

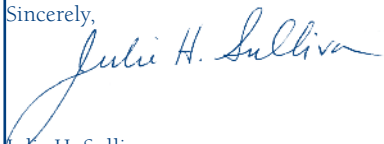
Creative COLLABORATIONS

WELCOME TO THE 5TH ANNUAL CREATIVE COLLABORATIONS CONFERENCE!

Welcome to the 5th Annual Creative Collaborations conference! Today we will celebrate student-faculty collaborative works from numerous disciplines. The featured research, internship, and artwork posters represent an impressive collection of undergraduate creative scholarship. When browsing the presentations, you will experience firsthand the commitment of students and faculty to the core mission and values of the university; which include the pursuit of academic excellence, the intellectual development of students and the commitment to community collaborations.

The conference continues to flourish and has moved to an expanded venue this year to accommodate over 150 presentations. I extend hearty congratulations to our student presenters and faculty advisors. The Creative Collaborations celebration has become an important USD tradition which enhances our intellectual life and distinguishes us among our peers.

Sincerely,



Julie H. Sullivan

Executive Vice President and Provost

Engaging undergraduate students in research, scholarship and creative activity is an important and successful practice for enhancing a liberal arts and sciences education. The works presented today exhibit the accomplishments of students in a broad range of disciplines and the exceptional work that can be accomplished by students in all stages of their academic career at USD, from the summer before they matriculate to USD through their senior year.

This inclusive celebration exemplifies the commitment that the faculty and students have to education, in and out of the classroom. The enthusiasm of the students is apparent in the wording of their abstracts and how clearly they have expressed the impact that their presented work has on their future directions. Congratulations to the students for their extraordinary commitment to their education and to the faculty for their support of student learning.

Sincerely,



Mary K. Boyd

Dean, College of Arts and Sciences



CULINARY WORK DOUBLE EXPOSED

JOSIE AMON

FACULTY ADVISOR: DUNCAN MCCOSKER

DEPARTMENT OF ART

In studying the work of established photographers, I became really interested in double exposure photos. For this project, I created double exposed prints with black and white film. I photographed the cooks of various restaurants and overlapped their photos of their work. Cooking is an easily forgotten art and I intend on bringing the works more widely into another art world.

THE PAINTED SURFACE: APPROACH-AVOIDANCE AND THE CONVERSATION

SARAH DE LOS SANTOS

FACULTY ADVISOR: JOHN HALAKA

DEPARTMENT OF ART

The psychological construct of approach-avoidance inspired me to explore the way the viewer interacts with a painting. Layers of imagery and subject matter within each of my paintings uncovered the realization that the layers within myself are just as complex. Themes of approach versus avoidance, comfort versus disorientation, and understanding versus confusion are explored through image, subject matter, technique, and presentation in order to develop a sense of interaction and dialogue between the viewer and the work. This dialogue should mimic the way people interact with one another, the first attraction, feelings of discomfort in learning some dark secret, and an eventual deeper understanding that subsequently leads to a more intimate interaction. By creating images that are not initially simply understood, these paintings become conversations that allow the viewer to gain a more insightful perspective on the subject matter presented.

PERSONAL GOOD LUCK SUPPLY

ROSS EHREN

FACULTY ADVISOR: ALLISON WIESE

DEPARTMENT OF ART

My art piece was created by good luck. I found a patch of clovers near my house that just happened to have numerous four leafed plants among the much more common three leafed variety. The four-leaf clover is an iconic symbol of luck, and the meaning of my piece plays with this symbolism. The real meaning of my art piece, however, is created when I remove these rare plants from their original area and horde them for myself, trying desperately to keep them alive for my own enjoyment, artistic exploration and of course luck.

12:01

ALEXANDRIA GARCIA

FACULTY ADVISOR: ALLISON WIESE

DEPARTMENT OF ART

Usually with dance, the focus is on the body movement. However, in my artwork the body remains absent. The focus instead is what was made as a result of dancing, which would be otherwise ignored. In this process-based sculpture, tap dancing altered the surface of wood by creating scuffs and dents. The evidence of the act is not only documented by patterns but also by an audio recording. The audio recording recreates the action, illustrating a story about the creation of the marks by tap shoes.

EXPERIMENT WITH LIGHTING AN AIR PUMP

WILLIAM HARTLEY

FACULTY ADVISOR: PAVLO BOSYY

DEPARTMENT OF THEATRE ARTS

As my first foray into the field of lighting design I found this project daunting. Working with my design mentor, I learned the technical elements of drafting a lighting plot, and developed my creative skills in creating unique and expressive looks for the play, "Experiment With An Air Pump." Inspired by the painting upon which the play is based, I worked to replicate the look of a still life in a three dimensional space. Using warm ambers, and shadow to sculpt the actors as well as cool more modern light to establish a clear distinction between the two time periods of the play. The most interesting endeavor was creating the "black hole" transition look, which tied the two worlds together, making the house appear suspended in time.

UPROOTED

JENNIFER MATSUMOTO

FACULTY ADVISOR: SABA OSKOUJ

DEPARTMENT OF ART

Leaving home for the first time is an important part in a person's life as they are removed from the comfort of their family and friends. For me, I was 'uprooted' from my home, Hawaii, to be here in San Diego. I created products focused on what made home so special and as reminders to others who were also uprooted to the mainland. These products were a calendar, informational map, matchbooks, and a T-shirt design. Design has been a positive vehicle to fill the emptiness I feel while away from home. The projects I have created, and more importantly, the process, has allowed me to direct my attention towards realizations. Realizations that where I come from has really shaped me into who I am today. I have taken some steps back in life, to look into my past, which has ultimately helped me to move forward.

FULLER'S GEODESIC BRIDGE

DEVON MORRIS

FACULTY ADVISOR: DANIEL LOPEZ-PEREZ

DEPARTMENT OF ART

Buckminster Fuller, the American architect well known for his series of geodesic spheres, had a plethora of designs and inventions, some though never made it off the drawing paper. Starting with just a few drawings of a dome design, I cut out pieces and formed a model. From there, I moved on to drawing what I believed the construct as a whole would look like, and then I applied it into the computer program Rhino – enabling a 3-dimensional version of the model. Using the basic cell that had constructed the dome, I put it together in a variation that created an arch. By varying certain aspects of the cells, different vaults can be formed. Finally, I used the original cell to formulate a new, Fuller-esque cover for the Maher-Immaculata Bridge on campus. There are many other unfinished designs of Fuller that the architecture department and myself are eager to attempt.

INSIDE OUT

ALEXANDRA NELSON

FACULTY ADVISOR: MICHAEL RICH

DEPARTMENT OF ART

The theme portrayed in my work is the relationship between female youth and the need to act and appear more mature in this current day and age. My purpose is to expose feelings that are being masked by heavy makeup and expensive clothing. This work fits in with a broader series I have been working on, concerning women growing up in affluent circumstances. This work is meaningful to me because I grew up in this type of environment, and I want to expose feelings that come with this lifestyle. I used 35mm color film as well as digital photography to create this work, and I used a flash. The flash adds a blown out, plastic-like effect to the subject which aids in making the girls appear more unrealistic. I will continue developing this work by photographing more females from their teens to early twenties and exposing certain truths.

SOCIETY AND THE INNATE DISCORD

ALEXANDRA NOEL

FACULTY ADVISOR: JOHN HALAKA

DEPARTMENT OF ART

What is left of human instinct after societal standards have bombarded our sense perception? The original inspiration for the theme of my mixed media series extended from this particular philosophical and psychological question concerning the discord between societal idealism and natural human behavior. My interest in the idea of innate human sensibilities conflicting with

communal ideology began with the topic of marriage; logically preceding the topic of pregnancy and birth. When deciding how to portray my idea of societal authority over innate human conduct, a particular image of a physically and mentally restrained veiled woman frequented my mind. I chose to combine black and white photographic self-portraits with oil painting techniques, aiming to create visually captivating images that reflect the conflict between society and nature. In terms of developing this series, I plan to explore new philosophical questions involving humans and the five senses through photographic and painting methods.

BODY OF CHRIST

NOE OLIVAS

FACULTY ADVISOR: JOHN HALAKA

DEPARTMENT OF ART

Influenced by culture and street art, Noe Olivas continues to push his limits by exploring the notion that “good art poses questions.” He challenges his viewers by confronting them with the traditional Catholic images of Jesus Christ. He presents Christ in an informal format of street art. Through his artwork, Noe attempts to break Christian traditions by bringing Jesus out of the churches into the modern-day scene. In this particular piece, each spray can represents an individual. The rust and the dents along the side of the cans symbolizes the imperfections and brokenness found physically and emotionally within humanity. Noe carefully placed the image of Christ on the top of the cans. This represents the full presence God in human lives. Only those truly aware of their brokenness can truly cherish grace.

NOVEMBER 18TH

KATHERINE POWERS

FACULTY ADVISOR: MIKE RICH

DEPARTMENT OF ART

“November 18th” is a process-based artwork that was handwritten in script using a fountain pen and ink. The project, in total, which consists of all of the articles in their entirety from the front page of the November 18th New York Times, took over fourteen hours to complete. The idea behind the piece was to take the accounts of one day and record them in a way that mimicked that of a diary or personal journal. Instead of the information written being more intimate and of one person’s perspective, the articles are purely factual and devoid of any real emotion. During the process of handwriting the piece, I tried to meditate on each word and sentence, taking care, as if the words were my own. The result is a contradiction of what the art of penmanship and personal reflection usually yield.

A CLOCKWORK REVISITED

ARMEEN SHAIDANI

FACULTY ADVISOR: SABA OSKOUI

DEPARTMENT OF ART

If a man is unable to make a choice, even if it is one of poor judgment that can negatively affect or harm others, is he still a man? *A Clockwork Revisited* is a digital artist book inspired by Anthony Burgess' 1962 novel, *A Clockwork Orange*. The story is a social commentary on morality and analyzes the topic of free will in humans. What is also a focal point is the value of said free will in regards to humanity, as well as how far we as humans can push the limit of control over another human being before playing God. The vivid, descriptive imagery of Burgess inspired me to create images of my own that serve as formidable complements to his words.

RESILIENCE

CASSIDY TRAPP

FACULTY ADVISOR: JOHN HALAKA

DEPARTMENT OF ART

My artworks seek to delve deeper than a nostalgic rendering and into the realms of mystery, neglect, and emptiness that these forgotten objects of leisure represent. The overwhelming forces of the natural world can effortlessly swallow something as substantial as an abandoned car. The American dream, to own your own home and live a comfortable lifestyle, is what much of our culture revolves around. But at what costs do these ambitions come? Can luxury goods really provide one with happiness? These are a few questions that I explore in my work. Above all, nature is the ruling class, yet, in order to control, confine, and take advantage of its resilient qualities we only hurt ourselves. My aim is to glorify nature's supple strength despite the obstacles man so readily provides it. At the same time, I seek beauty and transcendence in its workings and uncontrolled perfection.

BOXED IN

AMY YATES

FACULTY ADVISOR: DUNCAN MCCOSKER

DEPARTMENT OF ART

I am investigating the ambiguity of the box as a metaphor. These photographs are about reaction to restricted space. My subjects may appear to be "boxed in" and trying to escape as if from a cell or a trap (or resigned to their condition), and yet simultaneously this enclosure seems to provide shelter and protection and can be seen as a type of armor, a protective shell. My subjects are nude, making them extremely vulnerable and uncomfortable, a condition enforcing the ambiguity of the box being either their sole protection or their solitary confinement.



internship

INVISIBLE CHILDREN: A SOCIAL, POLITICAL, AND GLOBAL MOVEMENT

JOE BELLO

FACULTY ADVISOR: GARY GRAY

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Invisible Children, Inc. is a San Diego based non-profit aimed at exposing and ending Africa's longest running war of 23 years in northern Uganda. Through the power of media, awareness, and grassroots political advocacy, Invisible Children aims to create lasting change through education and continued awareness. I postponed my college career, and took a year in 2006 to travel across the United States, sharing the story of child soldiers to thousands, and saw first hand how a single story could ignite individuals to action. Since then I have continued to lend my support. I will continue this semester with coordination of the organization's local fundraiser events, including a music festival at USD, as well as continued political advocacy. I will also be researching the ongoing conflict in the Democratic Republic of Congo, one of the worst humanitarian crises in the world, establishing the possibility of future involvement in the conflict-ridden area.

VISTA HILL 501(c)(3)

KATIE NOBEL

FACULTY ADVISOR: GARY GRAY

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Vista Hill is a 501(c)(3) non-profit that offers programs and seeks to rehabilitate mothers and families. Clients of Vista Hill attend groups that deal with sobriety, relationships, domestic violence, parenting, job preparation, and health. My work with Vista Hill will help to prepare for a career in the non-profit sector. I am specifically concerned with women's issues, and working with these women will allow me to understand what policy changes need to be made to help women avoid poor life choices. I am also interested in how to run a non-profit organization and create effective policy. My duties include attending group therapy sessions with the women, working on an upcoming food drive, and observing the grant writing process and administrative aspects of the organization. I hope that my experience here will allow me to fully understand what it takes to help people via the non-profit sector.

KNBC NEWSROOM INTERNSHIP SUMMER 2009

RON REZEK

FACULTY ADVISOR: GARY GRAY

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Over the summer of 2009, I interned in the newsroom of KNBC in Los Angeles. I spent 30-40 hours a week working for Conan Nolan, the stations political beat reporter. By the end of the summer I had improved my writing and interviewing skills tremendously, to a point where Conan was confident enough to send me out on my own with a camera crew. Aside from learning more about the business of broadcast news, I learned more about California and local Los Angeles politics in those three months than I have in the past four years studying political science in college. I tried to give 110% all the time; my efforts were rewarded with a job offer to come back once I graduate.

THE PERSONALIZATION OF GOVERNMENT THROUGH THE EYES OF A CONGRESSIONAL INTERN

HANNAH SADLER

FACULTY ADVISOR: GARY GRAY

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

California Congressional District 53 includes over 600,000 constituents, constituents that supply their representative, Congresswoman Susan Davis, with an endless stream of complaints, praise, suggestions, and pleas for assistance. As an intern in the district office, my primary responsibility is answering phone calls to make sure that each constituent receives personal attention and, at the very least, has their comment logged. With a phone call and a district zip code, each constituent is introduced to a staff liaison who will guide him or her through interactions with any federal agency. This internship will immerse me in the legislative process and the game of politics and prepare me for a career in law. I hope to learn as much as possible about immigration laws and the naturalization process, health care reform, the machinery of federal agencies, labor unions, and serving a diverse district through representation and delegation.

SEXUAL ASSAULT FELONY ENFORCEMENT (SAFE) TASK FORCE FOR THE DEPARTMENT OF JUSTICE

ANNA SAVINO

FACULTY ADVISOR: GARY GRAY

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

For the past year, I have been interning with the Sexual Assault Felony Enforcement (SAFE) Task Force, which is a group of law enforcement agents working together for the Department of Justice (DOJ). Through training, monitoring, public 290 notifications and investigations, the mission of

SAFE is to diminish sex crimes and sexual motivated crimes in the areas of San Diego County and apprehend the responsible offenders, thereby increasing public safety. My role as an intern includes clerical duties, including putting together case and fugitive files, entering audit results into a database, collecting and posting monthly statistics to DOJ headquarters, and working to make sure the grant that funds SAFE is up to date. As a member of SAFE, I have been able to see all sides of the investigation and prosecution process and will take my experiences with me as I start law school in the fall.

