Christopher Kukk, Dept. of Social Sciences)

The Middle East can be considered one of the most volatile political regions on the planet. Recent social upheaval and longstanding political and cultural conflicts have contributed to the development of a power structure that is contentious at best and lethal at worst. This presentation will focus on how the development of a new Palestinian state will affect the power structure of the Middle East.

WestConn Research Day is co-sponsored by the Office of Academic Affairs and the Admissions Office

Appreciation and thanks to the people who made this event possible:
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