



PROGRAM SCHEDULE WITH ABSTRACTS

APRIL 12, 2010
University of Mary Washington
Fredericksburg, Virginia



UNIVERSITY OF MARY WASHINGTON
IS AN INSTITUTIONAL MEMBER OF THE
COUNCIL ON UNDERGRADUATE RESEARCH
Learning Through Research



Schedule of Events

April 12, 2010

Researcher Registration 9:00 am - 10:30 am
The Great Hall

Annual Juried Student Art Show 10 am – 6 pm
duPont Gallery

Oral Sessions 10:30 am – 12:45 pm; 1:30 – 5:00 pm
Woodard Campus Center

Poster Sessions 11:30 am – 1:30 pm
The Great Hall *refreshments served for all*

Additional Exhibits and Sessions
Melchers Hall beginning at 4:00 pm
Combs Hall, Basement throughout the day





Annual Juried Student Art Show Exhibition at the DuPont Gallery 10 am – 6 pm

Jacob Argarin	Hilary Galbreath	Phoebe McMullen	Katie Rosinski
Danielle Ballinger	Maria Galuszka	Ako Nagahama	Katherine Schenck
Rachel Anne Blier	Tenee' Hart	Alanna Neal	Lauren R. Scott
Elizabeth Bradley	Lauren Horton	Erin O'Donovan	Adriana Louise
Tess Buccigrosso	Erin Kohler	Anna Prezioso	Serrato
Ashleigh Buyers	Meredith Langer	Kimberly Quarforth	Minta Smith
Allyson Childress	Sarah Lapp	Samantha Rizzi	Rachel Zeiler
Julian Reese Ensign	Katie Matusik	Meredith Roane	Ginna Zell



Sessions in Melchers Hall

4:00-5:30 MELCHERS 107

Joseph Di Bella, Chair

- Coticchio, Ashley. "Contrasting Textures: A Presentation for Honors in Studio Art." (Joseph Di Bella and Lorene Nickel)
- Holljes, Sarah. "Capturing the Gift: A Presentation for Honors in Studio Art." (Joseph Di Bella and Lorene Nickel)
- McMullen, Phoebe. "Memories of Family: A Presentation for Honors in Studio Art." (Joseph Di Bella and Lorene Nickel)
- Quarforth, Kimberly. "Themes of Veneration: A Presentation for Honors in Studio Art." (Carol Garmon and Lorene Nickel)
- Woll, Hannah. "Stereotypical Labels: A Presentation for Honors in Studio Art." (Lorene Nickel)

4:00-6:00 MELCHERS 207

JeanAnn Dabb, Chair

- Ain, Melody. "The Woman's Building and Its Influence on Performance Art." (Marjorie A. Och)
- Austin, Davida. "A History in Limbo: The Repatriation of Egyptian Artifacts." (JeanAnn Dabb)
- Berkowitz, Sara. "Tormented Erotica: The Life and Art of Hans Bellmer." (Joseph G. Dreiss)
- Boyce, Danielle. "The Conservation of Leonardo's Last Supper." (JeanAnn Dabb)
- Cutrona, Jennifer. "The Open Plan." (Joseph G. Dreiss)

Sack, Emily. "Frank Gehry's Guggenheim Bilbao." (Joseph G. Dreiss)



Exhibit: Combs Hall, Basement

INTERPRETING SLAVE HOUSING: AN EXHIBITION

Douglas W. Sanford, Organizer and Chair

Allison Campo

Luan Cao

Christina Estep

Elizabeth Fedowitz

Kathleen Haver

Katherine Hummelt

Adrian Lesiuk



Oral Sessions – Woodard Campus Center

10:30-11:30

Meeting Room 1, Judith A. Parker, Chair

Deasy, John. "AC Magnetic Fields." (George King, III)

Gallasch, Ryan. "Elections in Fredericksburg." (Leslie E. Martin)

Longerbeam, Anne. "The Effect of Syntax on Attitudes toward Domestic Violence Victims." (Judith A. Parker)

Mattos, Justin. "Fighting Racism Through Pleasantries and Pedagogy: The Civil Rights Movement Comes to Mary Washington Part II." (Jeffrey W. McClurken)

Meeting Room 4, George R. Meadows, Chair

McTernan, Melissa. "The Role of Impulsivity in a Moral Decision Making Model." (David A. Rettinger)

Rowell, Kirsten. "The Effect of Concept Mapping Software on 3rd Grade Writing." (George R. Meadows)

Sciequan, Diamond and Shewark, Elizabeth. "Depression and Motherhood: Are Women with Postpartum Depression Good Mothers?" (Christine A. McBride)

Red Room, Carole Ann Creque, Organizer and Chair

Fehrman, John

Scott, Diana

Hall, Amanda

Menge, Jennifer

Johnson, Michael

Proffit, Jonathan and

O'Neil, Lauren. "Case Study Chick-fil-a." (Carole Ann Creque)

11:45-12:45

Meeting Room 1, Andrea L. Smith, Chair

Corcoran, Chelsea
Dinndorf, Helen
Hall, Megan
Moore, Sarah
Pieper, Bill and
Travers, Bridget. "How Luddites Can Design a Website." (Andrea L. Smith)
Sam Krieg. "Como un cometa minúsculo: Octavio Paz and Surrealism." (Shara Voisard)
Genine Geissler. "El Teatro Campesino and the Chicano Brown Power Movement."
(Elizabeth F. Lewis)

1:30-2:30

Red Room, Jennifer A. Polack-Wahl, Organizer and Chair

McElhannon, Jeff;
Adams, David;
Hamerski, Kevin; and
Herold, Tyler. "Developing Apple iTouch Education Applications for Hartwood
Elementary."
(Jennifer A. Polack-Wahl)
Gallagher, Jimmy;
Reichert, David; and
Willless, Sean. "Helping UMW Departments by Creating Data-Driven Website." (Jennifer A.
Polack-Wahl)

Meeting Room 1, Debra C. Steckler, Chair

Bernat, Elizabeth. "Analysis of Temperature Change Using a Mathematical Model."
(Jangwoon Leo Lee)
Chaplin, Courtney;
Caitlin Dail,
Ariel Place, and
Megan Tisdelle. "The Face of Facebook: Facebook Use and the Recognition of Universal
Facial Expressions." (Debra C. Steckler)
Clemmer, Aaron. "Functional Programming in Haskell." (Marsha F. Zaidman)

Meeting Room 2, Holly H. Schiffrin, Chair

Yantis, Caitlyn. "The Influence of Film-Induced Affect on the Remote Associations Task."
(Holly H. Schiffrin)
Sleeman, Allison;
Tuhy, Elinor;
Yantis, Caitlyn; and
Zupko, Eric. "The Impact of Affect on Cognitive Processes." (Holly Schiffrin)
De Graffenreid, Alexandra. "Digital History: The James Monroe Papers." (Jeffrey W.
McClurken)

Meeting Room 4, Kenneth D. Machande, Organizer and Chair

Hoffman, Scott;
Yannopoulos, Amanda and
Reed, Jr, Charles. "Legislative Effects on Economic Opportunities for Women: Title IX's
Impact on the Corporate Board Room in the United States." (Kenneth D. Machande)

SPECIAL TIME 2:00-3:00 Red Room

Mary Washington: Digital History of the Woman and the School

Jeffrey W. McClurken, Organizer and Chair

Donnelly, Caitlin;
Stephanie Lefferts,
Kari Wilson and
Jenn Arndt. "The life and legacy of Mary Ball Washington." (Jeffrey W. McClurken)

Levine, Cary;
Mary Ann Mackey,
Megan Whiteaker, and
Jonathan Wigginton. "Mary Washington's Images throughout the Years." (Jeffrey W. McClurken)

2:45-3:45

Meeting Room 1, Stephen C. Davies, Organizer and Chair

Aylor, Stacey. "Interactive Database Design." (Stephen C. Davies)
Zeit, Jessica. "Addressing the Cognitive Difficulties of Expressing N-ary Relations in Semantic Web Data." (Stephen C. Davies)
Donaher, Chris and
Hatfield, Jesse. "User Interface Design Considerations for Semantic Web Authoring Environments." (Stephen C. Davies)

Meeting Room 2, Paul D. Fallon, Chair

Klein, Dayna;
Van Orden, Tammy;
Asbell, Robin; and
Herman, Teresa. "Educational Attainment: A Predictor of Juvenile Delinquency and Adult Offender Recidivism." (Debra J. Schleaf)
Kollman, Kathleen. "A Qualitative Study of English Language Instruction in Spanish Schools in Response to Education Changes." (Paul D. Fallon)
Allan, Laura. "Refugees in Fredericksburg, Va: Community Interaction and Assimilation." (Leslie E. Martin)

Meeting Room 4, Tracy B. Citeroni, Organizer and Chair

Burke, Jeremy. "Men in Tights, On the Ropes: How do male athletes within variously gendered sports negotiate masculine identities?"
Gallasch, Ryan. "'Benching' at UMW: An Observational Culture on Campus Walk."
Klein, Dayna. "The Facilitation of Social Service Programs as Experienced by First-Time Users in Central Virginia."
Smith, Caitrin. "Bringing Your Class to Class: How do UMW students understand and experience their own and others' social class status on campus?"

4:00-5:00

Red Room, Session dedicated to the legacy of Dr. James Farmer

Jess M. Rigelhaupt, Organizer and Chair

Lauer, Christiane. "James Farmer to a Friend: A Fear of Being Forgotten."

Murphy, MacKenzie. "When More Could Have Been Done: How Theory Plays into an Oral History Interview."

Mattos, Justin. "Professor James Farmer at Mary Washington College: An Administrative Perspective."

Meeting Room 1, Elizabeth F. Lewis, Organizer and Chair

Mattos, Justin. "The Depiction of Racial Discrimination Against Afro-Cubans in Cuba and the United States in *The Maids of Havana*." (Ana Garcia Chichester)

Ailstock, Barbara. "The Impact of Cultural Elements in Commercial Translation." (Marisa Martinez-Mira)

Markiewicz, Holly. "The Effects of Graphic Organizers in Spanish Reading Comprehension for High School Students of Spanish as a Second Language." (Marisa Martinez-Mira)

Walker, Elisa. "*Yerba mate*: A Window into Argentine Culture and History." (Elizabeth F. Lewis)

Meeting Room 2, Neil E. Tibert, Chair

Cousineau, Lyssa. "Growth History and Climate Seasonality of the Eastern Oyster Collected from Shell Middens at Westmoreland, Virginia." (Neil E. Tibert)

Downey, Michael. "Micro-simulation of intergenerational wealth." (Robert S. Rycroft)

Milner, Lauren;

Taylor Brann,

Katelyn Lease, and

Megan McMillan. "Fredericksburg: City of Hospitals." (Jeffrey W. McClurken)



Poster Sessions – Great Hall

11:30 am – 1:30 pm

Almahdali, Sarah.

"Chemical Modification of Diverse Electrode Materials." (K. Nicole Crowder)

Baardsen, Erika & Wang, Borwyn, "The Isolation and Identification of a New *Caenorhabditis* Species to be used in Comparative Genomics." (Theresa M. Grana)

Bogdanow, Anya.

"Monitoring the Kokaral dam's effectiveness in preserving the smaller Aral Sea." (Brian R. Rizzo/Peter Chirico)

Burruss, Benjamin.

“Physical and Photochemical Characteristics of Fractionated NOM.” (Charles M. Sharpless)

Cohen, Caitlin. “STM investigation of brominated organics on graphite.” (Leanna C. Giancarlo)

Cooper, Olivia. “Anthropogenic and Climate Forcing on Sedimentation in the Potomac Estuary.” (Neil E. Tibert)

Cross, Miriam. “Geospatial Analysis of Salamander Survey in Culpeper and Fauquier Counties Virginia.” (Ben O. Kisila)

Detweiler, Zachary. “Analysis of Estrogen Content in Bovine Milk.” (Kelli M. Slunt)

Gavigan, Brianna.
“Is the Portrayal of Child Care in Sitcoms Truthful?” (Debra J. Schleef)

Hillyard, Jonathan
“Characterization of the Per1 Gene Promoter Using Chromatin Immunoprecipitation.” (Deborah L. Zies)

Huxtable, Caitlin
“Practices, Perceptions, and Exposure of Citizens Regarding Hazardous Household Wastes.” (Melanie D. Szulczewski)

Jones, Emma
“Paleoenvironmental Record of Climate and Anthropogenic Modifications to the Potomac Estuary.” (Neil E. Tibert)

Kidder, Jessica
“The Effects of Acid Mine Drainage on Macroinvertebrate Diversity and Abundance in Contrary Creek, Louisa County, Virginia.” (Charles E. Whipkey and Abbie M. Tomba)

Lescault, Tara A
“Juliet’s Party Dress from Romeo & Juliet” (Kevin J. McCluskey)

Love, Patrick
“Risk, reward, impulsivity, and social presence: Measuring their interaction and their effects on academic cheating.” (David A. Rettinger)

Magruder, Matthew
“Application of 210Pb isotopic fingerprinting to identify sources of sediment and erosion rates in local watersheds.” (Ben O. Kisila)

Matta, Kate
“Diversity of Riparian Vegetation and Downstream Distribution of Yellow Water Lily in a Tidal Wetland System Prior to Dam Removal.” (Alan B. Griffith)

Miles-McLean, Haley
“Developing the Protocol for an Allelopathy Laboratory.” (Stephen W. Fuller)

Mulrey, Clare
“The effects of atrazine on gene expression of appetite-regulating neurohormones in zebrafish, *Danio rerio*.” (Dianne M. Baker)

Nathan, Stacey

“Surface Modification of Ti-6Al-4V: A Biomimetic Approach for Orthopedic Implant Applications.” (K. Nicole Crowder)

Ney, Sarah

“Analysis of Alarm Chemicals in the Freshwater Crayfish, *Orconectes rusticus*.” (Abbie M. Tomba)

Pope, Ian

“Soil Erosion and Sediment Flux: A Watershed Study of the Ni Reservoir, Spotsylvania County, Virginia.” (Ben O. Kisila)

Rickard, Laura

“Coupling Losses in Optical Fiber Transmissions.” (George King, III)

Sanders, Houston

“DC Magnetic Fields.” (George King, III)

Spengler, Nina

“Identification of *Staphylococcus aureus* on computer keyboards at UMW.” (Lynn O. Lewis)

Thompson, Allyson

“Change Detection in the Marange Diamond Fields of Zimbabwe.” (Brian R. Rizzo)

Walker, Lindsay

“Climate Forcing and Anthropogenic Influence on Sedimentation for the Rappahannock Estuary in the Chesapeake Bay Watershed.” (Neil E. Tibert)

Williams, Jonathan S.