ASSEMBLYMAN NATHAN FLETCHER

ELIZABETH SMUTZ

FACULTY ADVISOR: GARY GRAY

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

INTERNSHIP SUPERVISOR: LORI CARRILLO

ASSEMBLYMAN NATHAN FLETCHER DISTRICT OFFICE

I am interning for the assemblyman for California's 75th district, Nathan Fletcher. Assemblyman Fletcher was elected to office in 2008. He will be up for reelection this coming November. As an intern, I serve under the district office's field representative who is accountable to the district director and the chief of staff in the capital office. As an intern, most of my duties involve constituent correspondence. Most often, I am sorting through and drafting replies to e-mails or answering the phone. However, I am given the opportunity to attend community events as well. I chose this internship in order to become more knowledgeable about the legislature and to learn hands-on about what "special" interests legislative offices might face and how individual constituents may influence their representative. After I graduate this May, I plan to move to Sacramento to become more involved in the policy side, rather than constituency, of politics.

INTERNSHIP WITH CONGRESSMAN DUNCAN HUNTER

KIMBERLEY THOREN

FACULTY ADVISOR: GARY GRAY

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Seeking a practical way to apply my political science major and look at possible job paths within that field, I chose to intern with Congressman Duncan Hunter. I decided to work for Congressman Hunter to explore the experience of a first term congressman and because we share the same political views. The goal of Congressman Hunter is to represent the people of the 52nd District of California and ensure that their views are reflected in his actions in Congress. As an intern, I saw firsthand how a congressman's office is run, what services he provides to his constituents, and what the day-to-day life of a congressman looks like. My role was to provide support to Congressman Hunter's staff through answering phones, writing letters, and assisting them with other various projects, such as compiling data on the Chambers of Commerce in the district.

The image features a complex, abstract composition of overlapping, semi-transparent blue rectangles of various shades and orientations. A network of thin white lines forms a grid that intersects these rectangles, creating a sense of depth and structure. The overall aesthetic is clean, modern, and technical.

research

GREENPEACE'S SORRY SOLICITATION METHODS

ASHLEY ADAMS, CHRISTINA BERTOCCI, CHRISTINE BOYICH, ELIZABETH MASON

**FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES**

Greenpeace's mission statement clarifies their goal to "use peaceful direct action and creative communication to expose environmental problems and to promote solutions for a green and peaceful future." In order to suggest more effective strategies, Greenpeace volunteers stationed outside of Target and Trader Joe's were both observed and interviewed to gain insight into their recruiting and solicitation techniques. Surveys were created from both the observations and data collected. The surveys help to determine the effectiveness and attractiveness of Greenpeace's aggressive solicitation and recruitment strategies. Research and observations have established that Greenpeace uses strategies that are less effective than the techniques supported by our hypothesis that individuals respond better to different techniques than are currently being used.

THE SKY IS THE LIMIT

BRITTANY ADAMS, KAITLYN JOHNSON, MORGAN HENDERSON, TAYLOR LAWRENCE

**FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES**

United Way of San Diego County is committed to "advancing the common good by creating opportunities for a better life for all." The organization's main focuses are education, income, and health. The education aspect strives to help children grow physically and mentally stronger; the income aspect teaches families how to become more financially stable; and the health aspect focuses on providing proper health care to all. These three aspects of life are important to everyone within a community and are significant in achieving one's success. The public can choose to donate to one of these three focuses (specifically) in order to support an aspect of United Way's mission. Our goal is to find out which one of the three aspects is in the most need of financial support from its donors and to determine a strategy that would motivate people to donate more to this focus.

THE PURPLE PHOTOSYNTHETIC BACTERIA: RHODOSPIRILLUM CENTENUM AND PLEIOMORPHY

KENT AKIN

FACULTY ADVISOR: TERRY BIRD

DEPARTMENT OF BIOLOGY

Under variable environmental conditions, the purple, nonsulfur, photosynthetic bacteria, *Rhodospirillum centenum*, is capable of morphological adaptations from encystment to biofilm and flagella formation. In liquid culture, *R. centenum* grows as vibrioid-shaped, vegetative cells that possess a polar flagellum. When introduced to solid surfaces, the bacteria transforms into swarm cells distinguished by their elongated shape and numerous lateral flagella. Swarm cells are capable of swarming motility across a substrate. The pleiomorphic capabilities of swimming and swarming were characterized in two cyst defective strains (Δ cyd1 and Δ cyd2) relative to the wildtype strain. On semi-solid media, Δ cyd1 appeared to swim comparably to wildtype whereas Δ cyd2 swimming cells were less dense. On solid media, Δ cyd1 swarm cells appeared to differentiate at a slower rate with lesser density when compared to wildtype whereas Δ cyd2 swarmed earlier and with greater mass than wildtype. The ability to swarm correlated with the abundance of lateral flagella.

EPISTEMOLOGICAL BELIEFS PREDICT CHANGES IN STUDENTS' MISCONCEPTIONS

DANIELLE AUSTIN, ANDREW AMBAT, DANIEL MATHIAS, TRACY VARGO

FACULTY ADVISOR: ANNETTE TAYLOR

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

The purpose of our study was to evaluate whether students with more sophisticated epistemological beliefs would engage in more critical thinking, resulting in a greater likelihood of changing false misconceptions about psychology. The sample was composed of 38 introductory psychology students who completed a pre-test and post-test assessing student misconceptions of psychology, a critical thinking assessment, a measure of effort, and a measure of epistemological beliefs. The results showed that epistemology predicted both change for misconceptions to correct conceptions and critical thinking. Critical thinking predicted effort and change for misconceptions. Effort predicted change for misconceptions. These results suggest that students who believe that knowledge is not fixed, and who are better critical thinkers are more likely to change misconceptions.

EFFECTIVE COMMUNICATION SKILLS FOR NONPROFIT FUNDRAISING

KELLY AYRES, JESSICA HUSSON, STEPHEN MARIUCCI, TIM MACHADO

FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES

Different individuals were contacted through various methods to test which fundraising techniques were effective in raising money for the organization. We compared the effects of two different approaches on the willingness of subjects to donate money to the organization. In the first, we tested groups using statistics and a data-based approach. In the second, we used a more narrative, emotion-centered approach. Both approaches were conducted with face-to-face communication practices. The results will be concluded based on which approach generated more fundraising money for the organization.

COMPUTATIONAL STUDY OF THE STABILITY OF ORTHO-SUBSTITUTED PHENYLBOROXINES TOWARDS HYDROLYSIS

LORENZO BAUTISTA

FACULTY ADVISOR: JEREMY KUA
DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

One strategy of protecting phenylboroxines towards hydrolysis is to add steric groups in the ortho-position of the phenyl ring. This forces the phenyl rings to rotate perpendicular to the plane of the boroxine (B₃O₃) ring putting these groups above and below the boroxine core potentially blocking the access of water. We have used density functional theory to calculate the torsional energy curves to rotate the B-C bond between the boroxine and phenyl groups. These results were used to parameterize a reactive force field to model the interactions of phenylboroxine in water. We present our quantum chemical data and molecular dynamics simulations to evaluate the strategy of using bulky groups in the ortho-position to protect against hydrolysis.

THE ERGONOMICAL CRUTCH/CANE

DEEP BEDI, JAVVAD SYED, DAVID CARDINALE

FACULTY ADVISOR: LEONARD PERRY
DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

According to data taken by Disability Statistics Center from the University of California, San Francisco, 70% of mobility device users use a cane/crutch. The current crutch design we have today is from WWII. They are very uncomfortable, and inflict more pain and damage than they actually help. They send forces back into the joints and this is especially painful for those with arthritis or other joint problems. The new design of the crutch/cane will be re-designed ergonomically. It will displace the weight evenly throughout the whole arm and have a shock

system to absorb and prevent forces from being re-directed into the joints. It will also help maintain proper posture. With the benefits of the new design, our customers will save more money in health care costs, as it will help prevent further harm caused by crutches.

CHANGING MISCONCEPTIONS THROUGH REFUTATIONAL READINGS

SIDNEY BENNETT

FACULTY ADVISOR: ANNETTE TAYLOR

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

The purpose of this study was to examine the relative effectiveness of refutational text and standard text in changing psychological misconceptions under controlled experimental conditions. Sixty-four students completed a 16-item questionnaire over common misconceptions, assessing accuracy and confidence in responses both before and after a set of readings. They then received readings equated for length and readability for eight common misconceptions in either standard or refutational format. Participants were generally more confident in their answers after reading the refutational text. Average normalized gain scores showed minimal gain (.122) for a no-reading control condition .559 for standard reading and .768 for refutational reading, resulting in a significant main effect of text type. Planned comparisons showed all readings types were significantly different from one another. Thus, refutational texts were more effective than standard texts in correcting misconceptions.

AURELIN: A UNIQUE ANTIMICROBIAL PEPTIDE WITH ANTIBIOTIC POTENTIAL

SEAN BEPLATE

FACULTY ADVISOR: HUGH ELLIS

DEPARTMENT OF BIOLOGY

When Aurelin was isolated from *Aurelia aurita*, it was the first antimicrobial peptide (AMP) to be obtained from a cnidarian organism. Found in the metabolically inactive mesoglea of *Aurelia aurita*, Aurelin is a unique AMP in terms of its structure. Aurelin is unusually small, consisting of only 40 residues, and it is not homologous to any other discovered AMP. Radial diffusion assays found Aurelin to be active against both Gram-negative *Escherichia coli* and Gram-positive *Listeria monocytogenes*. (Ovchinnikova et al 2006) It is hypothesized that Aurelin functions similar to identified toxins that block potassium channels. In addition to exploring the functioning of Aurelin, this project seeks to find any possible antibiotic applications.

PANTS ASSIST

AMANDA BERLINSKY, SULAIMAN ABANUMAY, TIFFANY MENDOZA

FACULTY ADVISOR: LEONARD PERRY

DEPARTMENT OF MECHANICAL ENGINEERING

By interviewing various senior citizens, there was a common theme of back and joint pain. This project will be focused on relieving some of the pain by addressing the action of putting on a pair of pants, which requires bending the back and knees, and may also require some balance. Due to technological limitations and restrictions, the use of electrical components will be minimal. The end goal of this project is to reduce some of physical stresses on senior citizens while maintaining the independence of completing everyday tasks.

CHARACTERIZATION OF PUTATIVE POLYMERIC IMMUNOGLOBULIN RECEPTORS IN LOWER VERTEBRATES

BRITTNEY BEYER, JENNIFER DRIGGERS, ARNOLD PALACIOS, KRYSTIAN BONILLA

FACULTY ADVISOR: VALERIE HOHMAN

DEPARTMENT OF BIOLOGY

The immune system protects organisms from pathogens and other foreign substances. In vertebrates, many of these pathogens enter an organism through the mucous membranes that line their respiratory and gastrointestinal tracts. Antibodies in mucous protect vertebrates against these pathogens and foreign substances. The polymeric immunoglobulin receptor (pIgR) is a transmembrane protein that mediates the transfer of antibodies into mucosal secretions. We are seeking to identify pIgR in lower vertebrate species. We are using PCR to amplify potential pIgR cDNA from the little skate, bullfrog, and channel catfish. To determine if we have obtained pIgR cDNA, we will compare our sequences to other pIgR sequences in the GenBank database and also examine their expression patterns in a panel of tissues. Thus far we have obtained from the little skate partial cDNA sequence that encodes a transmembrane protein with at least one immunoglobulin domain. We are pursuing the remainder of this sequence.

EMERSON AND THOREAU ON SELF-RELIANCE AND TRANSCENDENTALISM

JOHNNY BOBÉ II

FACULTY ADVISOR: IRENE WILLIAMS

DEPARTMENT OF ENGLISH

As the architect of the Transcendentalist movement and resulting culture, Ralph Waldo Emerson established the framework for this truly American literary and philosophical revolution. Henry David Thoreau, has come to embody as well as exemplify the American Transcendentalist movement. Using Emerson's essay entitled *Self-Reliance* to establish a perspective on transcendentalist reform, this project intends to examine how Thoreau's literary works of *Walden* and *Civil Disobedience* responded, adapted, exemplified, modified, and diverged from concepts put forth by Emerson in his respective essay. Emerson critiqued, refined, and praised Thoreau's work. In *The Eulogy of Henry David Thoreau* written by Emerson himself, Emerson elaborately details the mastery and shortcomings of Thoreau as a person, writer, and contributor to the Transcendentalist movement. This project analyzes both independently as well as from Emerson's own view the work of Henry David Thoreau in the context of the philosophical as well as Transcendentalist view of *Self-Reliance*.

ANIMAL SHELTERS AND THE ECONOMY: EFFECT OF BUSINESS CYCLE ON EUTHANIZATIONS

JULIANNE BONAHER

FACULTY ADVISOR: ANDREW NARWOLD

DEPARTMENT OF ECONOMICS

With a declining economy, humans are not the only ones affected. Animal shelters have experienced a huge increase in the number of abandoned animals, which has led to an increase in the number of animals euthanized. This study investigates the relationship between the number of euthanized animals at the San Diego County Central Shelter and fluctuations in the economy. An Ordinary Least Squares equation is estimated using monthly data from January 1995 through December 2009. This study looks at how changes in consumer price indices, the San Diego unemployment rate, and the stock market relate to the number of euthanized pets. The hypothesis is that when the economy is down, the number of euthanized animals would be higher. Future research could be done, based on the results, to find minimizing strategies for the shelter's euthanization procedures.

THE GRADUAL READING OF GERTRUDE STEIN: AN ANALYSIS OF STANZAS IN MEDITATION AND “MELANCTHA”

JACQUELINE BRACKEN

FACULTY ADVISOR: IRENE WILLIAMS

DEPARTMENT OF ENGLISH

Gertrude Stein is fresh. Her texts cannot be separated and analyzed through the typical traditions of particular genres, or even as unrelated pieces of text. The crux of her lifework, her writing, is a fluid examination of perception, observation, representation, language, genre, writing, and reading. Stein's work has often been ill received simply due to its unconventional or alternative nature. Those who deem her work as “nonsense” or “incomprehensible” illustrate the necessity of a prerequisite when reading Stein: “Gertrude Stein spectacles.” The Stein reader must outfit his or herself with a lens that will bring into focus the connections between her comprehensible and “incomprehensible” writings. In order to expose the freshness of her voice, I will examine *Melanctha* from *Three Lives*, published in 1909, as a way to define and equip a Stein reader with the spectacles he or she may need to enter *Stanzas in Meditation*, published in 1932.

UNDERSTANDING THE CONTRIBUTION OF THE N-TERMINAL DOMAIN OF HAT1 TO HISTONE SUBSTRATE BINDING

RYAN BRENNAN

FACULTY ADVISOR: ROBERT DUTNALL

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Compaction of DNA into chromatin plays an important role in control of gene expression. Histone acetyltransferases can alter chromatin structure by modifying the histone components of chromatin. Our aim is to understand the molecular basis for specificity of the histone acetyltransferase Hat1. The structure of a Hat1-histone peptide complex has revealed contacts between the N-terminal domain of Hat1 and part of the histone peptide. To investigate the significance of the contribution of these contacts to histone binding, we will compare the activity of Hat1 deletion mutants lacking the N-terminal domain to the activity of the native Hat1 enzyme. These deletion mutants have been made through protein cloning, however the deletion mutants that have been generated so far are insoluble. Therefore, current work is focused on solubilizing and refolding the proteins. If this is successful I will compare their activity to that of native Hat1 using a spectrophotometric enzyme activity assay.

THE LIVED EXPERIENCE

CLARISSA BROWN

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DEPARTMENT OF PHILOSOPHY

Frantz Fanon, in *Black Skin/White Masks*, discusses discrimination due to skin color and how it affects all individuals, who must fight for the recognition of their humanity in a fully racialized society. The Antilleans, who were colonized by the French, experience a complete fracturing of the self when forced to reject their culture and adopt a new one. This fracturing caused the Antilleans to internalize societal structures of inequality, realizing they would never be accepted as members of French society. Fanon thinks that the Frenchmen forced the Antillean into a subhuman status but he argues the Antillean can escape the Frenchmen's trap if he recognizes that color does not ultimately form identity. Thus, this work shows that racialized identities, are not static but rather the ongoing result of larger political structures.

LOTTIA GIGANTEA DISTRIBUTION AND SIZE FREQUENCY IN THE ROCKY INTERTIDAL, CABRILLO NATIONAL MONUMENT

ELEANOR BROWN

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DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

Lottia gigantea, or Owl limpet, is an important gastropod in the rocky intertidal. At Cabrillo National Monument, California, the populations are protected from poaching which made this an ideal location for our study. We measured limpet size frequency distribution, growth rates and population density to determine how populations vary on different substrates (eroding sandstone vs. more stable igneous boulders). There was no significant difference between growth on the two substrates, but smaller limpets were more abundant on the boulders than at the sandstone sites. Population density in February 2009 was also 4x greater on the bolder sites than at the sandstone sites. The study indicates that the sites with larger individuals (70-75mm range) generally live on eroding sandstone and may be more susceptible to mortality from loss of habitat. These limpets are often lost to poaching at other sites along the California coast.

COLLEGE WOMEN'S OPINIONS ON ABORTION AND OTHER CONTROVERSIAL ISSUES IN AMERICAN SOCIETY

MARY CANNON

FACULTY ADVISOR: LISA NUNN
DEPARTMENT OF SOCIOLOGY

I conducted survey research on college women's attitudes on abortion, and how those attitudes relate to views on capital punishment, homosexuality, premarital sex, and euthanasia. The research found interesting and surprising results, including: more than 70% of those surveyed knew someone who considered having an abortion, and the majority of those acquaintances went through with the abortion. Additionally, 47% of those surveyed believe that the father's opinion is less important than the mother's in the decision to have an abortion. My presentation will demonstrate a wide range of findings comparing the attitudes of Pro-Life respondents to the attitudes of Pro-Choice respondents. For example, those who identified themselves as Strongly Pro-Life were more likely to be in favor of the death penalty, whereas people identifying as Strongly Pro-Choice were not overwhelmingly in favor or opposed to the death penalty. Also, Strongly Pro-Choice respondents were more than twice as likely to support euthanasia as compared to Strongly Pro-Life respondents.

ARISE, MY MINION! MAGIC AND FAMILIARS IN SHAKESPEARE AND MARLOWE

JOSEPH CAROTHERS

FACULTY ADVISOR: ABRAHAM STOLL
DEPARTMENT OF ENGLISH

Shakespeare's "The Tempest" and Marlowe's "Dr. Faustus" both feature familiars, supernatural minions bound to their master, as important plot devices executing the magician's will throughout the play. It is simple enough to see Prospero's white magic as a benevolent portrayal of magic and Faustus' power as a cautionary tale against the occult. However, the presence of the evil witch Sycorax allows Shakespeare to include black magic in his play, thereby complicating the issue and shedding light on the master/familiar relationship. I will present an argument that shows how each playwright uses this relationship to illustrate the belief that the morality of the occult tradition was determined by its adherence to the social order, exemplified by the great chain of being. Further research will include the addition of other sources, such as Ben Jonson's *The Alchemist* and Greene's *Friar Bacon* and *Friar Bungay*.

WHAT THE UNITED STATES CAN LEARN FROM THE SINGAPORE MATH PROGRAM

GILLIAN CATTEY

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DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

Since 1995, the Trend in International Mathematics and Science Study (TIMMS) has conducted research every four years to assess how students in 4th and 8th grade compare to those in other countries. Since 1995, the United States ranked about average compared to other countries, while the students in Singapore have always performed well on the TIMMS. Singapore's approach to mathematical instruction is very different than that of the United States. Since the results of the TIMMS in 1995 were released, the United States has been trying to improve their test scores by looking at the curriculum, textbooks, and framework of the mathematical instruction in Singapore. What is so different about Singapore's mathematic instruction, which is causing their students to become mathematical leaders internationally? What can the United States change about their instruction to not only improve test scores, but to produce international mathematical and scientific leaders?

CHARACTERIZATION OF POROUS Ti_6Al_4V STRUCTURES FABRICATED WITH ELECTRON BEAM MELTING FOR BIOMEDICAL APPLICATIONS

TIARA CHAPEL

FACULTY ADVISOR: RICK OLSON

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Through RP biomedical implants can be prepared through CT scans. One promising process to create these implants is by EBM. Unfortunately, parameters such as strut thickness, pore diameter, and even the porosity of the structure may change during fabrication. Characterization of the final prototype is necessary for optimal implants. By finding the input parameters that allow for output characteristics; the process will be able to predict the final prototype. This research project focused on the dimensions of the macroscopic structure as well as the surface roughness on the microscopic level. Both dimensional analysis and surface roughness was carried out using SEM. Surface roughness analysis was compared to see if input parameters allowed for a roughness that would allow for cells to proliferate and grow through the structure. For each characterization there was a set number of data values taken on each face of the structure, the values were taken at random.

SOURCE AND COMPOSITION OF CARBONATE SEDIMENT GRAINS IN A MANGROVE ENVIRONMENT, ST. JOHN, U.S. VIRGIN ISLANDS

CASEY CHAPMAN

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DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

In St. John, USVI, an unusual coral community is flourishing on the prop roots of mangroves in a shaded, turbid environment. The goal of my research is to identify the biologic source of carbonate grains in bay-floor sediments in order to evaluate whether these prop-root corals might be contributing to the overall production of carbonate sediments. Bay-floor sediment samples were collected along transects from the mangrove to the center of the bay and wet sieved into size fractions >500 μm and 250-500 μm . Grain bioclasts were identified, and point counted to 300 grains. The primary carbonate bioclasts found were echinoderms and Halimeda algae. The lack of abundant grains from the prop-root corals suggests that the corals are not contributing significantly to carbonate sediment production in the bay and/or the community has only recently colonized the location. This information is important in gaining an overall understanding of this unique coral habitat.

BIOINDICATORS OF CHEMICAL STRESSES IN BLUE CRABS (*CALLINECTES BELLICOSUS*) FROM BAHIA MAGDALENA

ASHLEY COBB

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DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Bahia Magdalena, in Baja California Sur, Mexico provides a perfect example of how human impact can stress the natural environment. Puerto San Carlos has a fish cannery that pollutes areas of the bay affecting sea life. To assess the anthropogenic impact of the cannery, blue crabs (*Callinectes bellicosus*) were collected from three different sites around the bay: the cannery (Conserva-Cal-Mex), Las Dunas, and Estero de Muerto. Exposure to pollutants causes organisms to express proteins to alleviate the stress, including metallothionein-like proteins, glutathione s-transferase and cytochrome P450; these will be assayed in six different crab tissues. Protein activity in crab tissues is hypothesized to be higher in areas of greater pollution. This study will compare crabs collected in July 2008 and 2009 from these sites. Since crabs are mobile, the results appear to demonstrate short-term biological responses, as opposed to metal bioaccumulation in crab tissues that show a more long-term exposure.

NMR SOLUTION STRUCTURE OF AN ACTINOMYCIN D:DNA COMPLEX CONTAINING A NON-HYDROGEN BONDING PAIR IN THE BINDING SITE

SHANNEN CRAVENS, ALYSSA NAVAPANICH

FACULTY ADVISOR: TAMMY DWYER

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Solution structures of two DNA oligomers in complex with actinomycin D (ActD) are presented. ActD targets the DNA sequence 5'-AAGCTT-3' via intercalation at the GC step and hydrogen bonding between the ActD peptide rings and functional groups lining the minor groove of DNA. 2D ¹H-NMR data were used to generate distance restraints defining the structures of ActD with the DNA duplexes d(CCAAGCTTCC):d(GGAAGXTTGG), where X = T (thymine) or F (difluorotoluene), a non-hydrogen bonding thymine mimic. NMR-derived distance restraints (336 for GT:ActD and 296 for GF:ActD) were applied in molecular dynamics calculations using a continuum solvent model, yielding structures with rmsds for the ligand and binding site of ≈ 1 Å. The complexes show some distortion of the DNA in the binding site typical of other ActD:DNA complexes. Interestingly, the intercalator of ActD binds the GF containing site in an opposite orientation (flipped 180°) relative to the GT containing site.

MECHANISM OF TRIAZINE FORMATION FROM NITRILE TRIMERIZATION CATALYZED BY ZnCl₂

ELIZABETH CUMMINGS

FACULTY ADVISOR: JEREMEY KUA

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Density functional theory calculations, including a Poisson-Boltzmann implicit solvent, were used to study the trimerization of terephthalonitrile to form aromatic polynitriles with triazine cores. We have outlined the thermodynamic and kinetic landscape by calculating the potential intermediates and transition states along the reaction coordinate, and suggesting how ZnCl₂ catalyzes the reaction. This reaction is particularly interesting because these monomers self-assemble into microporous covalent organic frameworks that are thermally stable and have a potential range of interesting applications.

COMPARATIVE PHYLOGEOGRAPHY AND POPULATION DEMOGRAPHY OF THE SEED BEETLE GENUS *STATOR*

BRIAN CURRAN

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DEPARTMENT OF BIOLOGY

Insects in the seed beetle genus *Stator* show significant differences in niche breadth: some are extreme specialists, others moderate specialists, and still others extreme generalists. In addition, species range from having very narrow geographic ranges to having ranges that span from Venezuela to California. I present results on how these factors interact to shape both the distribution of alleles across multiple species (phylogeography) and shape the demography of populations from an evolutionary perspective. Data from both a nuclear and mitochondrial gene provide insights into the prominent mode of diversification and ecological evolution within this genus.

COBALT SUBSTITUTION IN PSAO RESTORES ACTIVITY

KAITLYN DANG, JENNIFER NGUYEN

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DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Copper Amine Oxidases (CAOs) are proteins that oxidize amines to aldehydes and simultaneously reduce molecular oxygen to hydrogen peroxide. To carry out this reaction, CAOs contain two cofactors: topaquinone (TPQ) and a copper (Cu^{2+}) ion. Our lab is currently investigating the path of electron transfer in Pea seedling Amine Oxidase (PSAO), and the role of the copper ion in this protein. In one possible mechanism, the Cu^{2+} accepts an electron from TPQ, becoming Cu^{2+} , and transfers it to oxygen. In an alternative mechanism, electrons could be transferred directly from TPQ to oxygen without the need to reduce the copper ion. In order to determine which mechanism is active in PSAO, we replaced Cu^{2+} with Co^{2+} . Initial characterization of CoPSAO shows that it is active for catalysis, suggesting that electrons are transferred directly from TPQ to oxygen without reduction of the copper ion.

TEMPORAL AND SPATIAL VARIATION IN SEDIMENT TEXTURE ON CORAL REEFS, U.S. VIRGIN ISLANDS

AMALIA DEGROOD

FACULTY ADVISOR: SARAH GRAY

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

Previous studies have shown that fine-grained sedimentation is most detrimental to corals. The purpose of this study was to evaluate factors affecting the texture of sediments impacting coral reefs below developed and undeveloped watersheds in St. John, U.S. Virgin Islands. The textural parameters (grain size distribution and % clay, silt and sand) of sediment trap samples collected every 3 weeks between 8/08-3/09, were determined using a Beckman-Coulter LS200 Laser Particle Sorter. The mean grain size within the bays was finer at reef traps compared to shore traps, and the % clay by weight was greater on the reefs compared to shore sites. Sediment fluxing onto the reefs in the bays below developed watersheds was generally finer and contained more clay than sediment from reef locations below undeveloped watersheds. There was also a significant relationship between the % clay and total flux in the developed bays but not in the undeveloped bay.

STABLE GARDEN ASSISTANT

LUMA DESAUTEL, VERONICA MOLINA, ANASTACIA BRONNER

FACULTY ADVISOR: LEONARD PERRY

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Senior citizens from Bayside Community Center that we interviewed expressed a need for a comfortable and stable gardening chair. Many seniors suffer with physical limitations and disabilities. Currently, there are stools available for gardening, but most are unstable for use by senior citizens. We are creating a lightweight comfortable chair in which seniors can sit at a non-bending position, avoiding chronic pain and discomfort while gardening. The chair will offer back support and contain a lightweight, water-resistant frame with storage on each side of the chair for tools and personal items. This chair will make it possible for seniors and people with disabilities to enjoy gardening comfortably.

ANALYSIS OF TRACE METALS IN CLAMSHELLS FROM THE COMMON WHITE CLAM (*CHIONE CALIFORNIENSIS*) FROM MAGDALENA BAY

DENISE DO

FACULTY ADVISOR: JAMES BOLENDER

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Anthropogenic sources in Puerto San Carlos, Baja California Sur, and the use of Magdalena Bay for commercial purposes have led to trace metal contamination in the region. This contamination can affect organisms living in the bay, as they are exposed to and can accumulate trace metals in their tissues. Consequently, any trace metals in tissues can be found in the shell of an organism, as tissues are involved in the biomineralization process. This project determines the trace metal concentrations (Cu, Cd, Zn, Ni, Mn, Pb) in shells of the common white clam (*Chione californiensis*) found in the bay by graphite furnace atomic absorption spectrometry (GFAAS). Results will be presented for Cu, Mn, and Ni. Thus far, higher concentrations of Cu are seen at impacted sites than reference sites. Further studies will include analysis of all metals for shells from 2007 and 2008, and statistical analysis of these data sets.