“Exploring Direct Photolysis Mechanisms of Polycyclic Aromatic Hydrocarbons (PAHs) in Non-polar Solvents.” (Charles M. Sharpless)

Yoon, Sunnan & Pilati, Laura

“Comparative Analysis of the Environmental Evolution of two Virginia Lakes: Lake Pelham and Lake Moomaw.” (Ben O. Kisila)



Abstracts

Listed Alphabetically By Student Researcher

Ailstock, Barbara

Modern Foreign Languages

Faculty Sponsor: Marisa Martinez-Mira

The Impact of Cultural Elements in Commercial Translation

In the translation of different types of documents there exist several external factors that can impact the way in which the translated document can be interpreted by the target audience. In the case of a commercial document this could lead to the loss of potential clients if not carried out successfully. In order to avoid confusing or even offensive errors, many companies adapt their texts to the society and culture of the intended public. This study seeks to identify how various cultural elements, when applied to the process of translation, impact the interpretation of the commercial document. In order to examine their effect three types of documents were examined for two companies: Clorox and Nestlé. It was decided that a case study would function best in this instance since it allowed for a more profound analysis of the texts in question. Through this analysis we are able to gain valuable insight into how the two distinct strategies of translation and cultural adaptation have enabled these companies to thrive in the global market

Ain, Melody

Art History

Faculty Sponsor: Marjorie A. Och

The Woman's Building and Its Influence on Performance Art

This presentation focuses on the development of the Woman's Building in Los Angeles from its creation in 1973 through the end of this decade. The Woman's Building was an institution that centralized feminism by providing a physical location for women's culture and arts. Women had previously lacked a center such as this, and the educational programs and gallery spaces the Woman's Building offered, such as the Feminist Studio Workshop and the Womanspace gallery, gave women an unusual opportunity to develop themselves as feminists and as artists. Many performance artists were educated at the Woman's Building, and used the fundamentals learned during their experiences there to expand their art later in their careers. The Woman's Building gave women a space to discuss themes that had never been spoken about before, and many artists integrated these dialogues within their art. Suzanne Lacy and Leslie Labowitz's 1977 "In Mourning and In Rage" is one example that shows a direct influence of the ideologies taught at the Woman's Building. The strength and hope portrayed during this performance exemplified what feminism wanted to accomplish during this decade and what the iconic Woman's Building stood for. The history of women's art was just being uncovered and rediscovered at this time, and the emotional energy of these women exemplifies the spirit of the entire decade.

Allan, Laura

Sociology

Faculty Sponsor: Leslie E. Martin

Refugees in Fredericksburg, Va: Community Interaction and Assimilation

This study was conducted in an attempt to gain a more comprehensive understanding of the refugee population around the world and make specific generalizations about the refugees who have been placed in the Fredericksburg, Va region. To do so, I began with a qualitative assessment of worldwide trends of refugee resettlement and migration. This provided me with a general pattern of refugee behavior and allowed me to work towards my eventual goal of understanding assimilation among refugees and the dynamics of community involvement/ interaction. Next, I looked at articles from the Free Lance Star and several other local newspapers. Here I began to focus on more individual and local instances of refugee resettlement as I read about specific experiences and instances that have taken place in Fredericksburg. Finally, I conducted observations of three refugee girls in an after school program. Through these three segments it has been discovered that a moderate level of refugee assimilation exists despite the fact that community interaction and involvement with non- refugees among refugees is limited. This is possible because our system works to integrate refugees in many institutions, such as in the workplace and at school so that individual, choice-based community interaction may be minimal, yet assimilation still occurs.

Almahdali, Sarah

Chemistry

Faculty Sponsor: K. Nicole Crowder

Chemical Modification of Diverse Electrode Materials

This research project aims to develop chemically modified electrodes to catalyze the reduction of carbon dioxide gas to useful carbon-carbon molecules. The electrode will be modified by covalently binding a known transition metal-based electrocatalyst to its surface through either a thiol or phosphonate group. Doing so should increase the catalyst's efficiency and decrease the time and cost needed to recover the catalyst from the reaction.

The type of surface modification used depends on the electrode material, either noble metals or metals with stable oxide layers. Compounds with thiol functional groups can spontaneously form monolayers on the largely unreactive noble metals. Phosphonic acids form phosphonate compounds on electrodes with stable oxide layers. We can utilize these reactions by synthesizing a compound with thiol or phosphonate on one end and a electrocatalyst on the other. With both types of electrodes, the catalyst is either attached after synthesizing the appropriate compound or the appropriate compound is built upon the electrode.

Austin, Davida

Art History

Faculty Sponsor: JeanAnn Dabb

Title: A History in Limbo: The Repatriation of Egyptian Artifacts

The justification of ownership of cultural property has been a long-standing and highly contentious debate among international museums and throughout the art market. At its forefront, Dr. Zahi Hawass, Secretary General of the Supreme Council of Antiquities in Egypt, has waged a global media battle with several major museums over artifacts that he believes were removed illegally from Egypt. In my individual study, I analyze Dr. Hawass' efforts in the repatriation of a selection of Egyptian artifacts, and the legal and ethical issues surrounding the provenances of these objects. My study draws into question the legitimacy of institutional claims to ownership of culturally significant objects and seeks to provide a sound platform for further discussion of this ongoing conflict.

Aylor, Stacey
Computer Science
Faculty Sponsor: Stephen C. Davies
Interactive Database Design

A new interactive database interface paradigm is being developed for “category-based browsing.” With current database technology, users can ask concrete questions like “How many movies that Steven Spielberg directed grossed over \$50 million?” But there is no venue for users to ask abstract questions based on categories they envision, such as “How many 'chick flicks' grossed over \$50 million?” where “chick flicks” is a category of the user's own devising. This new interface allows a user to find an answer to such a question. A user defines a particular category by giving examples and counterexamples, and the system can use those answers to predict other items that are members of the category. It allows non-technical users to explore the contents of a database where categories are not concretely defined, but change for each user through the use of an active learning algorithm and a carefully selected statistical rater. Using the Internet Movie Database's data, users can visually discover facts and statistics about categories that they create. Users will begin with a blank canvas where they can create categories and add movies to their canvas. Clicking on a category or film reveals data (e.g. box office earnings, month released, mpaa rating) about that object in a statistics pane. Links can be made between entities to explore relationships between them. The user can interact with categories and movie information in a way not currently offered anywhere else. This presentation gives an overview of existing research efforts in information visualization and categorization, features a live demo of the prototype tool, and presents empirical findings evaluating its effectiveness.

Baardsen, Erika & Wang, Borwyn
Biology
Faculty Sponsor: Theresa M. Grana
The Isolation and Identification of a New *Caenorhabditis* Species to be used in Comparative Genomics

Caenorhabditis elegans is a model organism that provides researchers with an invaluable resource for studying developmental genetics. Its completed genomic sequence has enabled the discovery of many developmental pathways that aid in research of development in other multi-cellular organisms, including humans. However, there are many mechanisms and pathways that have yet to be annotated using *C. elegans* as a model organism. Missing information regarding genomic sequences can be elucidated by comparison to a sister species. There is currently no known nematode species closely related to *C. elegans*. This study acknowledges the need to isolate and identify a new *Caenorhabditis* species that will clarify the role of gene sequences collected from *C. elegans*. Four strains of nematodes have been isolated from the Fredericksburg area. Four-dimensional imaging of recently isolated adult nematodes suggest that their internal structures differ from *C. elegans* and that they may be sister species. Structures of interest include the tail region, pharynx, and vulva. Molecular sequencing to identify isolated strains will be used for more detailed comparison.

Berkowitz, Sara
Art History
Faculty Sponsor: Joseph G. Dreiss
Title: *Tormented Erotica: The Life and Art of Hans Bellmer*

Hans Bellmer is known for some of the most violently erotic and disturbing works of art from the modern era. In my individual study, I have explored the personal and political events, and previous artistic influences that have inspired the creation of Hans Bellmer's controversial *Doll*. My final presentation will discuss Hans Bellmer's early

history and influences. These include his childhood, the Nazi occupation of his homeland of Germany, his move to France, and the French Surrealists. I focus on his writings from *The Doll* and *Games of the Doll*, his material construction, and the accompanying photographs. I present an account of Bellmer's second construction of *The Doll*, his erotic drawings, and the important figures in his life, including his cousin Ursula, who introduced him to Andre Breton, and his partner Unica Zurn. I conclude with arguments from prominent scholars on Bellmer from the Feminist and Freudian perspectives. In my assessment of the art Hans Bellmer, I differ from scholars of these schools in that I believe we, as viewers and critics, cannot ignore the inherent eroticism and violence in Bellmer's work. Only through building a larger context can we create a more informed platform on which to view it.

Bernat, Elizabeth

Mathematics

Faculty Sponsor: Jangwoon Leo Lee

Analysis of Temperature Change Using a Mathematical Model

In this project, we use the steady-state heat equation to analyze the temperature changes in a rectangular domain. We solve this equation mathematically using the method of separation of variables and computationally using the finite difference method with several different iterative schemes. We prove the convergence of our numerical method with appropriate assumption on a parameter. Finally, we present some numerical results for our mathematical model and its finite difference equation so that we can see how the solutions change as we alter input data such as relaxation parameters, grid sizes, and stopping criteria.

Bogdanow, Anya

Geography

Faculty Sponsor: Brian R. Rizzo

Monitoring the Kokaral dam's effectiveness in preserving the smaller Aral Sea

The Aral Sea lies in the middle of steppes and desert between Kazakhstan in the north, and Uzbekistan in the south. It is fed by the Amu Darya and Syr Darya rivers. Since the 1960s, the once 4th largest lake has experienced large changes in size and water content. The reasons are the large irrigation projects performed by the Soviets. Today, the surrounding population faces the challenge of preservation, and has turned to international support. Hoping to save the small northern Aral, the World Bank has completed the Kokaral dam in 2005 which prevents water from flowing off to the south. This project aims to show how the World Bank's efforts have succeeded.

According to the numbers, the lower lake is by far the largest in area. In 1999 it will have shrunk by a dramatic amount, and in 2009 the lake has decreased the largest amount.

In comparison, the numbers of the upper lake show, that the upper lake is largest in 2009, closely followed by 1999 which is closely followed by 1989. The lake experiences little change in all three years in the upper lake.

Boyce, Danielle

Art History

Project Supervisor: JeanAnn Dabb

The Conservation of Leonardo's Last Supper

Debates on the conservation of artwork are not uncommon occurrences, even more so when the work of art is as famous as Leonardo's "Last Supper" in the refectory of Santa Maria delle Grazie in Milan, Italy. The individual study that I have conducted over the course of this semester is based on the most recent conservation project on the "Last Supper"; a twenty-year-long effort starting in the late 1970s with chief conservator Pinin Brambilla Barcilon heading the project. The mural had been rapidly disintegrating

since its completion in 1498 and was made worse by subsequent restorers who tried to match Leonardo's hand. The goal of the 1970s conservation project was to save what was left of the original work and preserve it for future generations. The question though is, should it have been done? Throughout the course of my research I have investigated the history of the painting and the details of the conservation efforts for a better understanding of the decisions that have been made regarding the preservation of the "Last Supper" and the goals to insure its future existence.

Burke, Jeremy

Sociology

Faculty Mentor: Tracy B. Citeroni

Men in Tights, On the Ropes: How do male athletes within variously gendered sports negotiate masculine identities?

The purpose of this project is to investigate how male athletes perform masculinities within their chosen sport(s). Men in dance and basketball, for example, face different expectations in regards to their gender identities and behaviors. I situate my work within the tradition of gender scholars who seek to understand the multiple and conflicting ways in which masculinities are forged in specific empirical contexts. My research may help shed light on what constitutes popular conceptions of the male athlete and how individual men construct their own identities in relation to them. I am particularly interested in men who creatively construct oppositional identities which resist/challenge the limits of mainstream masculinities in sport. The two groups highlighted in my study are male dancers and participants in a range of college sports. I have utilized formal and informal interviews, participant observation, autoethnography, and a focus group to generate data on men's experiences in various athletic contexts. My preliminary findings reveal several distinctions between the experience of a male dancer and an athlete in a different sport in terms of how each defines and performs their masculine identity. As important as the differences between dancers and others, I also encountered a meaningful stratification within the groups as well.

Burruss, Benjamin

Chemistry

Faculty Sponsor: Charles M. Sharpless

Physical and Photochemical Characteristics of Fractionated NOM

Natural organic matter (NOM) originates from the degradation of plankton and vascular plant matter residues in natural waters and sediments. Humic substances (HS) represent a slowly-degrading fraction of the NOM, and HS are often isolated and studied to determine their photoreactivity. Upon absorbing sunlight, HS react with molecular oxygen to produce an unstable and reactive form of O₂, singlet oxygen, which is capable of destroying organic pollutants in water. Previous studies have shown relationships between the molecular size, light absorption properties, and photoreactivity of HS, but the exact reasons for this are unclear. In this study, we isolated two HS fractions from soil: humic acid (HA) and fulvic acid (FA). For FA and HA samples and a whole water (WS) sample the apparent molecular weights were determined by high-performance size exclusion chromatography, and the absorption spectra were measured to calculate E₂/E₃ ratios, the absorbance at 254 nm divided by that at 365 nm. Previous researchers have shown an inverse correlation between molecular size and E₂/E₃ ratios. This relationship was observed between the FA and HA fractions but not WS. Photochemical production of singlet oxygen (¹O₂) was also measured, and the rate of its production was inversely related to molecular size.

Chaplin, Courtney; Caitlin Dail, Ariel Place, Megan Tisdelle

Psychology

Faculty Sponsor: Debra C. Steckler

The Face of Facebook: Facebook Use and the Recognition of Universal Facial Expressions

The purpose of this study is to explore whether active use of the social networking site Facebook affects the user's ability to distinguish between and react to the six universal facial expressions. The relationship between Facebook use and Eysenck's conceptualization of introversion/extroversion was also explored. Forty-seven participants from the University of Mary Washington participant pool were used in this study. Each participant took the Eysenck's Personality Questionnaire, filled out a survey asking them to report the amount of time they spend on Facebook each day, and responded to thirty-six photos depicting the six universal facial expressions on a computer program called PEAK. Using PEAK, participants used the numbered keys 1-6 to identify which universal facial expression they thought each of the thirty-six pictures represented, as they appeared individually on the screen.

We predict that participants will be faster at recognizing happiness than they will any of the other five universal facial expressions. This is based off of the observation that happiness is the facial expression seen most often in the photos that are shown on Facebook. We also hypothesize that participants that are considered to be very introverted or very extroverted according to Eysenck's scale will spend more time on Facebook than those who fall in the middle of Eysenck's scale.

Clemmer, Aaron

Computer Science

Faculty Sponsor: Marsha F. Zaidman

Functional Programming in Haskell

The goals of this individual study were twofold. The first goal was to investigate and develop a proficiency in functional programming methodologies and applications using the Haskell language. The second goal was to create a report that synthesized existing research on the challenges in teaching the functional paradigm with the student's own experience in learning it over the course of the study. There were three milestones for the project. The first milestone was to gain practical programming ability in Haskell in support of the subsequent milestones. The second milestone was to learn about functional concepts and idioms such as recursion, higher-order functions, lazy evaluation, continuations, mapping and folding, and closures. The third milestone was to undertake a programming project of significant but feasible scope which sought to apply what was learned during the earlier milestones. The project chosen was to implement a file compression and decompression program using the Huffman coding algorithm. This choice was revealing, as it exposed both the strengths of a purely functional language in quickly and expressively implementing algorithms as well as its weaknesses in areas such as I/O interactions and performance traceability.

Cohen, Caitlin

Chemistry

Faculty Sponsor: Leanna C. Giancarlo

STM Investigation of Brominated Organics on Graphite

The physisorption of brominated organic compounds on metal and semi-conductor substrates was investigated through Scanning Tunneling Microscopy. Two brominated alcohols, 11-bromoundecanol and 12-bromododecanol, were dissolved separate solutions of phenyloctane and undecanol solvents. These solutions were deposited and scanned on graphite (HOPG). A STM tip of Pt/Rh (83/17) was used with a set point current of .300nA and a bias voltage of 1.450V, and images of 11-bromoundecanol in phenyloctane were obtained; these showed rotator phase transitions (60 degrees) about the packing angle at the hydrogen bonded hydroxyl groups. Images of 12-bromododecanol were not isolated on the graphite which suggest a chain length effect on the orientation of the terminal groups and the ability of the molecules to organize into lamellae. The use of undecanol as a solvent caused problems with the stability of the current, or the ability of isolating the tunneling current from

the faradaic current. Coating the STM tip with an insulating material like a wax could be a viable solution. A separate study was performed for the comparison of different substrates, HOPG and molybdenum disulfide, where HOPG provides a higher resolution image because it is metallic and has a more uniform surface while MoS₂ is a semiconductor with macroscopic surface flaws.

Campo, Allison; Cao, Luan; Estep, Christina; Fedowitz, Elizabeth; Haver, Kathleen; Hummelt, Katherine; and Lesiuk, Adrian

Historic Preservation

Faculty Sponsor: Douglas W. Sanford

Interpreting Slave Housing: An Exhibition

An exhibition entitled “Interpreting Slave Housing” derives from a student group research project (students are enrolled in HISP 491: Individual Study) centered on the documentation and interpretation of housing for enslaved African Americans in Virginia. This project developed out of a recent National Endowment for the Humanities grant directed by Prof. Sanford on the same topic. Students in the course have conducted field recording of surviving slave-related buildings in different counties, generating systematic information (field notes, digital photographs, measured drawings) that will be posted to a public website. In addition, students are examining period documents, namely census records that contribute to our understanding of patterns of slave ownership, housing, and household composition. The exhibition will address the general subject of slave housing (typical patterns of construction and placement on the landscape); current scholarship for this portion of African American history and culture; and, the public interpretation of slavery and slave housing in America.

The exhibition, comprised of images and text on a wall, will be located in the basement level of Combs Hall.

Cooper, Olivia

Earth and Environmental Sciences

Faculty Sponsor: Neil E. Tibert

Anthropogenic and Climate Forcing on Sedimentation in the Potomac Estuary

Paleoenvironmental changes in the Potomac estuary during the last 200 years were forced by climate changes and anthropogenic activity in the Chesapeake Bay Watershed. Ostracodes are calcareous crustaceans that are sensitive to temperature and salinity changes. Specifically, the pores in the shells of some species yield differing shapes whereas round pores indicate lower salinity. A sediment core of estuarine mud was collected from the mouth of the Potomac Creek near Fairview, Virginia. Census counts of the ostracodes demonstrate alternations between brackish and marine taxa up core. *Cyprideis salebrosa* is relatively abundant in the 130-70 centimeter interval and *Cytheromorpha fuscata* is relatively abundant in the 70-36 centimeter interval. The uppermost 36-0.0 cm interval yields a distinctly freshwater taxon (*Darwinula stevensoni*). Pore shapes for *Cyprideis salebrosa* were determined using pore morphometry on the Scanning Electron Microscope (SEM). Irregular pore shapes characterize intervals dominated by the marine species *Cytheromorpha fuscata*, which we interpret as 15-34 parts per thousand (ppt) salinity (mesohaline). Round pores are most common when ostracode populations are dominated by *Cyprideis salebrosa* which we interpret as brackish conditions (5-15 ppt). Overall, the core documents marine and brackish alternations that likely correspond to decadal climatic changes in the region. The gradual freshening upward trend as a result of industrial and agricultural land use practices in the watershed that have contributed to increased fluvial influence in the region.

Coticchio, Ashley

Art History

Faculty Sponsors: Joseph Di Bella and Lorene Nickel
Contrasting Textures: A Presentation for Honors in Studio Art

My focus is the contrast of textures, both in painting and ceramics, and how this contrast represents the combating forces of my life and surrounding environments. Recognizing the presence of change in the world and how this affects all things, I work with materials without a preconceived notion in order to let the nature of the materials be influential. This flow in turn represents naturally occurring change. In looking for objects to incorporate, I tend to select those that are rich but have unknown histories, such as sea glass or found objects. I then take these objects and further their journey by continuing their change in their use and physical characteristics. I explore a variety of characteristics, ranging from wild and expressive marks to smooth and subtle forms. These aspects draw from the single idea that I am currently finding my true self and place, both as woman and artist. So consumed by my change, I cannot help but express and mirror it artistically. By depicting my changes, I seek the viewer to do the same as it pertains to their own life and constant state of change.

Cousineau, Lyssa
Earth and Environmental Sciences
Faculty Sponsor: Neil E. Tibert
Growth History and Climate Seasonality of the Eastern Oyster Collected from Shell Middens at Westmoreland, Virginia

The Chesapeake Bay has seen a significant loss of oyster reef habitat since the Industrial Revolution. The demise of the fishery is largely thought to reflect anthropogenic changes in sedimentation and nutrient loading in the region. Stratford Hall Plantation in Westmoreland County, Virginia has been the focus of years of archaeological investigation such that the middens of the plantation have yielded several dozen specimens of the Eastern oyster, *Crassostrea virginica*. Artifact-dated archaeological deposits from the colonial plantation in the Northern Neck region of Virginia, therefore, have the potential to provide a Colonial seasonal climate record for the Chesapeake Bay region.

New sclerochronologic techniques using the variable pressure Scanning Electron Microscope allow for an unprecedented seasonal and weekly growth record. Twenty-seven oysters excavated at the Stratford Hall site, were carefully selected on the basis of pristine preservation to include 100% shell completeness and minor evidence for physical and chemical abrasion. By observing the internal umbo of the larger valve, we've determined that the average age of the samples is approximately six years. In general, most oysters demonstrate a reduced growth rate with increasing age. The highest rates of growth correspond to the intervals April to September which suggest highly productive spring through summer conditions on the oyster reefs in the Colonial Potomac Estuary.

Cross, Miriam
Earth and Environmental Science
Faculty Sponsor: Ben O. Kisila
Geospatial Analysis of Salamander Survey in Culpeper and Fauquier Counties Virginia

The sudden and rapid decline of amphibian populations all over the world is both alarming and well documented. It is an issue raising concerns about climate change as well as anthropogenic habitat destruction on a global scale. Many amphibians are environmental indicators and keystone species making their mass extinctions a particularly sinister warning. Areas of wildlife management in the United States are beginning to pay close attention to their populations of amphibians. Practical, cost effective, and efficient management practices are needed to monitor population dynamics of concerned amphibian species. These findings need to be merged with information about the environmental conditions that exist within a habitat.

This study uses Geographic Information Systems to analyze and present the results of a salamander survey in C.F Phelps Wildlife Management Area in Culpeper and Fauquier counties Virginia. Maps show both the abundance of red-backed salamanders, *Plethodon cinereus*, and environmental variation in soil pH, drainage, land use, soil type and organic matter all of which may be of concern to the population. Statistical analysis will be used to verify the relationship between the above listed variables and the abundance of red-backs. This information is meant to be part of an ongoing amphibian-monitoring program in the wildlife area. The GIS databases created can be used and built upon future surveys in the area. If researchers and wildlife managers hope to understand what the status of amphibians and their habitat is, GIS studies like this will be an asset for long-term studies and the creation of management programs.

Cutrona, Jennifer

Faculty Sponsor: Joseph G. Dreiss

The Open Plan

The purpose of this individual study project is to explore the history and theory behind what is probably the single most iconic, recognizable and influential of all 20th century designs for interior space, i.e. the open plan. The open plan was a new and innovative way to design interior space. It was introduced by Frank Lloyd Wright in architecture and Piet Mondrian in painting. These two artists greatly influenced Ludwig Mies van der Rohe. His Barcelona Pavilion, which he designed in 1929 is the greatest and most important example of the open plan. It was designed to represent the cultural values of Germany and separate it from its tainted past. Wright, Mondrian, and Mies van der Rohe all believed that society and the individual could be greatly influenced by art and architecture and all three strove to design paintings and buildings that would create this change. The solution they thought would best expedite this was the open plan. In this individual study paper, I intend to expand upon my understanding of modern architecture as motivated by utopian ideals and particularly how the innovative design known as the open plan was intended to transform individual psychology and in so doing help make the realization of modern architecture's social and political agenda a reality.