METAL AFFINITY OF FERRIC UPTAKE REGULATOR HOMOLOGUES

MICHELLE DOMINGUEZ, JOURDAIN ARTZ

FACULTY ADVISOR: STEPHEN MILLS

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Our research is focused on understanding how metal selectivity is produced in the Ferric Uptake Regulator (Fur). Fur is a repressor protein found in bacteria cells that when activated by iron, binds to DNA and blocks transcription of genes that promote iron intake. Our lab has successfully cloned and expressed Fur from several organisms, including *Shewanella oneidensis* and *Pseudomonas aeruginosa*. Using metal titration methods, the affinities of the different homologues were measured for various metals, including Co(II), Mn(II), Zn(II), and Fe(II). Using surface binding assays, we determined the affinity of each Fur homolog for DNA with different metals bound. These affinities, used in conjunction with the sequences of the proteins, were used to identify the amino acids that may be important for metal selectivity in Fur.

HUMAN POWERED VEHICLE

LAUREN DORUTH, MICHAEL JAROSINSKI, JEFFREY BENTZ

FACULTY ADVISOR: DAVID MALICKY

DEPARTMENT OF MECHANICAL ENGINEERING

The Human Powered Vehicle Competition is an annual collegiate event sponsored by the American Society of Mechanical Engineers (ASME). This event challenges students to design and construct an aerodynamic human powered vehicle that must include rollover protection, an efficient braking system, the ability to execute a 25-foot turning radius, a partial or complete fairing, and adjustability for riders of different sizes. The vehicle represented by the University of San Diego in the competition is a single-beam frame design with a short wheelbase configuration strong enough to withstand testing and prolonged riding while also being lightweight. The design includes a complete fairing made of shrink wrap around a skeletal shell which also incorporates a rollover protection system. The over seat steering system is similar to current recumbent bicycle designs. However, the steeper head angle of the steering axis gives the vehicle a lower profile, allowing the vehicle to achieve higher speeds.

POPULATION DYNAMICS OF *E. ANALOGA* OFF THE CALIFORNIAN COAST

ALLISON DURLAND

FACULTY ADVISOR: NATHALIE REYNS

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

The Pacific mole crab, *Emerita analoga*, is an important component of sandy beach food webs. In this study, we analyzed how mole crab populations changed on spatial and temporal scales at nineteen sites along the California coast. Data were collected using cores taken along a 50 m transect in conjunction with the LiMPETS Monitoring Program. For most sites, an increase in the abundance of females with eggs was followed by an increase in abundance of recruits. These peaks in abundance varied temporally between sites north and south of Point Conception, suggesting that the timing of reproduction may be controlled by environmental conditions.

RESEARCH FOR RACHEL'S HOUSE: AIDING LOCAL AREA WOMEN THROUGH SOCIAL RESEARCH METHODOLOGY

CASEY EDWARDS, SHAYLYN RILEY, ALEXANDRIA SUCCA

FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES

In this study, USD students were encouraged to make donations for Rachel's Women's Center, a local non-profit women's shelter, through a variety of marketing and compliance gaining strategies. In one experiment, students were notified of a fundraiser at USD through marketing materials placed on campus, and were given no additional incentives for donations. In another experiment using different marketing strategies, students were notified of a fundraiser that would offer a small incentive for any donations given. The number of participants and donations received for each fund-raising event were recorded in order to test and compare the effectiveness of the various advertising and compliance gaining methods employed. Study results not only provided tangible donations for Rachel's House in the form of goods and funds, but also raised awareness for the organization and provided valuable research data that may help Rachel's House increase donation and volunteer rates in years to come.

INVISIBLE CHILDREN: A VISIBLE MOVEMENT

RACHEL FISCHER, STEPHANIE KILLION, HEATHER MEIER, VICTOR SANCHEZ

FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES

Invisible Children is a global non-profit organization with roots in San Diego. The group is dedicated to raising awareness and freeing child soldiers who are abducted and forced to fight in war-torn northern Uganda. In a global effort to save Ugandan child soldiers, communication is an integral component for the dedicated team of Invisible Children. We believed that by testing recruitment strategies utilized by the Invisible Children Club at the University of San Diego, we could discover the most effective way for Invisible Children to spread its message and recruit more members on a college level. By surveying levels of anticipation for events such as screenings, lectures, club meetings, and more, we hoped to gather an idea of what draws college students to fight for a cause. The findings will be offered to the club and used in determining if this can be a successful method for enrolling new students.

SYNTHESIS AND CHARACTERIZATION OF COORDINATION COMPOUNDS

JENNIFER FLEISCHMANN, MICHAEL HARLANDER-LOCKE

FACULTY ADVISOR: DEBORAH TAHMASSEBI

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Most biological molecules have a handedness to them and other molecules recognize this handedness or stereochemistry. The preferential synthesis of one hand over another, stereoselective synthesis, is important biologically in reactions such as assembly of supramolecular structures, biomolecular recognition and enantioselective catalysis. It is important to be able to perform stereoselective synthesis to produce products that are biologically useful and relevant. The use of nonracemic chiral ligands has made stereoselective synthesis of coordination compounds more feasible. The ligands that we are studying contain chiral amino acids linked to asymmetric bipyridine units. Upon complexation with ruthenium, the stereochemistry and sterics of the amino acid may influence the isomeric composition of the complex. We are interested in better understanding what factors influence the isomeric composition so that enantiomerically pure complexes can be prepared in a predictive fashion. The isolation, characterization, and structural properties of several complexes will be presented.

PAN-INDIANISM AN EFFECT OF AMERICAN INDIAN BOARDING SCHOOLS

ROBERTA GARCIA

FACULTY ADVISOR: MICHELLE JACOB

DEPARTMENT OF ETHNIC STUDIES

This project examines an event in history that affected several American Indian communities, families, and individuals: the American Indian Boarding schools. The author uses the concept of pan-Indianism and examines the boarding school assimilation process, loss of culture, and abuse to analyze how colonization has affected American Indian communities. The literature was reviewed to understand the effects of boarding schools, such as: high dropout rates among American Indians, high rates of abuse that occur on Indian Reservations, and loss of important cultural traditions such as language and religious practices. The author concludes that American Indians were resilient in developing a new sense of community in the face of oppressive conditions encountered in the boarding school system. As part of the resilient coping strategies, American Indians adopted strategies such as using English to develop a Pan-Indian identity as a way to survive in the face of dramatic cultural and social changes.

OFF TOPIC AND MISUSE DETECTION

MATT GIGLI

FACULTY ADVISOR: ERIC JIANG

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

In this project, we apply various machine learning algorithms to develop an off-topic detection system that aims at effective recall and precision results. Our goal is to implement a system that uses the conceptual information retrieval technology known as Latent Semantic Indexing (LSI) to eliminate the dependence of misuse detection on term matching and emphasize a more conceptual relationship between queries and their intended retrieved material. While we currently are still in the process of testing and experimenting with our prototype system, we believe that the use of LSI in the system will greatly help enhance off-topic detection accuracy.

MODELING ECONOMIC BEHAVIOR: STOCHASTIC DIFFERENTIALS, EXPONENTIAL MEMORY, AND COMPUTER SIMULATION

JAMES GILL

FACULTY ADVISOR: LUKASZ PRUSKI

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

Mathematical modeling and computer simulation are powerful tools for the study of real world phenomena. I used the Ornstein-Uhlenbeck equation to model economic behavior. It is a stochastic differential equation with both random and mean-reverting factors. The equation was extended by adding an exponential memory component. In the first phase, I searched the 8-dimensional parameter space to find the optimal set of parameters that would produce the behavior of the model close to the real data. Using methods from differential calculus, probability and statistics, as well as computer simulation, a realistic model of behavior was obtained. In the second phase, the memory process was extracted from the real-life data and subtracted from the differential of the data. This produced distributions similar to those of the standard Ornstein-Uhlenbeck process, which confirms the realistic nature of the model. The project shows how random factors could lead to predictable behavior.

SNATCH 'N GRAB

RYLAND GILL, BRYAN REED

FACULTY ADVISOR: LEONARD PERRY

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Senior citizens have certain needs when it comes to everyday life. Simple tasks can become very difficult as we grow older due to degenerating conditions. Some seniors have difficulty moving up and down step stools to reach higher objects. By developing an easy-to-use grabbing device specifically designed with the elderly in mind, our group hopes to achieve a safer and more functional design that will make seniors with these issues feel more confident and safe to reach for items stored up high in grocery stores and in cabinets at home. The design should be simple, sturdy, and reliable. It should improve on the current designs that are difficult to hold and use.

CHINA AND AFRICA: AN EMERGING INTERNATIONAL PARTNERSHIP

ANDREW GORRELL

FACULTY ADVISOR: THOMAS REIFER

DEPARTMENT OF SOCIOLOGY

This project examines the burgeoning economic and political relationships between China and countries of Sub-Saharan Africa. In the past decade, China has not only radically expanded its trade, lending, and aid with Africa, it has done so in ways which are inconsistent with – and often contradictory to – the accepted practices of the World Bank, IMF and other western powers. Although condition-free aid and cooperation with oppressive and corrupt regimes have drawn a great deal of criticism, China counters that its position as a successfully developing nation puts it in a better position to foster sustainable, long-term growth in nations where “old school” strategies have failed. This project uses real-world data as well as arguments of differing ideological frameworks to determine that while China’s growing role in Africa poses many difficulties and dangers, it also presents a tremendous opportunity for both sides if it is properly managed.

THE 2008 ELECTION: DID THE MEDIA HELP ELECT BARACK OBAMA?

DANIELLE GRASSO

FACULTY ADVISOR: MICHAEL PFAU

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The media is always a prevalent force in presidential elections. Covering everything from campaigns to debates, the facts and the media's biases are sometimes combined to create the "truth" presented to the American people. Although similar to other elections in many ways, the 2008 presidential election had much more of an emphasis on the use of the media and its variety of outlets to promote candidates. This presentation will look into the mass media's endorsement of Barack Obama through the internet, television, and newspapers, while also evaluating if and to what extent this promotion had an effect on the results of the 2008 election.

THE SYNTHESIS AND STUDY OF RUTHENOCENE-BASED DIPYRRROMETHENE COMPLEXES

MICHELLE GRAU, JORDAN THOMAS

FACULTY ADVISOR: MITCH MALACHOWSKI

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Organic moieties called dipyrromethenes have become increasingly popular as donors to metal ions. We have synthesized a series of new organic molecules where we have combined the dipyrromethene portion to a ruthenocene fragment. These organic molecules have been complexed to metal ions such as copper and cobalt and the metal complexes have been characterized. As the ruthenocene already contains a metal ion (ruthenium), we now have complexes that contain two different metal ions. We have begun to study the properties of these complexes by looking at the communication between the two metals by using UV-vis spectroscopy and electrochemistry. We will discuss these results and compare them to what is known about our ferrocene-containing complexes.

THE BUILDING BLOCKS OF DEMOCRACY: ANALYZING DEMOCRATIC DEFICIENCIES IN THE MUSLIM WORLD

TARA GREENE

FACULTY ADVISOR: J. MICHAEL WILLIAMS

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The concept of democracy building has long been a subject of debate within the field of political science. This discussion centers around how democracies are created and sustained, and whether or not the principles of democracy can be universally applied. One interesting case in this debate is that of nations with majority Muslim populations. Of the more than 40 nations whose Muslim population exceeds 50 percent, only three, Bangladesh, Indonesia, and Turkey, are considered electoral democracies. This apparent lack of democracy has led to theories that attempt to explain the relationship between Islam and democracy, particularly in regards to their compatibility. This paper will explore three separate theories as to how democracies are built, whether it is dependent on the economy, institutions, or culture, in an attempt to discover which factors play a contributing role in the scarcity of democratic governments in these particular nations.

BEHAVIORAL AND VOCAL COMMUNICATIONS IN KILLER WHALES, AND A REVIEW OF AGONISTIC AND AGGRESSIVE BEHAVIORAL STUDIES

NICOLE GRIMAUD

FACULTY ADVISOR: DREW TALLEY

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

INTERNSHIP SUPERVISOR: ANN BOWLES

HUBBS SEA WORLD RESEARCH INSTITUTE

Killer whales (*Orcinus orca*) are highly social learners with studies showing they possess the ability to learn vocalizations from conspecific and non-conspecific species. Studies focusing on their vocal abilities are only attainable in controlled environments due to the many limitations when working with populations in the wild. This research is important in situations where individuals of different dialects are only found living amongst each other, or being housed with individuals of a different species, which is very rare. Thus it is important to utilize these resources while they are readily available. These controlled environments also provide the opportunity to study agonistic and aggressive behaviors between killer whales which are less observed in the wild. It has been believed that these behaviors are rare amongst killer whales, but there has been little research on this species as well as other odontocetes, therefore I have undertaken this topic for review.

THE REGULATION OF BUD AND DUCT FORMATION DURING LACRIMAL GLAND BRANCHING MORPHOGENESIS

ANASTASIA GROMOVA

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DEPARTMENT OF BIOLOGY

The lacrimal gland (LG) is a classic example of a structure that develops through branching morphogenesis. The epithelial bud initiation is regulated by restricted expression of FGF10. However, factors involved in LG duct differentiation are still undefined. In many branched organs including the LG, FGF10 has been shown to be expressed in a distinctive pattern at the tips of the buds. In contrast, FGF7 is uniformly distributed throughout the mesenchyme. Here we show that the isolated LG bud, exposed to FGF10 on a bead, extends towards the bead and produces a structure without branches but with defined bud and duct morphology. In contrast, beads loaded with FGF7 do not induce directional elongation of the bud, instead inducing a local growth of the bud with no distinctive duct morphology. Thus, FGF10 has at least two distinctive functions during LG development - regulating both bud induction and duct differentiation.

THE ROLE OF INTEREST IN CHANGING MISCONCEPTIONS

COURTNEY GRUENFELDER, DANIELLE SULLIVAN

FACULTY ADVISOR: ANNETTE TAYLOR

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

The purpose of this study was to see if popular misconceptions in psychology could be corrected through instruction, and whether individual difference variables would have an influence on the amount of change in misconceptions. We predicted that students with a higher level of interest in the subject would be more likely to change. Forty-four introductory psychology students took a misconceptions pre- and post-test as well as questionnaires to assess their level of interest, effort, and goal orientation. Results showed that interest, effort, and mastery were marginally correlated with task value. Given our small sample size, we cautiously conclude that if a topic is important and interesting, then an individual will put in the effort required to master the material and change their misconceptions.

A WEST SIDE SOLUTION

CHRISTINA HAGAMAN

FACULTY ADVISOR: MONICA STUFFT

DEPARTMENT OF THEATRE ARTS

The beginnings of warfare are mild at first: a boy being tripped up, or being sandbagged with a flour sack or even being spit on — all with overly elaborate apologies.

Even before the dialogue begins, the racial tension in West Side Story is palpable. Based on Shakespeare's Romeo and Juliet, it tells the story of star-crossed lovers set in 1950's New York. Within the sometimes tragic yet hopeful story spun by Arthur Laurents, are undercurrents of undisguised racism. Any person watching the 1961 film adaptation of the Broadway production can see the underlying racism in the warring street gangs. This may be West Side Story's greatest strength and its greatest weakness. By illustrating, yet not discussing the issues related to the racism displayed, West Side Story is ineffectual. My project will attempt to use the tenants of Social Psychology to uncover and discuss the racist undertones within West Side Story. Learning to discuss racism will lead us one step closer to finding a solution.