Deasy, John

Physics

Faculty Sponsor: George King, III

AC Magnetic Fields

Time varying magnetic fields or more specifically alternating current magnetic fields are the product of a time dependent current. These types of magnetic fields are both consequences and necessities of our technology. Today, the use of technology produces varying magnitudes of AC magnetic fields. The devices that utilize these fields range from small cell phones to transformers for massive transmission and distribution power lines. For example, a large enough AC magnetic field from a switchgear, which distributes power throughout an industrial building, has the potential to cause serious, if not fatal, harm to an individual reliant on medical implants that use electric pulses to maintain the vital functions of the heart and the brain. These sinusoidal fields can interfere with medical implants in such a way to cause them to malfunction or even shut down. On the other hand, the operation of a transformer, a device that converts power from high voltage to a lower voltage or vice versa, completely depends on the magnetic field produced by magnetic induction. Without the ability to manipulate voltage in this manner, many of the portable handheld devices used could not be recharged as easily and efficiently. During the course of this study, the time varying magnetic fields in a typical Mary Washington Classroom are investigated.

deGraffenreid, Alexandra; Wright, Chris; Murphy, MacKenzie; and Mintzer, Seth

History

Faculty Sponsor: Jeffrey W. McClurken

Digital History: The James Monroe Papers

Our project is a website centered around the letters from James Monroe to the United States Secretary of State written during James Monroe's tenure as Minister to France from August 1794 through August 1796. We are transcribing and providing a summary of each letter written by James Monroe during that time period in France. Additionally, we want to provide an interpretation of Monroe's letters based on the context provided from the transcriptions and summaries and additional research of the international political atmosphere in the late 18th century through an exhibit, an interactive map, and a timeline of James Monroe's tenure in France. Our goal is to create a website for undergraduate history students where they can freely view, and read, these important primary documents in American diplomatic history while providing a general context of the times. To achieve this, we are using some of the newest digital interfaces to present this time in American history: the Omeka interface to create a public, interactive website, Simile, an interface which allows us to produce an interactive timeline, and a web-based tool which allows the user to "zoom" into and out of an image, allowing our users to read the digitized letter while reading our transcription. In this presentation, we will present our website as a way to illustrate the applicability of web-based tools in presenting history to a wider audience.

Detweiler, Zachary

Chemistry

Faculty Sponsor: Kelli M. Slunt

Analysis of Estrogen Content in Bovine Milk

Recently, there has been an increase in the occurrence of diseases associated with endocrine disrupting estrogens (beta-estradiol, 17-alpha-estradiol, estrone and estrinol). There are several sources of these estrogens in a normal diet, mainly milk and eggs. Research has shown that the estrogen content of milk is somewhere around a 300 picomolar concentration. The focus of my research has been to determine a difference in the concentration of estrogen in milk from cows that have been treated with recombinant bovine somatotropin and those that were raised without the hormone. The milk must be put through a detailed extraction process in order to isolate the estrogen from the rest of the milk matrix. After being isolated it can then be analyzed using high performance liquid chromatography. The concentration differences determined to date will be presented.

Donaher, Chris and Hatfield, Jesse

Computer Science

Faculty Sponsor: Stephen C. Davies

User Interface Design Considerations for Semantic Web Authoring Environments

The World Wide Web of today is primarily geared to human interaction, and would benefit greatly from an additional layer of data created specifically for automated analysis and computer navigation. If non-technical end users are to contribute to this Semantic Web as they have to the Web of Documents, they must be able to use simple tools to do so. This challenge is not easy to meet, as formal knowledge representation is a daunting task for the uninitiated.

This paper reports on a controlled experiment in which novices attempted to use a prototype Semantic Web interface to both find and encode bits of everyday knowledge. The application presents a user-friendly veneer to the Semantic Web, manifesting the essential graph-based nature of the data model while shielding the user from the complexity of syntax. This allows us to study user behavior in attacking the deep, cognitive problem: breaking down knowledge into the triple-based structure required by RDF Linked Data, the fundamental atomic unit of the Semantic Web. Our study sheds light on some of the key aspects of knowledge formulation that novices struggle with,

and suggests several specific design approaches for Semantic Web Authoring Environments to address these crucial issues.

Donnelly, Caitlin; Lefferts, Stephanie; Wilson, Kari; and Arndt, Jenn

History and American Studies

Faculty Sponsor: Jeffrey W. McClurken

The Life and Legacy of Mary Ball Washington

The purpose of our website is to educate the University of Mary Washington and Fredericksburg community on who Mary Ball Washington was and why she was significant. Through a survey of the UMW student body, we have found that most students know that Mary Ball Washington was the mother of our first president, but when asked why she was important not many people can provide more information. Our group aims to produce a website that follows the life of Mary Ball Washington chronologically. We intend to cover topical areas of her life, including her personality, relationships with family members, such as her son George, and her legacy. This website will cater to an audience that includes those affiliated with the University of Mary Washington, residents of Fredericksburg, and anyone else who may be interested in Mary Washington. With diligence and hard work we hope to produce an informative and interesting website that provides a more in-depth look into the life and legacy of Mary Ball Washington. As the University of Mary Washington is implementing a new strategic plan over the next five years that will celebrate the life and times of Mary Washington, we hope that our website will provide another reference to the life of Mary Washington and her impact.

Downey, Michael

Economics

Faculty Sponsor: Robert S. Rycroft

Micro-simulation of intergenerational wealth

This is an updated version of Frederic Pryor's micro-simulation model which attempts to describe the distribution of wealth in society through simulating populations which work and gain income, have children, die and pass wealth down from one generation to the next.

In my research I have recreated Pryor's program and have examined the impacts of allowing the income of the all the children of the each subsequent generation to be related to their parent's generation with some standard deviation on the equality of society. I have also examined the impacts of immigration on equality. For equality I have used the Gini coefficient just as Pryor had, for both income and capital.

Gallagher, Jimmy; Reichert, David; & Willess, Sean

Computer Science

Faculty Sponsor: Jennifer A. Polack-Wahl

Helping UMW Departments by Creating Data-Driven Website

This research project involved three students working on software that was originally developed as part of CPSC Software Engineering. The goal of the course is for students in computer science major to learn how to develop software in the real-world. While each of the described projects was completed further maintenance was needed to enhance the usability of the software. David Reichart continued a project for the Women's Soccer Coach Corey Hewson who requested software for recruiting students for the UMW Woman's Soccer Team. This software allows potential recruits to make profiles with information that Coach Hewson can use to evaluate them. Jimmy Gallagher continued the Business Career Website request by Dr. Carol Creque. The premise of the site was a place where juniors, seniors and alumni could post and respond to job offers. Finally, Sean Willess spent the semester upgrading and maintaining the IT's

UMW Spaces website. The website is a database-driven website requested by Mr. Jerry Slezak, the head of the UMW IT Department. The website intention was to allow IT to manage and organize UMW IT equipment and supplies.

Gallasch, Ryan

Sociology

Faculty Sponsor: Leslie E. Martin

Elections in Fredericksburg

This research paper seeks to examine the impact race has on voter-turnout in the City of Fredericksburg Virginia. Historically race has had a major impact on who votes and who does not and this has been illustrated in urban areas. The impact that demographic voter turnout has on public policy cannot be understated. Elected officials seek to satisfy their voters and not necessarily their non-voting constituents. This paper uses newspaper stories from across the Fredericksburg area to create a background about the critical issues the media sees in the electoral process. It also utilizes field research done on Election Day 2009. It also looks at election turnout results by precinct versus demographic records of the precincts from election 2000 to election 2009. From analyzing the results of this study one can better understand race relations both in the urban world and in the political realm. The research I conducted found that there are no significant signs that there is any racial discrimination in the electoral process in Fredericksburg. Based on field observations and quantitative data, minority groups appear to vote at similar levels and have similar opportunities to vote as white residents of Fredericksburg.

Gallasch, Ryan

Sociology

Faculty Mentor: Tracy B. Citeroni

'Benching' at UMW: An Observational Culture on Campus Walk

My project seeks to explore the culture of bench sitting at the University of Mary Washington. Bench sitting consists of taking time out of one's day, in a group or by oneself, to sit on a bench on campus walk and watch people as they go by. People who 'bench' in groups often talk with each other while doing so. This study distinguishes 'benching' from everyday conceptions of 'people watching' in other contexts. My central research goal was to understand how and why 'benching' is practiced at UMW. How and why do students do it; what does it mean to them; what social purpose does this activity serve; and what, if anything, does it communicate about the broader culture of UMW? I conducted individual interviews, engaged in participant observation, and moderated focus groups to gain information on the subject. My preliminary findings suggest that 'benching' is a strangely anti-social social activity. Students report being bored and seeing campus walk as an attractive place to hang out alone or with friends. However, rather than meeting or greeting strangers in that space, they maintain social distance by sitting back, observing, and often passing judgment on those others who walk by.

Gavigan, Brianna

Sociology

Faculty Sponsor: Debra J. Schleef

Just How Truthful Is Child Care Portrayal Within Sitcoms?

As evidence obtained from data within the United States Census Bureau shows, child care within the United States is an ever changing concept. Statistics regarding child care evolve as the times do, which leaves much to be interpreted based on knowledge of the pertinent times. The question of to which social norms child care tendencies change with is a difficult inquiry to answer. But, through research of the relevant times in relation to the data that is available, we begin to see correlations between child care and how involved in the work force mothers were at that specific time. Next, the concept of child care portrayal through media is a

complicated one. By observing these portrayals within sitcoms through the 1960s to present, one can make assessments on to how truthful these portrayals are in reference to the actual data provided by the United States Census Bureau.

Geissler, Genine

Modern Foreign Languages

Faculty Sponsor: Elizabeth F. Lewis

El Teatro Campesino and the Chicano Brown Power Movement

El teatro campesino or the farmworkers' theater began with migrant farmworkers performing one act plays called *actos* on flatbed trucks located in open fields, often without prewritten scripts or stage props. The actors were farmworkers themselves, so it is not surprising that the plays were inspired by the events in the lives of the audience. In the mid 60's, at the height of a political revolution of protest against the abuse of human and civil rights, these theatrical expressions of social, political and cultural perceptions of the farmworkers' theater became a significant technique for informing farmworkers, who could neither read nor write, nonetheless understand English, about their rights. The creative form of the farmworkers' theater became an important tool used in the 60's and early 70's by playwrights such as Luis Valdez to reach the farmworker and helped to advance the cause of many political organizations that were looking to promote and protect the civil rights of Mexican-Americans. Luis Valdez continues to inspire chicano/a audiences throughout the U.S. through his plays that continue to deal with cultural perceptions, political actions and social protest.

Groman, Rebecca; Sleeman, Allison; Tuhy, Elinor; Yantis, Caitlyn; and Zupko, Eric

Psychology

Faculty Sponsor: Holly H. Schiffrin

The Impact of Affect on Cognitive Processes

Previous research has indicated that mood impacts cognitive functioning. Pilot studies were conducted to determine the effect of mood on cognitive tasks including a global-local task, and the Choice Dilemma Questionnaire. Follow-up studies will examine whether positive affect can undo the effects of negative affect on cognitive processing. Frederickson (1998) proposed the broaden-and-build hypothesis to explain the evolutionary benefits of positive emotions. This theory states that positive emotions increase a person's thought-action repertoire, while at the same time building their physical, cognitive, psychological, and social capabilities.

Expanding upon the broaden-and-build hypothesis, Frederickson and Levenson (1998) have proposed the undoing hypothesis. This hypothesis states that positive emotions can undo the physiological changes caused by negative emotions. It is the goal of this study to show whether the undoing hypothesis can be applied to other areas covered by the broaden-and-build hypothesis, specifically cognitive functioning (Falkenstein, Schiffrin, Nelson, Ford, & Keyser, 2009). In a global-local processing task, there is evidence to suggest that global processing (i.e., the big picture) typically precedes processing the details (i.e., local elements) of stimuli (Navon, 1977). However, research has consistently found that people who are experimentally induced into a negative emotional state will focus on the local rather than the global elements of the stimulus (Basso, Scheff, Ris, & Dember, 1995; Fredrickson & Branigan, 2005).

Another task, the Choice Dilemmas Questionnaire (CDQ), was used to measure the probability of taking a risk in 12 hypothetical situations (Wallach, Kogan, & Bem, 1962). Based on the Affect Infusion Model (AIM), people in positive moods are more likely to take risks than people in negative moods because they are able to see the benefits of risk-taking (Chou, Lee, & Ho, 2007; Forgas, 1995). It is hypothesized that participants assigned to a positive affective state will demonstrate improved performance on the

cognitive task compared to either the negative or neutral conditions. The results will be discussed in terms of the broaden-and-build and undoing hypotheses.

Hall, Megan; Travers, Bridget; Pieper, Bill; Moore, Sarah; Dinndorf, Helen; and Corcoran, Chelsea

Historic Preservation

Faculty Sponsor: Andrea L. Smith

How Luddites Can Design a Website

It is increasingly necessary to use technology to reach a broad audience. In some cases, sources which were once spread out, difficult to access, or even unavailable, can now be centralized and organized to make them useable by laypeople.

The historic preservation planning laboratory has tackled such a project this semester. Although Fredericksburg is a city of recognized historic value, there was no database compiling its historic resources. Anyone interested in learning about a specific building in Fredericksburg would have to know where to look, who to ask, and where to go to get that information. The new site www.fredbuildings.org was designed to solve this problem. The site not only lists historic buildings in Fredericksburg but also maps them, describes them, and provides photos and any available documents. Furthermore, the site also provides a glossary and links in order to be more accessible.

This presentation will first show how a visitor could navigate and use the site. Next, the problems encountered in designing the site will be discussed. In particular: multiple contributors, contributors that are “non-tech-savvy”, collecting content materials, compiling data, and finding free internet tools. This session will demonstrate how even people who are stuck in the past can create a site that looks professional and functions as it should.

Hillyard, Jonathan

Biological Sciences

Faculty Sponsor: Deborah L. Zies

Characterization of the Per1 Gene Promoter Using Chromatin Immunoprecipitation

Hypertension severely affects the lives of individuals diagnosed and puts them at higher risk for more advanced cardiovascular disease. Blood pressure is directly affected by blood sodium concentration with higher concentrations leading to higher blood pressure. Additionally, blood pressure is regulated through the 24-hour circadian rhythm cycle. A normal individual's blood pressure is said to “dip” at night, meaning it will decrease from its daily value. There has been a proposed molecular mechanism for the relationship between dipping and sodium concentration that involves the hormone aldosterone. Aldosterone was already known to regulate blood sodium and recently it was found to regulate the circadian gene Period homolog 1 (Per1). In this study, we hypothesize that aldosterone affects Per1 expression by interacting with its receptor and directly binding to the Per1 promoter. The hypothesis is being tested using chromatin immunoprecipitation (ChIP). Current research has been focused on standardizing the ChIP procedure. Thus, preliminary ChIP techniques have been mastered and steps have been taken to confirm that the Per1 promoter can be amplified at each step. Given that the project continues in the correct direction without unpredictable obstacles, the ChIP procedure will be completed and the results will support or refute our hypothesis.

Hölljes, Sarah

Art

Faculty Sponsors: Joseph Di Bella and Lorene Nickel

Capturing the Gift: A Presentation for Honors in Studio Art

The premise of my work is capturing the gift and love of life, be it beautiful, harsh, sad, joyful or a combination and thus share myself with the viewer how I see the world. The

problems I often face and try to solve deal with a need for control and perfection contrasted with a desire to let go. There are often times in my work when I face a point of frustration and have to step away in order to let go of the ideal concept of the work's origin. Working in several different ways, I often find that my least planned moments of creations give birth to my strongest work. I like silence when I work because it allows me to pray and think, it allows me to converse with God, to be silent so that I can hear. This way of working is very important to the outcome because it is in these moments that the works begin to speak and take on their own direction. The loose, expressive quality of my paintings are especially created in this way while sculpture, textile and ceramic work show the interaction between analytical concept and letting go of idealized perfection.

Huxtable, Caitlin

Earth and Environmental Sciences

Faculty Sponsor: Dr. Melanie D. Szulczewski

Practices, Perceptions, and Exposure of Citizens Regarding Hazardous Household Wastes

An awareness and understanding of what is being thrown away by community members is becoming increasingly important. Many everyday products are considered hazardous and should be used, stored, and disposed of carefully. This research assesses the perception, knowledge, attitudes, and behavior of Fredericksburg, Virginia, area residents regarding their household chemical use, disposal practices, and environmental exposure, focusing on common household pesticides, lead-containing products, and hazardous household waste (HHW) behavior. Responses from surveys revealed that 94% of respondents use pesticides and other HHW, but only 59% of respondents consider themselves to be knowledgeable about HHW. Over 45% of respondents still dispose of HHW in their municipal trash, despite the fact that 82% claimed to use their local facilities for HHW disposal. Interesting differences appeared between households with and without children, with 33% of households with children and 50% without expressing strong concerns about HHW. Preliminary chemical analysis of household samples detected no pesticide residues in any of the homes despite residents' concerns. Knowledge may be an important factor regarding people's perceptions and behavior regarding HHW. These findings indicate that community education has provided and can continue to provide improved awareness and disposal practices.

Jones, Emma

Earth and Environmental Sciences

Faculty Sponsor: Neil E. Tibert

Paleoenvironmental Record of Climate and Anthropogenic Modifications to the Potomac Estuary: The Collapse of a Commercial Fishery

The Potomac River is a tidally influenced, salt wedge estuary that has experienced significant environmental degradation since the nineteenth century Industrial Revolution resulting from human overpopulation of the watershed, overfishing, and landuse modification. A detailed paleoenvironmental record for the region establishes impacts of 20th century anthropogenic influences within the Potomac estuarine system. The research area encompasses the middle estuary from Fairview to Colonial Beach, Virginia. Development and destruction of the oyster industry best exemplifies human alteration of the region. *Crassostrea virginica*, the Eastern Oyster, once flourished in the Potomac marine waters, but historical overharvesting and recent disease transmission has steadily weakened populations. The decrease in oyster reef communities and subsequent reduction in water quality share an undeniable relationship within the Chesapeake Bay ecosystem. Anthropogenic modifications have transformed the Potomac River from an oceanographically controlled body to a river-influenced system. With salinity change and downstream migration of the salt wedge, habitats

evolved ensuring the estuary's inability to sustain healthy oyster populations. Despite human efforts to restore water quality to pre-industrial levels through the rebuilding of oyster reefs, the infiltration of disease and transformation of the river into a nearly freshwater system ensures oyster populations will never return to previous levels.

Kidder, Jessica

Earth and Environmental Science

Faculty Sponsors: Charles E. Whipkey and Abbie M. Tomba

The Effects of Acid Mine Drainage on Macroinvertebrate Diversity and Abundance in Contrary Creek, Louisa County, Virginia

Contrary Creek receives acid mine drainage (AMD) from abandoned gossan, pyrite, and gold mines, and is considered one of the most polluted streams in Virginia. AMD is associated with high acidity, increased turbidity, precipitation of iron hydroxides, and elevated concentrations of dissolved metals in the stream water. Our objective was to determine the relationship between macroinvertebrate abundance and diversity with the physicochemical habitat variables resulting from AMD. Impaired water quality from AMD is hypothesized to cause a decline in macroinvertebrate abundance and diversity. Samples were collected at 15 sites within Contrary Creek and 8 sites from its tributaries. At each site we measured habitat parameters, including conductivity, temperature, pH, and water velocity and collected water chemistry, sediment, and macroinvertebrate samples. Macroinvertebrates were assessed by collecting 3 Surber samples in both riffle/run and pool habitats. Macroinvertebrates were preserved in ethanol and identified to family. The Shannon-Weiner Index and North Carolina Biotic Index were used to assess macroinvertebrate diversity and pollution tolerance.

Klein, Dayna

Sociology

Faculty Mentor: Tracy B. Citeroni

The Facilitation of Social Service Programs as Experienced by First- Time Users in Central Virginia

In light of the lagging economy, little research has been done on how social service agencies have responded to the increased demand for social services and how they have responded to the increased pressure to demonstrate what benefit is derived from the types of services rendered. With this research, my goal is to identify the types of immediate social services available, discover what is required to maneuver through the process of obtaining social services for those new to the process, and to give voice to those using these services to identify the accessibility and perceived benefit they have received. More specifically, my research details how social services provided by the Salvation Army in the central Virginia area can be made easier to identify and easier to take advantage of by those not familiar with the process. The dissemination of specific knowledge of what programs are available and how to use those programs may increase the likelihood of the services being useful and meaningful to the participants thus resulting in a positive outcome.

Klein, Dayna; Van Orden, Tammy; Asbell, Robin; and Herman, Teresa

Sociology

Faculty Sponsor: Debra J. Schleaf

Educational Attainment: A Predictor of Juvenile Delinquency and Adult Offender Recidivism

The idea that educational attainment is linked with crime is not a new one. The purpose of this study is to investigate the possible relationship between educational attainment and deviant behavior. The education levels of approximately three hundred District 21 probationers, located in central Virginia, is contrasted with self-reported acts of juvenile delinquency and occurrences of adult reoffending. A survey with a series of questions about their personal, socioeconomic, family and educational backgrounds, was administered to the probationers. We collected and analyzed data in an effort to

determine if, in this sample, levels of education are related to rates of offending. We tested the implications of these findings to gain insight about the impact local variations in acquired education and contact with the criminal justice system have on rates of offending for individuals in central Virginia.

Kollman, Kathleen

English, Linguistics, and Communication

Faculty Sponsor: Paul D. Fallon

A Qualitative Study of English Language Instruction in Spanish Schools in Response to Education Changes

Currently foreign language classrooms in Spain and the United States face a similar obstacle, since both countries are considered behind much of the world. The difference is that the Ministry of Education in Spain has passed recent educational reforms, some of which focus specifically on English language instruction, since English is becoming a prominent language worldwide. In the United States Spanish has been considered a foreign language, though with the continuous rise of Hispanic immigrants, Spanish is becoming an important second language to learn for American citizens, much like English in Spain. American educators may be able to learn something from the changes being made in Spanish schools. Before the 1990's reforms, much of the focus in English classrooms was placed on grammar-translation approach, an approach that is widely employed in the U.S. and generally found to be ineffective for students in both Spain and the U.S. In response to the educational reforms, Spanish teachers of English were instructed to instead emphasize the importance of oral and written expression. Kathleen observed English language classrooms in Granada, Spain, in order to identify specific methodologies that may be applicable to classrooms in the US.

Krieg, Sam

Modern Foreign Languages

Faculty Sponsor: Shara Voisard

Como un cometa minúsculo: Octavio Paz and Surrealism

During a 1972 *Diacritics* interview, Octavio Paz said that "I was a Surrealist at a certain moment in my life... I try not to be unfaithful to that moment." From the mid-1940's until the early 1950's, the Mexican writer lived in Paris and began an association with the French Surrealist movement that would last for the rest of his life and result in Paz becoming the movement's international face. However, despite this prominent connection, Paz did not hold to all of Surrealism's tenants. In particular, Paz disagreed with the dependency of Surrealism upon Freudian psychology.

In 1951, at the end of his time in Paris, a collection of prose poems by Paz called *Eagle or Sun?* was published, and this essay examines a prose poem from it called "The Blue Bouquet." In my analysis, the elements of the prose poem allow Paz to express his disagreement with the psychoanalytic explanation of, and prescriptions for, modern man's disillusionment. This is put in contrast with the writings in which Paz proposes his own philosophical solution to the ills of modern man through using poetic composition and an anthropological awareness of the past to create a future environment in which mankind can flourish.

Christiane Lauer

History and American Studies

Faculty Sponsor: Jess M. Rigelhaupt

James Farmer to a Friend: A Fear of Being Forgotten

Through oral history narratives one can begin to understand who James Farmer was while at the University of Mary Washington. Margaret Mock worked with Farmer as a colleague when she worked with him through the Mary Washington College Office of Public Information. She also knew him as a teacher and eventually as a friend. Mock discusses Farmer's popularity as a professor and his impact on diversity at UMW. She

discusses Farmer's time on campus and how he is remembered. Ms. Mock talks about the role that the media played in Farmer's time at Mary Washington and also about Dr. Farmer's relationship with the local media in Fredericksburg and Richmond. Through oral history narratives one can begin to understand who James Farmer was while at the University of Mary Washington. Margaret Mock worked with Farmer as a colleague when she worked with him through the Mary Washington College Office of Public Information. She also knew him as a teacher and eventually as a friend. Mock discusses Farmer's popularity as a professor and his impact on diversity at UMW. She discusses Farmer's time on campus and how he is remembered.

Lescault, Tara A

Theatre and Dance

Faculty Sponsor: Kevin J. McCluskey

Juliet's Party Dress from *Romeo & Juliet*

For her capstone course in the department of theatre and dance, Tara made Juliet's ballgown for the department's production of *Romeo and Juliet*. The objective of the project was to show Tara's skills as a costume maker—or stitcher, skills that are the culmination of her years at Mary Washington studying costume design and construction.

While the costume was completed over a period of four weeks in the Spring Semester utilizing construction techniques common in professional costume studios, Research for the building process was completed during the Fall semester.

Levine, Cary; Mackey, Mary Ann; Whiteaker, Megan; and Jonathan Wigginton

History and American Studies

Faculty Sponsor: Jeffrey W. McClurken

Mary Washington Images throughout the Years

The primary goal of the Mary Washington Images group from Dr. McClurken's Digital History class is to develop an easy and efficient way to collect information about 200 photos of University of Mary Washington/Mary Washington College throughout the years, soliciting the help of alumni for identification purposes. This will help the existing UMW Archive to update their records and to present a more complete representation of the school's history. The group will do this by organizing the photos they have chosen in an Omeka-based website and encouraging alumni to visit and contribute in whatever way they can. One of their secondary goals, however, is that this site will be a place where alumni can view the images of UMW/MWC in a manner that is more easily accessible than the current archive in place. The site will provide the link to the current archive so that interested viewers can access it, but the group hopes that their site will be the destination for alumni to visit. As the information from alumni comes in, the group will share it with the archives and archivist Carolyn Parsons, to help the library further their own records. Another secondary goal in the development of this site is to build it in such a way that it will encourage future groups to follow the lead and continue to update the site, communicating with alumni and identifying more unknown pictures. Finally, the images group hopes to accomplish all of this in a professional manner that works with the nostalgia and enthusiasm of the alumni rather than causing any frustration on their part due to an overwhelming amount of unnecessary correspondence from the group.