GREEN MANUFACTURING: PRODUCT ASSESSMENT BASED ON BIODEGRADABILITY AND CARBON FOOTPRINT

JUSTIN HALL

FACULTY ADVISOR: TRUC NGO

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

As the world becomes more environmentally conscious, companies search for "greener" ways to manufacture their products. A research team, consisting of an ISyE professor, an ISyE senior student, and a Nicaraguan-based surfboard manufacturer, investigates the eco-friendliness of an innovative surfboard product. The goal of this research is to assess and compare the biodegradability of different types of surfboards, and to evaluate the carbon footprint associated with the manufacturing process. The carbon footprint study is focused on the core component of the surfboard, whereas biodegradability experiments are performed based on an American Society for Testing and Materials (ASTM) standard. Test samples from the surfboards are treated under controlled composting conditions for 45 days. Sample's weight change, material hardness, and surface micro-images are monitored throughout the experimental period. Research results are intended to provide surfboard manufacturers with insightful information on product alternatives and their impact on the environment.

NOT MERE “COOKIE-PUSHING”: THE RELATIONSHIP BETWEEN DINING AND DIPLOMACY IN POST-WAR AMERICA

MARIE HARDING

FACULTY ADVISOR: KATHRYN STATLER

DEPARTMENT OF HISTORY

The connection between dining and diplomacy has often been dismissed as mere “cookie-pushing” – an endless succession of luncheons, receptions, and dinner parties for those in diplomatic life. However, I argue that there is great purpose such affairs. Isak Dinesen’s short story “Babette’s Feast,” the tale of a French chef who prepares a magnificent meal that brings peace to a feuding Norwegian village, presents a moving case for the usefulness of this relationship. While Dinesen artfully presents her work as a lighthearted foodie fable for the masses, the situational humor of clashing cultures around the dinner table underscores the importance and power of navigating foreign diplomats, foreign flavors and foreign manners, skills integral for peacemaking in the critical post-war period. I examine how post-war trends in diplomatic dining, American food culture and social standards are reflected and bolstered in “Babette’s Feast,” making it a model for peacemaking perfect for the American audience.

STRATEGIES FOR CLOSING THE TEACHING GAP: THE PREPARATION OF MATHEMATICS TEACHERS

KRISHELLE HARDSON-HURLEY

FACULTY ADVISOR: NORIYUKI INOUE

DEPARTMENT OF SCHOOL OF LEADERSHIP AND EDUCATION SCIENCES

It is no secret that American education is facing crisis. Many studies have compared American children to their counterparts abroad, showing strong evidence that American students are trailing far behind. This gap in achievement is principally evident in mathematics and science. Currently, public schools are leaving future American workers underprepared to serve the United States in maintaining itself as a productive and economically competitive nation in the global market. The reality of this crisis is that the average student in other countries, particularly those of East Asia and Europe, learns as much as the best students learn in the United States. This paper will focus on mathematics education and the steps that should be taken to improve the methods of teaching in order to ensure that our nation maintains its status as a competitive economic and political power.

DO PHYSICIANS LEGISLATE DIFFERENTLY ON HEALTH AND SCIENCE ISSUES THAN THEIR PEERS IN THE U.S. CONGRESS?

ASHLEY HARRINGTON

FACULTY ADVISOR: GARY GRAY

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Political representation can be characterized as either descriptive or representative. Descriptive representation holds that certain qualities about the elected official, such as age, race, religion, gender, and career, can affect voting behavior. This study investigated whether or not being a physician affected voting patterns in the U.S. Congress between 2003 and 2009. Does being a physician determine voting, or does party ideology ultimately guide legislative behavior?

EVALUATION OF BH4 SYNTHESIS IN *C. ELEGANS* THROUGH THE USE OF RNA INTERFERENCE

AMY HAUCK

FACULTY ADVISOR: CURTIS LOER

DEPARTMENT OF BIOLOGY

BH4 is an essential molecule that functions as a cofactor in the synthesis of several important neurotransmitters. A full picture of how this molecule is derived from its precursors is an important step in characterizing and understanding key elements of the nervous system. Accordingly, using the nematode *C. elegans* as a model organism, we will utilize RNA interference in order to study the function of several genes that may be involved in the synthesis of BH4. This method allows for the silencing of gene function in an organism, thereby giving clues to the necessity or lack thereof for the gene products in question. In particular, this study will target several short chain dehydrogenase genes in the hope of identifying a gene that plays a similar role to sepiapterin reductase (SR), a molecule involved in the last step in BH4 synthesis and for which no obvious *C. elegans* ortholog exists.

A SEPIAPTERIN REDUCTASE-LIKE ENZYME THAT POSSIBLY CATALYZES BH4 SYNTHESIS

NABEIL HAZU

FACULTY ADVISOR: CURTIS LOER

DEPARTMENT OF BIOLOGY

Sepiapterin Reductase (SR) is known reduce 7,8-dihydrobiopterin to produce tetrahydrobiopterin (BH4). BH4 plays a very important role in the synthesis of Serotonin, Dopamine, and Phenylalanine. The focus of my research is to find an enzyme in the model organism *C. elegans* that functions like SR to synthesize BH4. I will be working on short chain dehydrogenase (dhs) genes to see if a particular gene codes for an enzyme that functions like SR. This will be accomplished by using RNA interference with genetically engineered bacteria to silence dhs genes and observe the effect on functions requiring BH4.

ECONOMIC GIANTS AND GENDER EQUALITY IN THE FAR EAST: AN ANALYSIS OF CHINA

SARAH HEALY

FACULTY ADVISOR: YI SUN

DEPARTMENT OF HISTORY

The global community focuses on the external implications of China's 1978 market reforms, such as its economic threat to other states. However, it is equally important, if not more so, to examine the domestic impact of China's development on the status of women. It is well documented that as a country with a strong patriarchal tradition, China has had a long history of gender inequality. Modernization theory states that as countries industrialize, the growth in national income and expansion of the labor force will increase the educational and employment opportunities available to women, and thereby improve women's status. Thus, if modernization theory holds true, China may emerge not only as an economic giant, but as a country on the verge of a social and political breakthrough. An analysis of secondary sources and economic and survey data is conducted to determine whether economic development improves gender equality in China.

USING FERROCENE-BASED LIGANDS TO SYNTHESIZE MULTI-METAL COMPLEXES

TAYLOR HEPP, LINDSAY ROW

FACULTY ADVISOR: MITCH MALACHOWSKI
DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Our interest is in designing organic molecules with particular shapes. In order to do this, we have synthesized rigid organic molecules based on the ferrocene unit. These organic molecules were designed to have a shape that will lead to a cavity when complexed to metal ions. After preparation of the organic molecules, they were bound to metal ions such as cobalt, iron and copper. The complexes were characterized by a combination of elemental analysis, mass spectrometry and X-ray crystallography. From these results, we were able to determine whether our basic premise about building particular shapes into the ligand is transferred to the metal complexes. We will highlight our successes using these ferrocene-based ligands.

THE ROLE OF CONVERSATION TYPE IN HINDERING ATTENTION

SANDRA HOLMES-SURBECK, CORINNE WRIGHT, ALEXIS SELLETT, DESIRE BEAUMONT, DIVIJA ANIREDDY, KANDICE OCHELTREE, MAT GOLLEY

FACULTY ADVISOR: VERONICA GALVAN
DEPARTMENT OF PSYCHOLOGICAL SCIENCES

Considerable research has investigated how participating in a conversation affects a person. The current study builds upon this earlier research by investigating to what extent a conversation affects bystanders. Participants were subjected to either a one-sided or two-sided conversation while completing a word task. Participants were expected to be more distracted, and thus have a poorer performance on the word task, when overhearing a one-sided conversation. Although the results trended in this direction, they were not significant. Participants exposed to a one-sided conversation were also expected to score higher on a subsequent recognition task, recalling more of a one-sided conversation because they paid more attention to it. Future changes to the study include a longer word task, to make the word task more difficult, and a conversation topic that is more applicable to university students.

COMPARISON OF WATER TURBIDITY BETWEEN THE BAYS UNDER DEVELOPED AND UNDEVELOPED WATERSHEDS IN ST. JOHN, USVI

YI-CHEN HSIEH

FACULTY ADVISOR: SARAH GRAY

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

Water turbidity has been considered a the key factor causing coral bleaching because sediments blocks sunlight necessary for the photosynthesis of symbiotic algae found in corals. In St. John, U.S. Virgin Islands, the development of steep watersheds has increased substantially over the past decades. Development causes excess sedimentation and increased turbidity of water. We determined the turbidity of water by measuring the Total Suspended Sediments (TSS) in water samples from two developing bays and one undeveloped bay in St. John, USVI. We also measured the Suspended Organic Matter (SOM) in each suspended sample. We found that excess SOM is detrimental to corals. We will present results that show how TSS and SOM during 2008 and 2009 differ at bays under development and a bay that is undeveloped.

DESIGN AND SYNTHESIS OF A CYTOSINE ANALOG

MICHAEL HUGHES, MICHELLE GRAU

FACULTY ADVISOR: DEBBIE TAHMASSEBI

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

There are several interactions in DNA that are important to its overall 3D structure, such as hydrogen bonding and stacking between the DNA bases. Studying the relative roles of these forces is important for understanding the global structure of DNA and its interactions with other biomolecules. My research is focused on the synthesis of a DNA nucleoside similar to deoxycytidine, C, that lacks the ability to hydrogen bond. The nonpolar analog, called D, is a molecule in which the nucleoside base is substituted with a less polar compound that alters the hydrogen bonding ability while simultaneously keeping the shape and size quite similar to that of the natural nucleoside. Work towards the synthesis and characterization of nucleoside D will be presented and discussed.

SEXUAL EDUCATION — THE STUDY

HALLIE HUSTON, JEREMY HOWLAN, BRANDON MYERS, ZACHARY RIESCHE

FACULTY ADVISOR: JONATHAN BOWMAN

DEPARTMENT OF COMMUNICATION STUDIES

Our group is going to do our research project on the non-profit Planned Parenthood Association. There are two things that we propose to do for our quantitative research project: first we want to do different fundraising techniques to help the organization because they have been cutting back

on distribution of condoms and other forms of birth control methods. They are currently doing fundraising for the victims of the Haiti earthquake so whatever money we make we will give to the association to help their efforts. Along with the fundraising we will also be spreading awareness as advocates to college students about how important it is to have safe sex, how easy it is to use planned parenthood as a provider, and the openness of different grades to birth control methods (via distribution of free condoms) to college students here at the University.

SEW EASY: ERGONOMIC SEWING PEDAL

MICHAEL JAROSINSKI, JUSTIN HALL, TIARA CHAPEL

FACULTY ADVISOR: MING HUANG

DEPARTMENT OF MECHANICAL ENGINEERING

Sewing machines are operated with both hands holding the working material, while the needle speed is controlled with a foot pedal. These pedals are known to cause fatigue in the operator's ankles and legs. This problem increases with age and physical deterioration. Such problems limit the ability and duration for those sewing. This project aims to develop a more ergonomic speed control device that reduces the fatigue and soreness associated with traditional sewing pedals.

IDENTIFYING INSULIN-LIKE GROWTH FACTOR (IGF) IN YELLOWTAIL (*SERIOLA LALANDI*) FISH USING DEGENERATE PCR

SARAH JONES

FACULTY ADVISOR: CURTIS LOER

DEPARTMENT OF BIOLOGY

Insulin-like growth factor is an important protein in animal development, and in fish it is suggested to influence post-natal growth and muscle development. Physiological stresses such as diet or exercise have been shown to increase IGF expression, especially in the skeletal muscle. We want to look at the expression of IGF in yellowtail muscle and its effects on muscle growth; therefore we need to obtain the yellowtail IGF gene. The IGF gene has been sequenced in numerous species and it is a highly conserved protein. IGF from other organisms can be used to design degenerate primers for polymerase chain reaction (PCR) to obtain the IGF sequence in yellowtail. Using genomic DNA from yellowtail liver we will use degenerate PCR to amplify part of the IGF gene, then clone and sequence this DNA in preparation for future experiments.

EXPERIMENTAL STUDY IN EFFECTIVE EXPOSURE THROUGH DIRECT AND INDIRECT CONTACT METHODS

CARA JORGENSEN, JENNIE PAGE, JOEY SHOEN, NATALIE NEWMAN

FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES

University of San Diego students were contacted using five separate methods in an attempt to gain participation in the Parkinson's Disease Association of San Diego's annual 5K walk "Step-by-Step." Students were approached through direct contact using the following methods: recruiter hosted booth on campus, individually positioned recruiters with clipboards and information but no flyers, and lastly through individual recruiters with available flyers. Students were approached through indirect contact using flyers posted on campus and a Facebook open-event invitation. Results will be gauged in each situation based on interest demonstrated through a request of more information. Based on the demographic, we expect the more indirect contact methods to prove more effective than direct contact between the recruiters and students.

MONITORING YOUNG STARS WITH PROTO-PLANETARY DISKS

MEGAN KACHIGAN

FACULTY ADVISOR: DAVID DEVINE
DEPARTMENT OF PHYSICS

Young stars and their associated proto-planetary disks of dense gas have been detected with space-based infrared observations of star forming regions. Most of these stars are too embedded in their host molecular cloud to be optically visible. Dr. Devine and I obtained optical images of these star-forming regions using the 36-inch telescope at Kitt Peak National Observatory in January 2010. I will compare our images with the space-based images to determine a set of young stars that can be monitored from the ground. Our eventual goal is to track accretion activity that may be correlated with the formation of planets in the disk that surrounds the young star.

FUNCTIONAL GENOMICS OF DHS GENES IN *C. ELEGANS* WITH PCR CLONING INTO AN RNA INTERFERENCE VECTOR

JAMES KAHN

FACULTY ADVISOR: CURTIS LOER

DEPARTMENT OF BIOLOGY

Tetrahydrobiopterin (BH4) is an essential cofactor for aromatic amino acid hydroxylase enzymes including phenylalanine hydroxylase, tyrosine hydroxylase, and tryptophan hydroxylase. BH4 serves as a vehicle for carrying electrons during the enzymatic hydroxylation of aromatic amino acids, where molecular oxygen is consumed and BH4 is peroxidated and oxidized. This particular process is crucial as the first step in the formation of monoamine neurotransmitters. We are interested in understanding the *dhs* genes (short chain dehydrogenase) from the nematode *C. elegans*, and how some may function in the synthesis of Biopterin. Using RNA interference (RNAi), we can understand gene function by generating a temporary loss of function phenotype in a *C. elegans* gene of interest. Feeding *C. elegans* with genetically engineered bacteria that express double stranded RNA from an inserted gene causes the mRNA derived from the normal host gene to be degraded and therefore temporarily blocks gene function.

SESAME STREET FOR SOCIAL CHANGE

MICHELLE KAUNANG

FACULTY ADVISOR: KRISTIN MORAN

DEPARTMENT OF COMMUNICATION STUDIES

As of 2010, Sesame Workshop has partnered with eighteen countries to co-produce international versions of Sesame Street to educate and inform children. The programs aim to improve cognitive and pro-social skills and encourage children to use their imaginations, respect people's differences, and learn cultural values and traditions. The purpose of this project is to analyze the strategies and effectiveness of the Sesame Workshop co-production in Indonesia.

The Indonesian program, Jalan Sesama, first debuted in 2007 with the objective to shape a cohesive national identity while promoting diversity by breaking gender stereotypes, broadening educational opportunities for young girls, and presenting images of different ethnicities within the region. After careful analysis, it is clear that Sesame Workshop's co-production in Indonesia has effectively produced a local version of Sesame Street, Jalan Sesama, which has uniquely designed characters and sets that represent the education needs and themes within Indonesia.

A NATIONAL MODEL FOR ENGINEERING MATHEMATICS EDUCATION

JAMES KEEGAN

FACULTY ADVISOR: RICK OLSON

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

The mathematical competency needed to excel in the engineering program at USD is very high and often a problem for students who are trying to get an engineering degree. Dr. Olson and Dr. Lord have developed a course at USD to help students succeed in the first two years of classes in the engineering curriculum. We would like to transform this course into an online format. To do this I will take the lecture slides Dr. Olson and Dr. Lord have created for the course and will adapt them, using both PowerPoint and Captive programs, into a form that is easy for the incoming student to understand. This will involve expanding each slide into every possible question and providing a corresponding answer. This project will help students learn the mathematics they will need to pursue a degree in engineering.

ACTING OUT: LESBIAN, GAY, BISEXUAL AND TRANSGENDER ACTIVIST PROMOTION STRATEGIES

MICHAEL KOWALSKI, KAYLA GOMES, JESSICA TISHUE, JOSEPH ORFINI

FACULTY ADVISOR: JONATHAN BOWMAN

DEPARTMENT OF COMMUNICATION STUDIES

The Lesbian, Gay, Bisexual and Transgender (LGBT) community is progressively gaining social acceptance, however a rift still exists due to a lack of identification from the majority and because proper communication has not been employed. Our research intends to discover what persuasion strategies employed by Empowering Spirits, Inc. were most effective for closing the cultural gap and for creating awareness among the Foundation's members so that they are better able to understand each other before they extend their mission to the rest of the community. Both gay and straight Empowering Spirits Foundation members were administered a series of surveys over a time period of three months. Survey content included questions regarding personal perceptions of the LGBT community. In addition, members were observed working in the field. Their interactions with prospective members and donors were recorded, and their language and non-verbal persuasion strategies were evaluated.

REACTION OF GLYOXAL AND AMINES TO FORM IMIDAZOLES: A COMPUTATIONAL STUDY

HADLEY KRIZNER

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DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Glyoxal is one of the two most common di-aldehydes found in clouds, dew, and fogwater, and contributes to secondary organic aerosol (SOA) formation in the troposphere. Amines and amino acids are also commonly found in the atmosphere and can react with glyoxal. Our current study aims to outline the reaction pathways of glyoxal with methylamine and glycine. Our calculations suggest that formation of a di-imine intermediate followed by the addition of another C-1 or C-2 species leads to the imidazole ring structure. Through determination of the most thermodynamically and kinetically favored pathways, we hope to further characterize the complex mechanisms contributing to SOA formation.

FACTORS AFFECTING TEENS' ATTITUDES TOWARDS THEIR PREGNANT PEERS

JENNIE KUCKERTZ

FACULTY ADVISOR: KRISTEN MCCABE

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

Research has shown that pregnant teens experience a number of negative consequences resulting from stigmatization, but little research has been done explaining why pregnant teenagers are stigmatized more than sexually active teens. The current study investigated factors that affect how teenagers view their pregnant peers. We predicted that a strong belief in the effectiveness, availability, and ease of use of contraceptives, a belief in a just world, and feelings of invulnerability would be correlated with more negative attitudes towards pregnant teens. Data analyzed from 101 high school students indicated that attitudes towards contraception and belief in a just world correlated in the expected direction with stigmatization of pregnant teens. We found no effect for feelings of invulnerability, either generally or specifically related to becoming pregnant. This research has implications for sex education programs and is important information that can aid us in better understanding and improving the outcomes of pregnant teens that face stigmatization.

SIMULATING THE SELF-ASSEMBLY OF METAL-BENZENE CLUSTERS

CHRIS LEE

FACULTY ADVISOR: JEREMY KUA

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Transition metals and benzene self-assemble in the gas phase to form two types of structures. Early transition metals form a multiple-decker sandwich structure, where metal atoms and benzene molecules stack alternately like a sandwich. Late transition metals form a “rice ball” structure, where the benzenes form a shell around a ball-like cluster of metal atoms. We used quantum mechanics to calculate the interaction energy potentials for various metal-benzene structures. Using this data, we have parameterized a reactive force field, which allows breaking and forming bonds between metals or between metal and benzene in a molecular dynamics simulation. We will present the results of our calculations for titanium-benzene and cobalt-benzene clusters.

ATTITUDES AND KNOWLEDGE OF UNDERGRADUATE STUDENTS TOWARD COMPLEMENTARY AND ALTERNATIVE MEDICINE

KRISTINA LEVESQUE

FACULTY ADVISOR: SANDRA SGOUTAS-EMCH

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

In the United States, the use of complementary and alternative medicine (CAM) has increased substantially since the 1990s. Today, approximately 40 percent of the population uses CAM, often in conjunction with conventional medicine. In contrast to public interest, research has shown that medical professionals and students harbor a resistance towards these unconventional therapies. It is important to identify the root of the stigma against CAM in order to facilitate doctor-patient communication and improve the quality of patient care. The purpose of this study is to evaluate pre-health and non pre-health undergraduates regarding their knowledge of and attitudes toward CAM. An online survey was emailed to students at three San Diego-based universities. Students were asked about their attitudes towards CAM and knowledge of specific therapies. Their perception of conventional care was also assessed. Data is currently being collected and will be presented at the time of the conference.

SUPREME COURT JUSTICES: PRESIDENTIAL PUPPETS?

JACKIE LEVIEN

FACULTY ADVISOR: DELAVAN DICKSON

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This research studies the frequency with which Supreme Court justices vote in ways that align with the ideology of the political party of the president who appoints them. Two competing theories govern this discourse, called here the “Roberts Theory” and the “Ginsburg Theory”; the Roberts theory holds that Supreme Court justices are apolitical in nature and make decisions independently of party ideology. The Ginsburg Theory, on the other hand, admits that even the Supreme Court is a political institution in which justices display political partisanship and make political decisions. My research focuses on the Rehnquist Court from 1996-2005, and shows that six of the nine justices vote overwhelmingly in ways that align with the political desires of their appointing president, confirming the Ginsburg theory. However two of the justices, Stevens and Souter, voted in ways that supported the Roberts Theory assertion that justices are nonpartisan.

RACIAL SCRIPTING

CHRISTINA LU, CLARISSA BROWN

FACULTY ADVISOR: PETER GRATTON

DEPARTMENT OF PHILOSOPHY

Kwame Anthony Appiah introduces and expands on the concept of scripting, emphasizing that there is a key difference between stereotyping and scripting; scripting goes beyond any labels that may be associated with a group. It occurs when individuals that are labeled as having certain characteristics act upon what they are stereotyped to be, in order to be associated with what the norm of their race is. Therefore, there is no choice but to internalize the script.

THE RESPONSE REGULATOR, CTRA, AFFECTS MORPHOGENESIS IN RHODOSPIRILLUM CENTENUM

ALLISON MACKRELL

FACULTY ADVISOR: TERRY BIRD

DEPARTMENT OF BIOLOGY

Rhodospirillum centenum is a purple, photosynthetic bacterium that transitions from one cell type to another while adapting to different environments. Previous research has demonstrated that several histidine kinases regulate the initiation of cyst development in *R. centenum*. We decided to investigate whether a response regulator called CtrA is involved in the regulation of cyst cell formation. Deletion of this gene resulted in a strain that grows normally in liquid culture. However, $\Delta ctrA$ colonies exhibit constitutive cyst formation while growing on an agar plate and they are deficient in swarming motility. These phenotypes can be rescued when a plasmid that

carries the *ctrA* gene is introduced into the mutant strain. Our data suggests that CtrA is involved in regulating morphogenesis in cells that are living on a solid substrate. We hypothesize that CtrA-P promotes differentiation into swarmer cells while suppressing cyst cell development.

EXPLORING THE ROLE OF DHS GENES IN *C. ELEGANS* USING PCR CLONING AND AN RNA INTERFERENCE VECTOR

JULIAN MANOS

FACULTY ADVISOR: CURTIS LOER

DEPARTMENT OF BIOLOGY

Tetrahydrobiopterin (BH4) is an important cofactor for enzymes involved in the synthesis of neurotransmitters (including serotonin and dopamine). I plan to look at a short chain dehydrogenase gene (such as *dhs-13*) present in *C. elegans* for its possible role in BH4 synthesis. An effective method for examining my gene of interest's function in *C. elegans* is with RNA interference (RNAi), which creates a temporary loss-of-function phenotype in the nematode. To accomplish this, I will first amplify the *dhs-13* gene using Polymerase chain reaction and then clone it. These sequences will then be inserted into an RNAi vector and transformed to *E. coli*, which will then be fed to nematodes. The double stranded RNA from the *dhs-13* gene produced by bacteria will then effectively destroy the normal *dhs-13* mRNA in the nematode. These temporary "mutant" nematodes can provide information on functions of the *dhs-13* gene in *C. elegans*.

CARROLL'S ALICE BOOKS AND DEVELOPING THE LITERARY CHILD — THEORY AND PRACTICE

ANALISE MARCUS

FACULTY ADVISOR: KATIE SCIURBA

DEPARTMENT OF ENGLISH

The first portion of my project traces the origins of the child protagonist in literature. Blake and Wordsworth wrote on children in the Romantic tradition; later, Victorian educational and social reforms spawned literature that prescribed behavior for 19th Century children. But Lewis Carroll was the first author to write both from the perspective of a child and for an audience of children readers. Alice is descended from nostalgic Romantics and prescriptive Victorians. Yet with her, Carroll paints a refreshingly realistic portrait of the child as preternatural, feral, and intuitive. In the second portion of my project, I attempt to write a work of children's literature. Inspired by the works I have studied, this creative piece explores the place of children in contemporary society as well as the place of new children's literature in the tradition – truly, the genealogy – of the genre.

THE RELATIONSHIP BETWEEN DIFFERENT PERSONALITY TYPES AND SUSCEPTIBILITY TO DISTRACTION

APRIL MAY, ALLISON WRAY

FACULTY ADVISOR: VERONICA GALVAN

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

Research has shown that certain personality types are more susceptible to distractions. Our research is examining how different personality types react to an overheard conversation while trying to concentrate on a task. Specifically, we are interested in whether personality type (introvert-extrovert) and one's perception of locus of control, i.e., one's views on whether an individual has control over events that happen to them, influence stress responses when exposed to different conversation types (either one-sided or two-sided). We predict that participants who are introverts and have an external locus of control will be more negatively impacted, especially when exposed to the one-sided conversation. Data has been collected from 53 participants. The participants' stress responses were determined through self-reported measure and hormone assays. If the hypotheses are supported, then individuals may need to take into account their susceptibility to distractions while completing various tasks.

MAMA'S DONATION DRIVE

MEGAN MCCREDIE, ALEX BOZICH, NIKKI MONA

FACULTY ADVISOR: JONATHAN BOWMAN

DEPARTMENT OF COMMUNICATION STUDIES

Mama's Kitchen is a non-profit organization that prepares and delivers food to men, women, and children who are affected by AIDS or cancer. Under Mama's Kitchen, there is also the Children's Nutritional Health Program that provides meals for children with sick parents. We anticipate that the University of San Diego's students will help support Mama's Kitchen organization by participating in a canned food drive. With different marketing techniques we will advertise our canned food drive so students are well aware of the drive dates in advance. With the help of this food drive we predict that students will be more aware of this organization and will participate more in non-profit organizations located in the San Diego area.

INTERNET VS. TRADITIONAL NEWS MEDIA: POLITICAL EFFICACY, KNOWLEDGE, AND PARTICIPATION

PATRICK MCDONNELL

FACULTY ADVISOR: MICHAEL PFAU

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Theoretically, in a perfect democracy, informed citizens make educated decisions about politics. Informed citizens have traditionally received their political information from the conventional media outlets of newspapers and broadcast journalism. But due to the Internet's ability to provide news on demand, both "traditional" industries are on the decline. Since 2005, American newspapers have collectively seen their revenues drop 20%, and network evening news programs have seen their audiences fall about one million per year. As the Internet is becoming a more powerful news medium, it is essential to understand how it affects citizens' political knowledge. Kenski and Stroud (2006) found only a weak link between Internet use and political efficacy, knowledge and participation in the 2000 presidential election. This paper revisits the issue using data from 2004 election to see whether this link has strengthened as Internet usage has grown.

ALCOHOL PREFERENCE IN ZEBRAFISH

GABRIELLE MCGINNIS, HEATHER BRECHT

FACULTY ADVISOR: RACHEL BLASER

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

Zebrafish are an excellent model for studying the effects of abusive drugs, which can be reinforcers in learning tasks with humans and other animals. We studied ethanol's reinforcing effects on native zebrafish. We used a conditioned place preference (CPP) test and paired contextual stimuli with ethanol exposure. In subsequent choice tests, a preference for drug-paired chambers over control chambers indicates a rewarding drug. We conducted tests in two-liter tanks with two chambers (1 and 2). First, subjects underwent an initial preference test without reinforcement. Then, they received two conditioning trials, one trial in chamber 1, the other in chamber 2. Ethanol (either 0.5% or 1.0% v/v) was present in one trial, and not the other. The subjects underwent a second preference test without ethanol. We compared initial and final preference test results to see whether ethanol significantly altered chamber preference. Results indicate ethanol's reinforcing effects are dose- and context-dependent.

THE EFFECTS OF SOCIAL NETWORKING SITES ON ATTENDANCE AND PARTICIPATION IN NFAR'S 6TH ANNUAL SAN DIEGO RACE FOR AUTISM

DANIELLE MILLER, MATTHEW LEWIS, ANN SILVA, LAUREN NICOLAS

FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES

Social networking sites (SNS) have become the new medium for information gathering, self-promotion, and advertisement. Facebook and Twitter were targeted to determine the effectiveness of SNS in increasing turnout at an event for The National Foundation for Autism Research (NFAR). NFAR is a non-profit organization dedicated to the development of treatment options and programs that improve the quality of life of children with Autism. A case study was conducted to determine the effects that SNS have on participation in the "San Diego Race for Autism," which took place on March 27th. We proposed that the use of SNS would increase attendance at this year's event. As a means of collecting data, surveys and questionnaires were distributed to participants to determine whether there is a correlation between SNS and event participation.