Longerbeam, Anne

English, Linguistics, and Communication

Faculty Sponsor: Judith Parker

The Effect of Syntax on Attitudes toward Domestic Violence Victims

This project seeks to raise awareness about the effects of syntax in everyday reading materials, such as newspapers, on people's attitudes toward domestic violence victims. Earlier research has indicated that passive syntax that does not explicitly include an agent affects readers' responses to sexual assault crimes (Henley 1995). Research has also shown that attitudes toward sexual assault victims can be measured through a specific scale constructed by Ward (1988). The present study examines how educating and promoting issues of concern to women helps to decrease negative attitudes toward domestic violence victims. Based on responses by psychology students and women's studies students, I will test three hypotheses: there will be a significant difference between the psychology pool students and the women's studies students; among the different levels of verb voice; and between the baseline scale, Scale A, and Scale B. The aim of this study is to provide a basis for further research into why subjects hold a higher level of negativity in their attitudes toward domestic violence victims while reading articles with specific syntactical patterns.

Love, Patrick

Psychology

Faculty Sponsor: David A. Rettinger

Risk, reward, impulsivity, and social presence: Measuring their interaction and their effects on academic cheating.

There are many different factors which influence a student's decision to engage in morally questionable behaviors like academic cheating. Several studies have linked high levels of impulsivity to an increase in risky behaviors including academic cheating (Zuckerman, Eysenck and Eysenck, 1978; Rettinger et. al., 2010 unpublished data). However, other factors like an increased risk of getting caught or insufficient benefits to the behavior play into this decision (Murdock and Anderman, 2006). In order to test how impulsivity, potential risk and reward of the behavior and the presence of other factors affects academic cheating participants will be asked to complete a survey.

The survey will ask participants to report how often they engaged in several different forms of academic cheating behaviors split into two groups, Public Cheating and Private Cheating. Participants will also be asked to rank the relative benefits and risks associated with these cheating behaviors and complete the Barratt Impulsiveness Scale, a measure of impulsivity. The current research expects to find positive correlations between past cheating behavior and the participants' level of impulsivity, the private nature of the cheating behavior, and associated potential of reward for each behavior.

Magruder, Matthew

Environmental Science

Faculty Sponsor: Ben O. Kisila

Application of ^{210}Pb isotopic fingerprinting to identify sources of sediment and erosion rates in local watersheds

Excessive amounts of sediments are known for their negative impacts on aquatic ecosystems including the conveyance of pollutants like trace metals and nutrients into aquatic ecosystems. The Chesapeake Bay is an impaired water body due to excess sediments and nutrient fluxes. The Rappahannock River Basin contributes the greatest amount of sediments in tons/mi² to the Bay, therefore a comprehensive approach to water and soil management that takes into account both anthropogenic pressures and geomorphic characteristic is needed to save this important water resource. To identify critical runoff and sediment contributing areas, ^{210}Pb was used as a tracer to fingerprint suspended sediments and soils in various land-use/land-cover areas in three sub-watersheds of the Rappahannock, the Claiborne Run, Little Falls Run, and Horsepen Run watersheds.

The fingerprinting result shows that in Claiborne Run and Horsepen Run suspended sediment loads were characteristic of disturbed environments, 10.26 dpm/g and 10.16 dpm/g

respectively. Closely matching values were found in stream banks within the Claiborne Run watershed and ATV trails within the Horsepen Run watershed. In addition, 30 cm soil cores were collected from each of the land use/land cover sites in the three watersheds in order to estimate erosion rates. It was determined that grasslands had low rates of erosion while farmlands experienced both erosion and deposition.

Markiewicz, Holly.

Modern Foreign Languages

Faculty Sponsor: Marisa Martinez-Mira

The Effects of Graphic Organizers in Spanish Reading Comprehension for High School Students of Spanish as a Second Language

This study will evaluate whether graphic organizers improve Spanish reading comprehension for high school students studying Spanish in upper level language courses. Research claims that effective analysis of the discourse of the text facilitates comprehension. The discourse of the text is a logical organizational pattern in the text which communicates the text's message with the reader. This four week research study will measure the effect on reading comprehension through a pre and post questionnaire, a pre and post assessment, and three reading passages paired with comprehension questions and a graphic organizer representing the text's discourse structure. Half of the participants will be placed in the control group and given all materials except the graphic organizer. The other participants will use the organizer. The results of the individual and overall comprehension assessments will be compared for both groups to determine the effectiveness of graphic organizers on reading comprehension in Spanish.

Matta, Kate

Biological Sciences

Faculty Sponsor: Alan B. Griffith

Diversity of Riparian Vegetation and Downstream Distribution of Yellow Water Lily in a Tidal Wetland System Prior to Dam Removal

My study was conducted at the Vandell Dams, a pair of small dams in a low-energy tidal wetland system, in New Kent, VA. The purpose of this study was to track conditions before dam removal in order to understand the changes to vegetation after removal.

I focused on the differences in diversity and in populations of exotic plants versus native plants located around the pond. I placed sixty 1-m² quadrats around the pond at the waterline, and then estimated the percent cover of the three plants with the highest cover, as well as the total number of species at each quadrat. I found that species richness was not affected by the presence or high percentage of exotic species, which was not the expected outcome.

Using GIS, I also mapped the area of yellow water lily on Holts Creek upstream and downstream of the dam's drainage area into the creek. I took several points along the edge between lily patches and open water; these points were matched to aerial photographs of the area. Since lilies are dependent on a certain water depth for growth, changes in colonization area might indicate physical changes, such as sedimentation or erosion, after the dam is removed.

Mattos, Justin

History and American Studies

Faculty Sponsor: Jess M. Rigelhaupt

Fighting Racism Through Pleasantries and Pedagogy: The Civil Rights Movement Comes to Mary Washington Part II

Dr. James Farmer Jr.'s thirteen-year teaching career at Mary Washington College was the final stage of his civil rights career. While at Mary Washington, he taught his students to be sensitive to racial issues and to perceive other people as individuals. Moreover, he gave speeches and participated in on-campus forums that promoted his message that the Civil Rights Movement had not ended. He continually suggested that the nation still had much to do in terms of fighting to end racism within its borders. The combination of the oral historical analysis of interviews with college faculty, administration, and staff over the past three years, document-based and multi-media archival sources, and newspaper articles on Farmer show that Farmer promoted the belief that the then current fight against racism in the United States was economic and institutional in nature. Thus, he believed that extensive planning and organization needed to take place within the civil rights community in order to combat these forms of racism. These interviews also demonstrate that Farmer promoted racial sensitivity while building and maintaining close relationships with individuals throughout the Mary Washington community.

Mattos, Justin

History and American Studies

Faculty Sponsor: Jess M. Rigelhaupt

Professor James Farmer at Mary Washington College: An Administrative Perspective

My interview with Philip L. Hall, Mary Washington College's Vice President for Academic Affairs and Dean of the Faculty from 1985-2004, demonstrates that Mary Washington College's (now the University of Mary Washington) administration was proud to have Dr. James Farmer Jr. as a faculty member. Hall's characterization of Farmer's course as the most popular course in Mary Washington's history and as a living primary source further illustrate the administration's pride in Farmer's teaching. Hall believes that Farmer's legacy is that he was an outstanding professor.

Mattos, Justin

Modern Foreign Languages

Faculty Sponsor: Ana Garcia Chichester

The Depiction of Racial Discrimination Against Afro-Cubans in Cuba and the United States in *The Maids of Havana*.

Published in 2004, Pedro Pérez Sarduy's novel *Las Criadas de la Habana* follows the lives of two African-descended Cuban (Afro-Cuban) women—Marta and Graciela—throughout the twentieth century. Marta is an Afro-Cuban maid whose life stretches from the 1930s to the end of the novel in the 1990s. Her friend Inesita's daughter Graciela, on the other hand, leaves Cuba during the 1980 Mariel exodus and performs work in a variety of unskilled and low-skilled professions, one of which being a maid, in the United States. Unfortunately, Graciela performs work in these low-level professions after having worked as a scientific researcher in Cuba and having completed an academically rigorous education in Cuba and East Germany. While providing an honest portrait of Afro-Cuban life, Pérez Sarduy depicts the discriminatory treatment experienced by Afro-Cubans in Cuba and the United States. This representation of racial discrimination reveals the differences and similarities between the conceptions of race in Cuba and the United States. A literary analysis of the novel supported by secondary sources on Afro-Cuban life and history as well as secondary sources on critical race theory evidence these two assertions. Moreover, Pérez Sarduy's other writings support a multi-decade struggle to fight a lack of public discussion of Afro-Cuban life and history.

McElhannon, Jeff; Adams, David; Hamerski, Kevin; & Herold, Tyler

Computer Science

Faculty Sponsor: Jennifer A. Polack-Wahl

Developing Apple iTouch Education Applications for Hartwood Elementary

The “Developing Apple iTouch Education Applications for Hartwood Elementary” research involved learning how to program the Apple iPhone/iPod touch. The goal of this research is to create applications that would help k-2 students in reinforcing their weaker skills, as identified by the SOL’s and Virginia Annual Yearly Progress Reports. The applications will be tested and used in two classrooms at Hartwood Elementary.

The research involved learning how to use Xcode and the Interface Builder on Mac OS X. These applications are the tools needed to create programs for iPod platforms. Some programming concepts that were learned were views, view controllers, persistent storage, as well as using the location, touch, and sound on the iPod. These concepts are implemented using the Objective-C programming language. The projects that are currently in development focus on identifying and combining coins and using combinations of numbers to create the same number.

This project unites technology and education for use by kindergarteners, 1st and 2nd graders. The aim of this project is *to have an impact on kids and the world’s future* by helping to improve and reinforce areas of weakness of students in classrooms at Hartwood Elementary. Support our research by voting for it on <http://www.refresheverything.com/hartwood>.

McMullen, Phoebe

Art

Faculty Sponsors: Joseph Di Bella, Lorene Nickel

Memories of Family: A Presentation for Honors in Studio Art

My advanced work in painting has been inspired by memories of family and times past, and reflects my passion to find relationships within past moments in time. Not only do recollections of my family evoke sentiments for connection, but even a simple object, individual, or place can bring insight to my work. Working primarily from a series of old family photographs, I find myself constantly asking questions as to the life each individual lived, and what role they play in mine. My paintings are often tied to objects that I directly associate with the individuals in which I am portraying. From paintings held within a windowpane to creating small paintings on fabrics with embroidery, my pieces serve as personal keepsakes of my memories that evoke the memories of the viewer’s own life and past.

My work in textiles pushes the traditional boundaries by taking relatively two-dimensional hand woven fabrics and transforming them into three-dimensional sculptural flowers like forms. Weaving traditional stripes and plaids, these patterns are portrayed in bright colors of pinks, reds, deep purples, and oranges. Displayed on the wall, my sculptural “blooms” exhibit my passion for textiles as well as my non- traditional approach.

McTernan, Melissa

Psychology

Faculty Sponsor: David A. Rettinger

The Role of Impulsivity in a Moral Decision Making Model

This experiment will be based on recent research on impulsivity, which indicates that when faced with an opportunity for immediate reward many people often act irrationally. Specifically, they may behave unethically in order to achieve that reward due to a lack of self control. These people may be perfectly moral people who would choose to act otherwise in a situation that does not require much self-control, or, in other words, does not offer any temptations. However, oftentimes, the immoral decision is more pleasurable or practically appealing than the alternative. One such example is academic cheating, where temptation to be successful may override the decision to act morally.

Based on such information, the researcher would like to show that impulsivity plays an important role in the moral decision making process by studying cheating behaviors, contrary to most previous models that suggest that moral decisions are solely based on the reasoning process.

Miles-McLean, Haley A.

Biological Sciences

Faculty Mentor: Stephen W. Fuller

Developing the Protocol for an Allelopathy Laboratory

Allelopathy involves a plant releasing toxins which inhibit the growth of other nearby plants. Not all plants have this adaptation, and some plants are more sensitive to the allelopathic chemicals. Through a literature search we discovered that tomatoes are sensitive to Juglone, the allelopathic chemical produced by Black Walnut. We proceeded to develop a protocol for use in the laboratory of BIOL 121, Biological Concepts, to test how Juglone contained in the leaves, hulls, and stems of the tree affect the germination and growth of tomato seeds. These Black Walnut materials were separately ground in a blender, and then systematically tested to determine how each affected the seeds. Ten grams of the ground material was mixed with 100ml of de-ionized water, and then 3 ml of the solution/suspension was poured onto a filter paper in a Petri dish containing 10 tomato seeds. This solution was then diluted to $\frac{1}{2}$ and $\frac{1}{4}$ strength and tested in the same fashion. Since earlier allelopathy experiments used in BIOL 121 experienced problems with fungal infection, the effect of fungicides on the tomato seeds was also investigated.

Milner, Lauren; Brann, Taylor; Lease, Katelyn; and McMillan, Megan

History and American Studies

Faculty Sponsor: Jeffrey W. McClurken

Fredericksburg: City of Hospitals

In May, 1864 there was a mass evacuation of sick and wounded Union soldiers through the small city of Fredericksburg, Virginia. Most of the wounded came from the Battle of the Wilderness and the Battle of Spotsylvania Court House. Both public and private buildings housed soldiers and the U.S. Sanitary Commission, Christian Commission, and other civilian relief workers traveled to the city to help the wounded and dying. Our group has created an online site to inform students, teachers and people with an interest in the Civil War and local Fredericksburg history about a moment in time that is not widely known. Through interpretation of primary and secondary sources we want to educate the public and provide them with online access to these sources. We are hoping that by making certain aspects of the site, such as a timeline and map, interactive we will encourage visitors to want to explore and get excited about history.

Mulrey, Clare

Biological Sciences

Faculty Sponsor: Dianne M. Baker

The effects of atrazine on gene expression of appetite-regulating neurohormones in zebrafish, *Danio rerio*.

Endocrine disrupting compounds (EDCs) are exogenous chemicals that interfere with normal hormonal signaling and regulation. EDCs are released into the environment through the use or production of pharmaceuticals, plastics, pesticides, detergents, and other common products. One endocrine disruptor that is causing increasing concern is atrazine, a commonly used herbicide. Previous studies in a variety of animals have shown that atrazine can impair immune function, reproductive development, metabolism, and appetite. To investigate the mechanism by which atrazine inhibits appetite, I am studying the effect of atrazine exposure on gene expression of the appetite-stimulating neurohormones neuropeptide Y (NPY) and

ghrelin in zebrafish. I exposed juvenile zebrafish to one of two concentrations of atrazine (10 µg/L or 100 µg/L) or to control water for 15 days starting at 20 days post-fertilization. I have collected whole head RNA on day 15 of atrazine exposure, and 30 and 60 days after end of atrazine exposure. Levels of NPY and ghrelin mRNA are being measured by quantitative (real-time) PCR. Comparisons will be made across groups to assess acute and long-term developmental effects on the appetite regulatory pathways.

Murphy, MacKenzie

History and American Studies

Faculty Sponsor: Jess M. Rigelhaupt

When More Could Have Been Done: How Theory Plays into an Oral History Interview

This paper will focus on an interview with Cedric Rucker, the University of Mary Washington's current Dean of Student Life. Rucker was familiar with James Farmer, who he calls "a titan of the civil rights movement." Farmer taught for years at Mary Washington College (MWC). Rucker states that he was not treated according to his numerous accomplishments and experience. This interview and paper will provide insight into a complex view of Farmer's time at MWC.

Nathan, Stacey

Chemistry

Faculty Sponsor: K. Nicole Crowder

Surface Modification of Ti-6Al-4V: A Biomimetic Approach for Orthopedic Implant Applications

The purpose of this research project is to develop effective coatings for the titanium alloy, Ti-6Al-4V, which will allow orthopedic implants of this material to better integrate into the body since many primary joint replacements require revision surgery with 10 years. By coating the titanium alloy surface with two cell adhesion peptides, the amount of bone cells adhering directly to the implant may increase due to more specific cell signaling, thereby lengthening its lifetime in the body.

In order to attach peptides to the surface, Ti-6Al-4V samples were coated with 11-hydroxyundecyl phosphonic acid (HUPA) in order to create a monolayer of reactive hydroxyl groups. Then, bifunctional linker molecules were reacted with the samples in order to form a bridge between the surface and the peptides.

Confirmation of surface derivatization was done using fluorescent labels; this involved reacting samples with a linker molecule attached with a fluorophor instead of a peptide. Then, confocal microscopy was used in order to visualize the fluorophors. This produced images showing that the labeling reactions were successful, which implies that surface modifications with the peptides were as well.

Ney, Sarah

Biology

Faculty Sponsor: Abbie M. Tomba

Analysis of Alarm Chemicals in the Freshwater Crayfish, *Orconectes rusticus*

Utilization of chemical cues is an important survival tool for numerous aquatic organisms, especially crayfish. They have been shown to respond to odors from predator species, injured conspecifics, and food sources by changing posture or rate of movement. Many factors influence the ability of crayfish to detect these cues, such as the distribution and type of odor sources present as well as the local environment. In general, crayfish respond to odor from an injured conspecific (alarm cue) by displaying defensive postures, decreasing locomotion and feeding activity, and increasing shelter use. Studies using *Orconectes virilis* suggest that the hemolymph, or a substance found therein, produces this behavioral response. However, little is currently known about the relationship of crayfish behavior and hemolymph chemistry. The present study seeks to confirm that low molecular weight fractions (5 kDa)

produce the most pronounced alarm response, using a congeneric species *Orconectes rusticus*. In addition, we attempt to identify the chemical(s) responsible for eliciting these behaviors. Hemolymph samples were fractionated by mass using centrifugal filtration units. Fractions will be studied for behavioral response using food odor as a positive control. Preliminary results indicate *O. rusticus* displays an alarm response to both filtered and unfiltered hemolymph samples.

Pope, Ian

Earth and Environmental Sciences

Faculty Sponsor: Ben O. Kisila

Soil Erosion and Sediment Flux: A Watershed Study of the Ni Reservoir, Spotsylvania County, Virginia

Sediment control is one of the central aspects of catchment management planning as anthropogenic forces have altered the physical landscape. Soil erosion is of particular concern with regard to manmade sediment sinks such as the Ni Reservoir in Spotsylvania County, Virginia, and is likely affecting its sustainability. This project aims to study the sustainability of the Ni Reservoir and identify the sources of soil erosion within the Ni Reservoir watershed through a three-pronged methodological approach. A spatial analysis component by use of GIS was implemented using the RUSLE equation to obtain quantitative soil loss data. Isotopic analysis of sediment cores from the Ni Reservoir using the application of ^{210}Pb has provided data such as sediment accumulation rates and the actual amount of sediment that is being deposited in the reservoir. Lastly, an erosion pin apparatus was installed to determine the significance of stream bank erosion on the sediment deposition in the reservoir. Results from the spatial analysis indicate that an increase of human development from 2001 (14%) to 2009 (21%) may be contributing to an increase in soil loss – 3.14 ton/acre/yr and 4.59 ton/acre/year respectively. Soil erosion is a major problem with many negative environmental implications, including those on reservoirs.

Proffit, Jonathan and O'Neil, Lauren; Hall, Amanda and Menge, & Jennifer; Fehrman, John; Scott, Diana; and Johnson, Michael

Business

Faculty Sponsor: Carole Ann Creque

Case Study: Chick-Fil-A

Chick-fil-A, is a privately-owned quick-service restaurant chain in North America that specializes in the chicken sandwich. Over a period of 40 years they experienced double digit growth and reached the \$1billion sales threshold at the turn of the century and in 2007 surpassed that with sales of \$2billion. Truett Cathy founder of Chick-fil-A is a strong supporter of the “servant spirit” a core value of this organization. Chick-fil-A’s corporate purpose states that they aim to “glorify God by being a faithful steward of all that is entrusted to us and to have a positive influence on all who come in contact with Chick-fil-A”. Chick-fil-A operates Monday through Saturday allowing their staff, operators’ employees and customers a “day of rest” for family and prayer. Due to their loyal base of customers, employees and franchised operators it is suggested that Chick-fil-A has mastered “loyalty effect economics”. They focus on giving back by developing strong interpersonal relationships within the communities in which they are located by supporting kids and youth programs. Research indicates that the company is meeting and exceeding customer expectations in terms of service, quality of food and variety of offerings. This case study seeks to understand “loyalty effect economics” and how it applies to this business model. It explores the phenomenon of a six day work week as it relates to a positive growth pattern, sales strategies and profitability. It also explores the effect of a six day work week on employee, operator and customer satisfaction and loyalty.

Quarforth, Kimberly

Art

Faculty Sponsors: Carole Garmon, Lorene Nickel

Themes of Veneration: A Presentation for Honors in Studio Art

My work primarily revolves around themes of the veneration of death and ornamentation. I seek to convey at times a sense of reflection about those no longer with us and at other times an overly ornamented piece, which overwhelms the viewer. My pieces primarily revolve around either the use of matte acrylic medium or the use of fabric and the ways in which I choose to manipulate them. In all my pieces I am constantly searching for ways to transform the materials. With matte acrylic medium, I manipulate and distort pictures to transform concrete images into ones with a more ethereal and indistinct quality in order to subtly allude to those departed. With fabric, I aim to embrace the natural folds and gathers the material acquires while simultaneously manipulating these natural characteristics to suit the needs of the piece. In all of my work I strive to create pieces that are active parts of the spaces they embody, pieces that overwhelm the viewer and bring forth a number of ideas and emotions.

Reed Jr., Charles; Yannopoulos, Amanda; Linder, Alexis; and Hoffmann, Scott

Business Administration

Faculty Sponsor: Kenneth D. Machande

Legislative Effects on Economic Opportunities for Women: Title IX's Impact on the Corporate Board Room in the United States

Perhaps, the most meaningful legislative action ever undertaken in the United States that directly targeted women and their economic opportunities became American law over 35 years ago. Title IX, Education Amendments of 1972, changed the United States Code to ensure that "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. . . ." The Amendment resulted in many educational and athletic opportunities for women, which is well documented. For example, in 1994, women received 38 percent of medical degrees, compared with 9 percent in 1972.

A bigger question is whether the opportunities availed for women in the academic environment by Title IX translated to similar economic successes at the corporate level. Nearly 40 years has passed since Title IX was enacted, which makes today an excellent time to evaluate its immediate long-term effects. A traditional student entering college in 1972 when Title IX was enacted would be 55 years old today, an age at which most Board members have already been initially elected to the Board of Directors. Our study will endeavor to determine if Title IX affected the corporate boardroom by analyzing the gender make-up of Boards of Directors in a group of US companies, now and then.

Rickard, Laura Elizabeth

Physics

Faculty Sponsor: George King, III

Coupling Losses in Optical Fiber Transmissions

Honors research during the fall 2009 semester involved studying the transmission of AC and pulsed DC optical signals along optical fibers. The experimental activities required a thorough understanding of the concepts of critical angle, total internal reflection, index of refraction, and Snell's Law. A red LED was used as a light source for the optical signal and pre-packaged electronic modules to power/pulse the source. The transmitted light was detected by a photo-transistor and converted to an analogue signal by an electronic module. The optical fiber cable was a stepped-index

fiber with different refractive indices for the core and the cladding. By combining this cable with various modules, the effects of angle of light entry, cable length, analogue to digital transmission and filtering were studied. Some of the experimental results suggested that degradation in the transmitted light signals could be associated with a number of factors, such as a mismatch of the numerical apertures (NA), differences in core areas for linking fibers, Fresnel reflection, axial misalignment, and angular misalignment. In some cases, severe attenuation effects could result in as little as a 50cm piece of cable. The current focus for this project is to gain a better understanding of the signal degradation due to angular misalignment. Developing the skill needed for polishing the ends of the fiber optic cable will dictate the level of success of this phase.

Rowell, Kirsten

Education

Faculty Sponsor: George R. Meadows

The Effect of Concept Mapping Software on Third Grade Writing

This action research study demonstrates the effectiveness of concept mapping software in third grade language arts. After creating a concept map on the Kidspiration software program, students will write organized paragraphs about various social studies topics. Student writing will be analyzed to determine if this pre-writing strategy aids students in writing quality papers. Improvement on the length of their writing will also be evaluated.

Sack, Emily

Art History

Faculty Supervisor: Joseph G. Dreiss

Frank Gehry's Guggenheim Bilbao

"Frank Gehry's Guggenheim Bilbao" is both a study of innovative architecture and the power of architecture over its environment. Gehry's structure has been hailed one of the most defining buildings of its generation, and the advanced use of technology allows for designs that were never before possible. As a museum of contemporary art, the Guggenheim Bilbao offers visitors the most prominent work in the collection before they even enter the building. The undulating shapes of the exterior reflect the image of a ship sailing along the Nervion River. Gehry incorporates the river and the Puente de la Salve (bridge) into the design of the building, creating a landmark that fits into the environment simultaneously as a drastic contrast and an appropriate addition to the existing urban context. The aspect I would most like to focus on is the drastic change in the economic and urban identity of Bilbao as a result of the construction of the museum. In the decade immediately following the opening of the museum, Bilbao became a tourist destination and a new cultural landmark for travelers in Spain and internationally. The former industrial Basque city now has a thriving tourism industry and many works of contemporary architecture that compliment the old town in a modern and cohesive manner.

Sanders, Houston

Physics

Faculty Sponsor: George King, III

DC Magnetic Fields

Magnetic fields are important in many aspect of modern life. Bar magnets, commonplace in educational labs, have DC magnetic fields. The Earth's magnetic field, which protects life from the ultra-violet radiation from the sun, is static in time over the short term. NMR's and MRI's rely of DC magnetic fields, as does the LHC at CERN. DC Magnetic fields are produced by electrons moving steadily through a conductive medium, where the field strength is proportional to the magnitude of the current and its direction is perpendicular to

the direction of current flow. In the laboratory, a DC field can be created by passing current through a wire that is wrapped around a coil or other surface. Using Biot-Savart's Law a theoretical prediction can be made to estimate the magnitude of the magnetic field. In this project, careful measurements of the field strength were determined with Hall Effect sensors with two and three axes field component values. Detailed magnetic field mapping for a solenoid and flat coil, as well as, a room survey for one of the physics labs was conducted.

Sciequan, Diamond and Shewark, Elizabeth

Psychology

Faculty Sponsor: Christine A. McBride

Depression and Motherhood: Are Women with Postpartum Depression Good Mothers?