SYNERGISTIC TENDENCIES OF PRIVATE EQUITY FRIMS

WESLEY MINEAU

FACULTY ADVISOR: MARKO SVETINA
DEPARTMENT OF FINANCE

The research conducted is in the field of finance and addresses the concept of synergies in private equity firms. Very little is mentioned in financial textbooks about synergies and since the data needed to conduct analysis is difficult to come by, the theory is greatly understudied. The goal of the study is to prove the existence of and examine the positive benefits of synergistic tendencies of private equity firms. The analysis involves extensive data collection from multiple sources, regression analysis, and use of numerous established financial theories. Preliminary findings show that synergies do exist within private equity firm acquisitions and have some potential positive consequences. Further studies will expand upon the scope and relevance of these synergies.

FACEBOOK: A PERFORMANCE SPACE OF THE INFORMATION AGE

CAMILLE MONROE

FACULTY ADVISOR: MONICA STUFFT
DEPARTMENT OF THEATRE ARTS

In recent years, social networking sites like Facebook have increasingly been used for social interaction and personal expression. Multi-media performance artists often draw upon mediated forms of communication in their efforts to observe social interaction, interpret it, and then represent it back to audience members, but have not yet used Facebook in their work. My project

considers if Facebook might serve as a compelling new stage of the Information Age for the Facebook user and even more so for performance artists. I explore what tools are gained and lost both for interpersonal interactions and artistic expression. Drawing upon social psychology and performance studies, I suggest that Facebook, and media forms like it, allow Facebook users and performance artists to make connections and express emotions as they do offline, yet they now have the potential to reach new audiences in unexplored ways.

THE BUSINESS OF DECEIT: GREENWASHING

CAITLIN MOON

FACULTY ADVISOR: LINDA BARKACS

DEPARTMENT OF BUSINESS ADMINISTRATION

In our society today, the prevalence of “greenwashing” as a marketing technique is of grave concern. “Greenwashing” is misleading a consumer to believe a company or product is greener than it really is, or distracting the consumer from discovering the company’s environmentally unfriendly practices by putting up a front of environmental sustainability through various alliances and advertising schemes. There is insufficient regulation of this realm of business due mainly to ambiguous guidelines and lack of resources and funding by the FTC. I conducted my research by investigating companies that are guilty of such marketing practices and conclude that the most effective way to avoid falling prey to these deceptive tactics is through consumer education about what it really means to be “green.” Finally, I provide a set of guidelines businesses should look to so as to avoid being labeled a “greenwasher” and explain how to implement environmental marketing in positive, sustainable ways.

ATTITUDES AND BEHAVIORS AROUND ALCOHOL AMONG USD STUDENTS

STESHA MOORE-PAVICH

FACULTY ADVISOR: LISA NUNN

DEPARTMENT OF SOCIOLOGY

College campuses across the U.S., including USD, are concerned with undergraduate alcohol consumption. USD requires students to participate in Alcohol EDU as a way to promote healthy attitudes and behaviors around alcohol consumption. The effectiveness of Alcohol EDU and other similar programs remains an open question. I conducted survey research to study the multiple sources USD students draw on when they make decisions about consuming alcohol. Variables include: involvement in on-campus organizations, family influences, and attitudes toward Alcohol EDU. Results from this study show that 47% of students surveyed limit their number of consumed alcoholic beverages the night before an early class. 76% responded that they stay in and study the night before if they have a midterm the next day. I will present additional factors regarding the drinking behaviors of students surveyed. These findings come from an ongoing research study started in December 2009.

MESSAGES FROM TEENS ON THE BIG SCREEN: SMOKING, DRINKING, AND DRUG USE IN TEEN-CENTERED FILMS

LINDSEY MORR, ADAM VANNI, ASHLEY ADAMS

FACULTY ADVISOR: SUSANNAH STERN

DEPARTMENT OF COMMUNICATION STUDIES

Smoking, drinking, and drug use endure as popular yet dangerous behaviors among American teenagers. Films have been cited as potential influences on teens' attitudes toward and initiation of substance use. Social cognitive theory suggests that teen viewers may be especially likely to learn from teen models that they perceive as similar, desirable, and attractive. Assessments of content are necessary precursors to effects studies because they can identify patterns of representations that warrant further examination. Accordingly, a content analysis of top grossing films from 1999, 2000, and 2001 was conducted. Overall, two-fifths of teen characters drank alcohol, one-sixth smoked cigarettes, and one-seventh used illicit drugs. Therefore, recent teen-centered films may teach teen viewers that substance use is relatively common, mostly risk-free, and appropriate for anyone. As a 10-year follow-up, we will be presenting updated findings of this study through our research of films from 2007, 2008, and 2009.

HAYEKIAN SPONTANEOUS ORDER, BURKEAN TRADITIONALISM, AND LIBERTY IN THE POLITICAL SPHERE

RYAN MULVEY

FACULTY ADVISOR: MATT ZWOLINSKI

DEPARTMENT OF PHILOSOPHY

F. A. Hayek, a philosopher and economist of the Austrian school, was an articulate defender of the free market. He argued against centralization and rational constructivism in the organization of a society. Instead, he articulated a theory of spontaneous order, in which institutions emerge from the free interaction of individuals, allowing for an organically organized society. Edmund Burke, the father of modern conservatism, likewise articulated a theory of deference to tradition and institutions. This project explores the Hayekian theory of spontaneous order, while analyzing similarities with the ideas of Edmund Burke. Our hope is to contribute to answering the following important questions raised in regards to the ordering of society: What are institutions and whence have they emerged? How are they related to human action? To what point ought organic and evolved institutions be owed respect? What of human rationality? Finally, how should liberty be understood within a spontaneous order?

NMR SOLUTION STRUCTURE OF A DNA DUPLEX CONTAINING THE GUANINE ISOSTERE 4-FLUORO-6-METHYLBENZIMIDAZOLE: AN IMPERFECT NUCLEOBASE MIMIC

ALYSSA NAVAPANICH, STEFANIE SACKNOFF, SHANNEN CRAVENS, TAMMY DWYER

FACULTY ADVISOR: TAMMY DWYER, DEBORAH C. TAHMASSEBI
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Difluorotoluene (F) has been shown to be a viable nucleobase mimic of thymine. Using a similar design strategy we have synthesized the non-polar guanine isostere 4-fluoro-6-methylbenzimidazole (H), a nucleobase that is not processed by DNA polymerase nearly as well as F. To investigate the basis for this difference, we have studied three duplexes: d(CCAAHCTCC):d(GGAAGXTTGG) where X is C, F or T. ^{19}F NMR shows that the duplexes containing the HC and HF pairs exist in multiple forms while the HT containing duplex has a major form (70%) and a minor form (30%). We have used ^1H NMR spectroscopy and molecular dynamics simulations to determine the solution structure of the major form of the DNA duplex d(CGAAHCTCC):d(GGAAGTTTCG). We present here a rationale for H as an imperfect mimic of guanine.

BUILDING A VECTOR SPACE BASED INFORMATION RETRIEVAL SYSTEM USING MATLAB

NICHOLAS NOBLES

FACULTY ADVISOR: ERIC JIANG
DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

Our goal was to create an information retrieval system that could search through databases and quickly return accurate results. In this project, we made use of the vector-space model, where vectors are used to represent each document and the user's query input. The angle between the query vector and document vector can then be used to determine content relevance with a smaller angle representing a more relevant document. We developed the information retrieval system using MATLAB (a popular programming environment for scientific computing) and tested the system with MEDLINE, a benchmark information database. While the system can return documents quickly with good accuracy, there is room for some improvement. In the future we hope to further improve the accuracy of this retrieval system while extending the functionality by allowing the user to load an arbitrary database to search.

HAMMERING WITH THE QUANTUM VACUUM

SAM NOGAMI

FACULTY ADVISOR: DANIEL SHEEHAN

DEPARTMENT OF PHYSICS

In order to pursue nanotechnology it is important to understand physics at the nanoscale. At this scale length new physical interactions become important. For example, when two surfaces are held nanometers apart they are attracted to each other because of the exclusion of zero point modes between them. This is known as the Casimir effect and it is a dominant interaction at the nanoscale. This paper explores the use of the Casimir effect to heat a surface by transferring energy across the vacuum by means of elastic waves.

OVERLAP OF VIRTUAL AND FACE-TO-FACE AGGRESSION AND VICTIMIZATION

SHELDEN O'KANE, EILEEN FRANCO, MORGAN OAKLAND

FACULTY ADVISOR: JENNIFER ZWOLINSKI

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

This study examined the consistency between virtual and face-to-face forms of physical and relational (social) aggression and victimization in college students. A total of 209 freshman (70.9% female) completed self-report questionnaires of internet bullying and victimization, and face-to-face physical and relational aggression and victimization by peers. Participants were categorized as cyber-bullies (16.3%) and cyber-victims (26.8%) with little overlap (8.1%). Cyber-bullies were more likely than non-cyber-bullies to report face-to-face physical aggression, $F(1, 206)=24.70$, $p<.001$, relational aggression, $F(1, 208)=17.43$, $p<.001$, and physical victimization, $F(1, 208)=4.34$, $p=.04$. Relative to non-cyber-victims, cyber-victims reported more face-to-face relational aggression, $F(1, 208) = 8.95$, $p = .003$, and relational victimization, $F(1, 207)=21.74$, $p<.001$. Overall, these results provide evidence for the situational consistency of aggression and victimization. Cyber-bullies reported more difficulty with multiple types of face-to-face aggression whereas cyber-victims reported more face-to-face relational, but not physical, victimization. Possible methodological and theoretical explanations will be addressed.

LOOKING TO TOMORROW: MESSAGE CONSTRUCTION AND DEPICTIONS OF WOMEN

MIKE O'MALLEY, CONOR CAWLEY, MIKE GELLMAN, BRE JOHNSON

**FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES**

Communication theory dictates that messages can be manipulated to increase liking and acceptance as well as influence behaviors such as involvement and participation. College students at the University of San Diego were presented with different pictorial depictions of women in advertisements encouraging participation in a Catholic charity that provides job training for homeless women in San Diego. Students were asked to complete a survey to gauge the degree to which their perceptions of homeless women were effected either positively or negatively. They were then asked about the level of involvement at which they were willing to participate based on the effectiveness of the given messages. Based on semiotic analysis of the images used in the advertisements, a more streamlined and therefore effective marketing campaign was constructed in order to increase exposure of the charity among college students, specifically those enrolled at a Catholic university.

WHEELCHAIR BRAKE IMPROVEMENT

KYLE OCHOA, JAMES KEEGAN, MATTHEW GABBARD

**FACULTY ADVISOR: LEONARD PERRY
DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING**

People who require the use of wheelchairs face many hardships in their lives, one of which should not be the design of the wheelchair. Current brakes on hospital wheelchairs are located towards the front of the wheel, and use a simple lever to apply friction, hindering the wheel from rolling. This lever can sometimes be difficult to pull back and set for people with weak or arthritic hands, and it is positioned in a spot where injury can occur when pushing the wheel. We are redesigning the current brake to make it an ergonomic and safe design. This redesign will help keep users injury free while improving the overall brake system.

NUMERICAL SIMULATIONS OF LAMINAR AND TURBULENT PIPE FLOW

YEHA OMAR, BRYAN REED, LAUREN DORUTH, MICHAEL JAROSINSKI

FACULTY ADVISOR: FRANK JACOBITZ

DEPARTMENT OF MECHANICAL ENGINEERING

This intersession, we went to Marseille, France, for a mechanical engineering technical elective, topics in fluid mechanics. We combined theoretical fluid mechanics material with computer simulations to complement our learning. This helped gain an understanding and initiate our research project. Our projects researched the difference between laminar and turbulent flow in a long pipe using a computer simulation program. We used the Navier-Stokes equations to derive the Hagen-Poiseuille equation for laminar flow and the Darcy-Weisbach equation for turbulent flow. Results from the computer simulations were then compared to the predictions given by these equations. The project also investigated the effect of the numerical resolution, and the boundary conditions, to allow us to analyse the accuracy of the numerical solution to the theoretical calculations. It also allowed us to find a variety of results, such as the velocity profile of the flow or the pressure drop in the pipe, at different Reynolds numbers.

DIGITAL INTELLECTUAL PROPERTY: AN INVESTIGATION OF THE PAST AND FUTURE

ALEX OWEN

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DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Digital intellectual property law is an area that has experienced tremendous change since the dawn of the Information Age. While the intent behind all intellectual property policy is to encourage growth and innovation, various methods of regulation have been promulgated throughout the United States. This paper will seek to investigate the relationship between differing intellectual property models and their effect on the economy. Lawrence Lessig and Deborah Johnson's work on intellectual property will be utilized as a framework to examine the economic and political ramifications of new laws and regulations governing the use of digital property. It is hypothesized that greater economic growth will be experienced as regulations move away from Lessig's "Read-Only" model into more democratized scenarios, allowing for larger and more creative use of digital property.

THE LEGAL AND ADMINISTRATIVE IMPLICATIONS OF THE FEDERAL BAILOUT

BENJAMIN PEKAREK

FACULTY ADVISOR: CRAIG BARKACS

DEPARTMENT OF BUSINESS ADMINISTRATION

The Emergency Economic Stabilization Act of 2008, created a \$700 billion Troubled Asset Relief Program to purchase failing bank assets. This program was enacted in response to the subprime mortgage crisis reaching critical stages in September of 2008, and was seen as the one of the only viable solutions to prevent further erosion of confidence in the U.S. credit markets and the threat of an economic depression. Even though TARP funds were clearly limited to financial institutions under Section 102 of the TARP, President Bush used his executive authority to declare that TARP funds may be spent on any program he deemed necessary to avert financial crisis. Is this level of government intervention consistent with the rich tradition of capitalism and free market policies? What are legal and administrative implications of the Federal Bailout, and what impact will they have on the business sector? These questions and more are examined.

TECHNO-POWER: A FORCE TO BE RECKONED WITH

STEVE PEREZ

FACULTY ADVISOR: PETER GRATTON

DEPARTMENT OF PHILOSOPHY

Bruno Latour's "object-oriented" perspective has placed all actors, non-human and human entities, on the same ontological footing. That is, all actants are always completely deployed in their relations in the world and every actant must be treated equally. Actor-Network theory treats the social and technical as inseparable, and argues that people and artifacts must be analyzed on the same conceptual apparatus. Since some entities form stronger alliances through a combination of assemblages and increased associations, actants establish forceful footholds in the world, or black boxes, effecting our sense of reality. This paper argues (theorizes) that a new form of 'power,' or network, has emerged, impacting every aspect of the "social" world. This force to be reckoned with is coined techno-power. The technological events of the computer, Internet, automotive industry, and others have assembled and continuously remain to assemble through technological associations as one of the premiere forces in the world.

TOWARDS A NEW DEFINITION OF THE KILOGRAM

EMMETT PERL

FACULTY ADVISOR: KATHLEEN KRAMER
DEPARTMENT OF ELECTRICAL ENGINEERING

The kilogram is currently defined by the mass of the International Prototype Kilogram (IPK), making it the only SI unit derived from a physical artifact instead of fundamental properties of nature. We now believe that the mass of the IPK is drifting slowly over time. Because of this inconsistency, scientists are scrambling to find a new definition for the kilogram that will not change over time. This past summer, I worked on the electronic kilogram experiment at the National Institute of Standards and Technology, which hopes to redefine the mass standard based on Planck's constant (h), an unchanging fundamental constant. The electronic kilogram at NIST currently has the best measurement of Planck's constant in the world, making this approach the leading candidate for the redefinition. I will present the specifics of the project and discuss the contributions that I made to the Electronic Kilogram Experiment.