Our study investigated the stigma surrounding women with postpartum depression and the perception of these women as mothers. Participants read vignettes and responded to questions about their attitudes towards women with postpartum depression, general depression and diabetes including the perceived level of responsibility for the illness and emotional reactions toward the victims. The aim of the study was to better understand the origin and patterns of stigma toward postpartum depression to determine the best path for mitigation of any stigma.

Edwards and Timmons (2005) suggest that stigma is felt both internally and externally. These authors found that mothers with postpartum depression were afraid they would be perceived as unable to take care of their children and therefore would not seek treatment. However, no research has yet to show that women with postpartum depression are actually perceived as being "bad" mothers. Because research shows that those with depression are viewed as unpredictable and dangerous (Wang & Lai, 2008), we expected that women with postpartum depression would be viewed unfit mothers compared to women with other diseases.

Smith, Caitrin

Sociology

Faculty Sponsor: Tracy B. Citeroni

Bringing Your Class to Class: How do UMW students understand and experience their own and others' social class status on campus?

I conducted individual interviews and focus groups to generate data regarding students' perceptions of the salience of social class on the Fredericksburg campus of the University of Mary Washington. In the research, I treat the college campus as a relatively self-contained institution or social system. While a student's class is obviously impacted by outside forces, such as their parent's socioeconomic standing (in the case of so-called traditional students), the definition of class on campus can be different. College students of somewhat differing social classes are thrust together once they arrive at college, and one might think that their common identity as students would supersede any differences based on social class background. However, it is apparent that students are very much aware of the differences between people's economic statuses though they do not necessarily define it as a class system. My research investigates how UMW students define social class and delineates the criteria they use to distinguish one class from another. My goal in doing this research is to raise awareness of the role of social class at UMW, to facilitate mutual understanding between people of varying class statuses, and to highlight the ways in which social class shapes students' college experiences.

Spengler, Nina

Biology

Faculty Sponsor: Lynn O. Lewis

Identification of *Staphylococcus aureus* on computer keyboards at UMW

In today's epidemic-minded times, concern about exposure to pathogens in public spaces is widespread. Are users of public computers at risk of contacting a harmful bacterium? The purpose of this experiment is to determine if *Staphylococcus aureus* can be isolated from public computer keyboards on the University of Mary Washington campus. Computer keyboards and accompanying mice will be swabbed and plated onto T-soy agar. The colonies that grow were identified by shape and catalase reaction. Next a Staphylococcus Latex Test was used to identify any possible *S. aureus*, and colonies were identified with an API Staph test. The final test will be to determine if any colony exhibits methicillin resistance by streaking colonies with *S. aureus* characteristics on CHROMagar plates.

Thompson, Allyson
Geography, GISc Certificate
Faculty Sponsor: Brian R. Rizzo
Change Detection in the Marange Diamond Fields of Zimbabwe

The Marange diamond fields are an area of widespread small-scale diamond production located in Chiadzwa, Mutare West, Zimbabwe. The production of diamonds from Marange is controversial due to ongoing legal issues and government crackdowns. This project assess the landscape changes taking place in the Marange diamond fields using change detection methodology and techniques in addition to visual interpretation. Additionally I plan to develop a way to best display the time series image interpretation results and associate the geographic and quantitative information to the chronology of reported events.

Trimble, Sarah
Geography
Faculty Sponsor: Brian R. Rizzo
Retooling Historic Data Using GIS: An analysis of shoreline change on the Virginia Barrier Islands

This paper details an approach to shoreline change analysis using Geographic Information Systems (GIS). Analysis is performed by use of Digital Shoreline Analysis System (DSAS), an Environmental System Research Institute (ESRI) ArcGIS application offered for free download by the US Geological Survey. DSAS is used here to determine shoreline changes of the Virginia Barrier Islands along the Delmarva Peninsula. Imagery and shoreline data are collected and digitized. Shoreline features are manipulated into proper formats for calculating statistical rates-of-change for shorelines with the DSAS program. The addition of new data and free access to a shoreline analysis application provides tools for continued research in the study of shoreline changes.

Walker, Elisa
Modern Foreign Languages
Faculty Sponsor: Elizabeth F. Lewis
Yerba mate: A Window into Argentine Culture and History

This socio-historical study focuses on the history and cultural significance of *yerba mate*, a type of herbal tea that is central to the Argentine culture. Mate is considered a crucial symbol of Argentine identity, solidarity, and nationality; while at first this cultural importance might seem baffling, it is actually a product of its history. Throughout Argentine history, mate was important in every period and to every major historical figure: the indigenous people, the Spanish colonizers, and the gauchos (the mythical Argentine cowboys). In particular, the gauchos came to be seen as the epitome of Argentine values and traditions; since mate was a central element in their lives, mate also came to embody Argentine nationality, solidarity, and values. It is also an important social tradition that is typically shared with friends and family. This study analyzes the ways in which yerba mate is much more than a drink, but rather symbolizes solidarity, traditions, and the very essence of Argentine nationality.

Walker, Lindsay
Earth and Environmental Sciences
Faculty Sponsor: Neil E. Tibert
Climate Forcing and Anthropogenic Influence on Sedimentation for the Rappahannock Estuary
in the Chesapeake Bay Watershed

Sediment cores collected from Blandfield Point in the Rappahannock River record significant paleoenvironmental shifts for the tidal reaches of the Chesapeake Bay. A 141 cm core was analyzed for physical properties and micropaleontology to develop a record of paleosalinity for the past ~200 years. The sediment at Blandfield Point includes two distinct units. The basal unit is characterized by low magnetic susceptibility values and relatively abundant brackish ostracodes, including *Cyprideis salebrosa* and *Cytheromorpha curta*. Pore morphometric analyses of *C. salebrosa* demonstrate notable changes in shape from circular to highly irregular. The upper sedimentary unit is characterized by variable magnetic susceptibility values and the freshwater ostracode, *Darwinula stevensoni*. Calculated sedimentation rates based on ¹³⁷Cs dating are relatively high at Blandfield Point (5.4 mm/yr) and Hick's Landing (7.1 mm/yr). The basal unit containing fluctuations in *C. salebrosa* and *C. curta* abundances suggests variable paleosalinity. *Cyprideis* pore shape data corroborate this hypothesis, which indicates that regional and/or global climate may have influenced the maximum landward extent of marine water in the Rappahannock Estuary prior to the Industrial Revolution. Consequently, the transition to *D. stevensoni* at 57 cm indicates increased fluvial influence in response to aggressive land use after the onset of mechanized agriculture.

Williams, Jonathan S.
Chemistry
Faculty Sponsor: Charles M. Sharpless
Exploring Direct Photolysis Mechanisms of Polycyclic Aromatic Hydrocarbons (PAHs) in Non-polar Solvents

Polycyclic aromatic hydrocarbons (PAHs) are toxic components of oil spills whose fate is often controlled through photochemical reactions. However, PAH photodegradation mechanisms in hydrophobic media are not clear, which hampers efforts to predict PAH removal rates from oil in the event of a spill. Previous research suggests that direct photolysis, where the PAH degrades directly upon absorbing sunlight, does not explain rates of PAH loss in oil, which suggests that other reactions contribute to PAH photodegradation. One hypothesis is that singlet oxygen (¹O₂) generated by excited state PAHs is an important intermediate that reacts with and destroys PAHs. In order to test this hypothesis, we are studying the PAH photolysis mechanism in hydrophobic solvents. We employ a ¹O₂ scavenger, α-terpinene, to determine whether the hypothetical self-sensitized reaction with ¹O₂ is observed with four PAHs: benzo[e]pyrene, benzo[a]pyrene, benz[a]anthracene, and chrysene. Loss of α-terpinene in irradiated PAH solutions revealed the presence of ¹O₂ sensitized by PAHs. ¹O₂ quantum yields were also measured for each PAH in hexane using a Stern-Volmer analysis. We are also studying the dependence of PAH reaction rates on their concentration, which provides some insight into the reaction mechanism.

Woll, Hannah
Art and Art History
Faculty Sponsor: Lorene Nickel
Stereotypical Labels: A Presentation for Honors in Studio Art

In both my photography and my ceramics I aim to remove the stereotypical labels that words can have on common subjects, My ceramics in particular use the idea of a bowl or plate form as a foundation on which to build work. I alter these pieces so that a name of an object does not necessarily conjure a single idea or function of that object.

My photographs crop subjects so that the viewer notices the small details of parts that are often overlooked in the recognizable object.

Visual contrast is another focus of my work. I do this by contrasting natural shapes against geometric ones, and bold colors against natural body colors. I enjoy parallels between created human manipulation and natural textures and shapes of media. I can manipulate clay and frame a photograph but there is always something out of my control and it is on these details that I build to make my work unique.

Yantis, Caitlyn

Psychology

Faculty Sponsor: Holly H. Schiffrin

The Influence of Film-Induced Affect on the Remote Associations Task

Two studies were conducted to select effective emotion-inducing stimuli and test the effects of positive, negative, and neutral emotions on creative problem solving as measured by the Remote Associations Task (RAT). In Study 1, 43 participants viewed 15 emotion-eliciting films and rated each film using an emotion report form. The ratings were then compared to determine which of the film clips was the most successful in eliciting a discrete positive (amusement), negative (sadness) or neutral emotion. The results from this study were used to select the three films to be used in the second study. In Study 2, 32 participants completed a 22-item RAT and were then exposed to either a positive, negative, or neutral film clip. A second 22-item RAT was then completed. Compared to participants who viewed a negative film stimulus, participants who saw a positive film performed significantly better on the RAT. However, neither the positive emotion nor negative emotion groups differed significantly from the neutral group. The implications of these findings are discussed as well as directions for future research on emotions, specifically the undoing hypothesis.

Yoon, Sunnan and Pilati, Laura

Earth and Environmental Sciences

Faculty Sponsor: Ben O. Kisila

Comparative Analysis of the Environmental Evolution of Two Virginian Lakes: Lake Pelham and Lake Moomaw

High sediment influxes into reservoirs have well known detrimental impacts including the cumulative loss of storage capacity through siltation and declines of quality of life for inhabitant plants and animals. This study seeks to quantify the effects of anthropogenic and natural geomorphic processes in two Virginia reservoirs. Lake Pelham is located in Culpeper County, an area of relatively flat terrain and high human impact. Lake Moomaw is a nearly pristine reservoir located in the Blue Ridge Mountains and surrounded by forty-three miles of undeveloped forested shoreline. The Revised Universal Soil Loss Equation (RUSLE) and ^{210}Pb isotope were used to comparatively analyze sediment accumulation rates in the reservoirs and watershed soil losses while taking into account anthropogenic and natural geomorphic watershed characteristics.

The RUSLE models indicated that the Lake Moomaw watershed experiences a soil loss of 13.6 Mg/ha/y and the Lake Pelham watershed has a loss of 2.1 Mg/ha/y. The RUSLE/SDR sediment yield estimate for assumed pristine (100% forested LULC) conditions within Pelham Reservoir watershed was 0.42 Mg/ha/y compared to five-fold increase estimate of 2.15 Mg/ha/y for current land use conditions, while the assumed pristine conditions within the Lake Moomaw watershed sediment flux rate remained the same for current land use conditions. The ^{210}Pb isotope analysis results from three sediment cores show that the average accumulation rates in Lake Pelham range between 0.22 g/cm²/yr and 0.34 g/cm²/yr. All three locations show that modern accumulation rates have increased from historic rates at least 2-fold in Lake Pelham. Comparatively, average accumulation rates in Lake Moomaw were slightly lower, ranging from 0.19 g/cm²/yr to 0.26 g/cm²/yr. Sediment accumulation rates in

Lake Moomaw have also shown less historical change. These results show that anthropogenic influences have a greater impact on sediment accumulation rates than natural geomorphic influences. Sediment trace metals analysis will be used to verify the role of anthropogenic and natural influences.

Zeitz, Jessica

Computer Science

Faculty Sponsor: Stephen C. Davies

Addressing the Cognitive Difficulties of Expressing N-ary Relations in Semantic Web Data

The Semantic Web is an addition to the World Wide Web that organizes data in a way that accounts for the meaning of the data. This organization allows for, among other things, more comprehensive searching. Searches find data according to the intended meaning of the search rather than merely superficial syntactic matches.

I will present results from an empirical study in which everyday users attempted to generate formal knowledge representations for use in the Semantic Web. In particular, I focus on one especially difficult aspect of knowledge creation: statements that embody n-ary relations and therefore require reification of the verb in order to be expressible in the Semantic Web. In a cognitive experiment performed on over 80 novices, subjects were asked to author statements containing n-ary relations corresponding to textual passages they were given. My study compares the results between visual and text-based representations, illustrates the extent of the problem, and offers an alternative syntax for such relations that relieves several difficulties users face in properly formulating these statements. My results soundly demonstrate that by allowing the use of this alternate syntax in place of traditional approaches, noninitiates can achieve much greater accuracy and coverage in the knowledge they generate. Further, knowledge modeled with the syntax can be trivially converted to standard Semantic Web format "behind" the user interface, so that the knowledge a user generates constitutes a valid contribution to the Semantic Web.

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