CZECH PRESIDENCY OF THE EUROPEAN UNION

TEREZKA PETERKA

FACULTY ADVISOR: RANDY WILLOUGHBY
DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The Czech Republic assumed presidency of the European Union for a six month period, January 1-June 30 2009. The priorities set were the 3Es: economy, energy and European Union in the World. During the presidency, they had to deal with a variety of issues that were not on the agenda, such as the Gaza crisis, the gas restrictions from Russia and the collapse of the entire Czech government. Although euroskeptic and anti-integrational, as the head of the EU, they were supposed to represent and act on behalf of the entire EU. This study will analyze the presidency and assess the successes and shortcomings. Was the Czech Presidency truly as dysfunctional as Europe claims? Was it a wasted opportunity? Were the Czechs arrogant in their attitudes towards the responsibilities of the position? "Let's Sweeten Europe" the official campaign phrase, was only the beginning of an interesting six months.

ALCOHOLISM AMONG AMERICAN INDIANS

WYNONA PETERS

FACULTY ADVISOR: MICHELLE JACOB

DEPARTMENT OF ETHNIC STUDIES

Due to the endless problems colonialism has caused, American Indian communities are striving to overcome the social and health issues affecting the Indian people. Through my research I analyze one of the major health cases of substance abuse affecting American Indians, alcohol abuse. According to the literature, 5 of 10 American Indian deaths are alcohol related. In my project, I investigate the reasons for alcohol presence and the causes and consequences of alcohol abuse among American Indian communities. I use the theory of historical trauma to conduct a critical review of postcolonial psychology and public health literatures. I discuss the ways in which alcohol has damaged American Indian communities and I argue that colonialism, historical trauma, and peer influence are major explanatory factors. In my conclusion, I point out examples of how Indian communities are addressing the substance abuse epidemic and the ways they are healing from the alcohol problem.

THE LEVELING HAND OF LIBERALIZATION?: THE EFFECTS OF LIBERAL MACROECONOMIC POLICY ON THE DISTRIBUTION OF WEALTH IN LATIN AMERICA

NICK PETERSON

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DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The economic history of Latin America in the 20th century can be split into two periods: the period of authoritarian government rule and the period of civilian rule and more democratic states thereafter. Advocates of the latter propose that liberal macroeconomic policy leads to economic growth, but more specifically, greater equitable distribution of wealth. By examining liberal Latin American states, economic progress, as controlled against global state trends, this theory's accuracy will be tested in the Latin American region.

WHY SO FAST? MORPHOLOGICAL EVOLUTION IN SEXUAL TRAITS OUTPACES ECOLOGICALLY ADAPTIVE TRAITS

TARA PIRANEO

FACULTY ADVISOR: GEOFFREY MORSE

DEPARTMENT OF BIOLOGY

Studying how rapidly characters evolve is important to understanding natural selection pressures in organisms. Seed beetles (Coleoptera: Bruchidae), for example, display both rapidly changed secondary sex characteristics (femoral spines), and stabilized ecologically adaptive characters (tibial pads). Coevolution from reproductive conflict between the sexes has caused rapidly evolved male genitalia armed with spines, which damage the female reproductive tract during copulation. As a result, both sexes have developed secondary sex characteristics: spines on their hind leg femurs. On the other hand, slowly evolving characters are a result of specialization between seed beetles and their host plant, which supports stabilizing selection. I report results of my study comparing the rates of morphological evolution in traits involved in sexual selection (femoral spines) and traits involved in ecological interactions (tibial pads) in species from the seed beetle tribe Acanthoscedini using Scanning Electron Microscopy (SEM).

“THIS IS NOT FOR YOU”: AN EXPLORATION OF THE UNCANNY IN MARK Z. DANIELEWSKI’S HOUSE OF LEAVES

CHRISTINA PRINTZ

FACULTY ADVISOR: JOSEPH MCGOWAN

DEPARTMENT OF ENGLISH

Nearly a century has passed since the publication of Freud’s essay on “The Uncanny,” yet the ideas present there have continued to find a home in contemporary works of literature. Mark Z. Danielewski’s novel, *House of Leaves*, reintroduces Freud’s concept of the uncanny within a narrative which itself explores the ambivalent relationship between *heimlich* and *unheimlich*—the familiar and the unfamiliar. Informed by narrative theory, psychoanalysis, and textual materiality, the thesis proposes that Danielewski’s novel presents a problem regarding the uncanny: By so overtly bringing attention to this idea as a literary effect, the so-called “spontaneity in literature” is killed; thus, we might conclude that Danielewski is asserting that nothing can be uncanny. Instead, attention to the spatial and textual quality of his novel provokes the uncanny in a different register. It is in the spirit of this interdisciplinary investigation of literature that the nature of this idea is pursued.

AN EXPERIMENTAL STUDY OF ION ACOUSTIC WAVES (IAW) IN ELECTRONEGATIVE PLASMA

CAMRON PROCTOR

FACULTY ADVISOR: GREG SEVERN

DEPARTMENT OF PHYSICS

Electronegative plasmas are found both in nature, in the lower ionosphere for example, and in plasma processing applications, such as vapor deposition, plasma etching, and particle beam sources. To understand the full potential of electronegative plasmas a better diagnostic of their properties needs to exist. The negative ion fraction $\alpha = n_{-}/n_e$ determines, in part, the degree of electronegativity of plasmas. Ion acoustic waves (IAWs) propagate with fast and slow modes in electronegative plasmas, and are here studied with the intent to calibrate other methods for determining α for plasmas, such as laser photodetachment techniques. The calibration effort will include a review of IAW and Langmuir probe diagnostics to better understand what a calibration effort will entail. The electronegative plasmas studied were created using Oxygen and Ar - O₂ feed gases in DC discharges confined with a multidipole arrangement of permanent magnets, producing low temperature, low pressure, ($T_e < 1\text{eV}$, $T_i \ll T_e$, $p_0 < 1\text{mTorr}$) weakly collisional plasmas.

INVESTIGATING STEREOTYPE THREAT DISPARITIES OF INTELLECTUAL UNDERPERFORMANCE AMONG AFRICAN AMERICAN, LATINO, AND CAUCASIAN COLLEGE STUDENTS

JOSHUA PRUDHOMME

FACULTY ADVISOR: KEN KEITH

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

Stereotype threat is a psychological phenomenon that inhibits the performance of individuals through an unconscious fear being associated with a negative stereotype. This study investigated the affects of stereotype threat on African American, Latino, and Caucasian college students to measure the disparities of intellectual under-performance between African American and Latinos. The participants came from the San Diego Community College District. I used a race priming demographic questionnaire and a General Record Examination verbal ability exam as a measure of intellectual ability to induce stereotype threat. I also implemented a quality of student life questionnaire to investigate a correlation between stereotype threat and quality of life. I hypothesized that differences exist between the scores of African American, Latinos, and Caucasians when affected by stereotype threat. I also hypothesized that African Americans under-perform more on standardized tests than Latinos do, and Latinos under-perform more than Caucasians when affected by stereotype threat.

SEDIMENTATION STRESS IN A UNIQUE MANGROVE CORAL COMMUNITY IN HURRICANE HOLE, ST. JOHN, USVI

RYAN QUILLEY

FACULTY ADVISOR: SARAH GRAY

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

Corals typically grow in areas of low turbidity, abundant sunlight, and low sedimentation. Enigmatically, corals growing on mangrove prop roots have recently been discovered in Hurricane Hole (HH), St. John, USVI. This study investigated the composition (terrigenous, carbonate, organic) and flux of suspended, settling and accumulated bottom sediments in three coastal mangrove environments in St. John. This comparative analysis of sedimentation in HH and 2 other bays may give an insight into the habitability of these areas for coral survival. Using Loss on Ignition (LOI), the composition of suspended, settling and bay-floor sediments was determined. HH bottom sediments contained low organic matter near mangroves ranging from 1.95-6.50%. Terrigenous matter decreased with distance from mangroves while carbonate was the inverse. Additionally, organic matter flux was considerably lower in HH. Further analysis will determine specific temporal and spatial relationships between the aforementioned sediment characteristics and their implications on coral reef survival.

H1N1 EPIDEMIC SIMULATION OF USD

JASMYN RAMIS

FACULTY ADVISOR: ERIC PAGE

DEPARTMENT OF PHYSICS

The 2009 H1N1 pandemic has resulted in a flurry of research related to the virus's composition, virulence, and migration. Here we report the results of a numerical study of an H1N1-like virus spreading through a college campus similar to USD. The parameters considered were vulnerability to illness, the number of units that an average student takes in a semester, curricular activity on campus, work hours on campus, and population density of the entire USD campus. Using data from the Centers for Disease Control and the World Health Organization, the standard SEIR (susceptible, exposed, infected, and recovered) epidemiology model was employed using the open-source spatio-temporal compartmental modeling programs FLUTE and STEM. Results of these simulations may help develop mitigation strategies for future outbreaks on campus.

IMPROVED MARKETING STRATEGY FOR THE PRINCESS PROJECT

ASHLEY RATHER, BEVERLY HUTCHINGS, ROBYN PAK, MARK TOYAMA

**FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES**

We created a marketing campaign for the San Diego chapter of The Princess Project designed to expand awareness and reach a more specific demographic. The focal point was to increase the donation of prom dresses and accessories, while encouraging monetary contributions. Through the use of a dynamic marketing strategy, we targeted the members of the university's community in anticipation of helping the non-profit reach its goal of sending over 500 girls to their high school prom. At the conclusion of the two-week marketing campaign, we explored and analyzed the relationship between the enhanced non-verbal communication of our promotional tactics and its ability to inspire the desired action from the target audience.

GENDER DIFFERENCES IN PERCEPTION OF RESEARCH ETHICS

ERICH RIESEN, NEESHA DAULAT

**FACULTY ADVISOR: ANNETTE TAYLOR
DEPARTMENT OF PSYCHOLOGICAL SCIENCES**

The purpose of this study was to examine gender differences in ethical principles. Participants read a sample case study which possibly violated ethical principles and commented on whether or not the study did so. Based on each participant's assessment of the study, we ranked the responses on a scale separated into three levels. After categorizing the responses unbiased of gender, we then matched the responses to the gender of the participants. We ran a CHI square test on the data and then found that there was a significant difference in men and women regarding the ethical principles in the case study. This study shows that differences in gender do play a role in what a person perceives to be ethical or unethical.

USING DATA MINING TECHNIQUES TO CREATE A QUALITY DATA SET FOR INTELLIGENT SYSTEMS

MICHAEL RIOS

FACULTY ADVISOR: JEFF WRIGHT

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

This research involves development of a component of an intelligent system to do speech recognition. An “intelligent system” is a system that is able to recognize and understand its surroundings and react to them logically. In this project the Perl language was used to download a large HTML file containing the contents of the online Webster’s Unabridged Dictionary of the English language. The general expression capability of Perl was used to sort through the large resulting file, keeping just those within a predefined target list. The second part of the project consisted of using Matlab for sound processing. The sound file of a sample word in the dictionary was downloaded from an online dictionary in order to split the sound file into the correct amount of syllables. The breakdown of sound and text provides a base for creating a strong network that can aid in the development for more accurate intelligent systems.

PERFORMANCE & DEVELOPING COMPETENCE; THREE SPHERES ASSOCIATED TO RETENTION AND GRADUATION OF RACIALLY UNDERREPRESENTED STUDENTS AT USD

JELISA ROBERTS

FACULTY ADVISOR: ROBERT BARRY FLEMING

DEPARTMENT OF THEATRE ARTS

Retaining students is fundamental to the ability of an institution to carry out its mission. Retention is also a reflection of students’ overall interest in what is being offered by their institution, including but not limited to academic, financial, and social support. How might racially underrepresented students become academically and socially better connected with the University of San Diego, thus improving the retention of these students? Using Arthur Chickering’s “Seven Vectors of Development,” specifically “Developing Competence,” this project analyzes how racially underrepresented students achieve academic success, corporeal awareness, and interpersonal skills through activities with performative qualities, such as role playing. The result of this analysis aims to potentially ensure retention and graduation. Through the critical examination of an archival text followed by ethnographic interviews, my project investigates the multicultural competencies necessary to understand a diverse population of students at the University of San Diego.

THE ADVANCED ENCRYPTION STANDARD

KIMBERLY ROE

FACULTY ADVISOR: STACY LANGTON

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

The Rijndael Algorithm has been the Advanced Encryption Standard for American Cryptography since 2000. Since this algorithm is used in nearly all secure internet transactions, the encryption methods used must contain processes that are sufficient to protect against all known effective methods of cryptanalysis. The designers of Rijndael relied on mathematical concepts like modular arithmetic, probability, and finite field theory to develop a sufficiently secure, cost effective, and efficient system compatible with modern cryptographic needs and capabilities. We will present an explanation of what those attempting to crack contemporary cryptosystems look for, as well as an analysis of what the designers of Rijndael have done to counteract these attacks and help their system remain effective for many years to come.

WHAT DOES TECHNOLOGY HAVE TO SAY ABOUT TIME?

DANIEL ROSIAK

FACULTY ADVISOR: PETER GRATTON

DEPARTMENT OF PHILOSOPHY

The question “what is time?” is thought to be a highly abstract question, reserved for those with plenty of time, arm-chair space, and tobacco. Martin Heidegger, a 20th century German philosopher, began his career by standing this extraordinary question on its head and asking instead the (strangely) more ordinary one: “Are we ourselves time? Am I myself time?” Working off of the writings of Heidegger, my thesis argues for the importance of seeing the question of time as no other than the question of technology, and of broadening our understanding of how technology, not just technologies, operate. By asking how we engage with and are engaged by the things that make up our modern world, I argue, we are finally able to ask that old dusty question of time again, this time with concrete results, namely an increased awareness of our status as conditioned beings and thereby the singularity of events.

SHOE TYING MECHANISM TO MINIMIZE BACK PAIN

KRISTEN SCHALLIOL, TOMMY MELLIN, CASEY WEISS

FACULTY ADVISOR: LEONARD PERRY

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Back pain is a common ailment for elderly individuals and can cause pain during everyday movements and tasks. A common everyday task that is subject to this pain is bending down to put on and tie your shoes. Though a seemingly simple task, individuals with back pain may find it harder to do. With an estimated 80% of the population experiencing back pain at some point

during their lifetime, there is a need for assistance to solve this problem. By designing a device to aid the elderly in successfully putting on and tying their shoes, our intention is to make an everyday task easier for these individuals with back pain. From research and collaboration with senior citizens at Bayside Community Center we will create a very customer focused piece of technology for this purpose. Our goal is to improve an existing product and keep cost and necessary materials at a minimum.

CASA ADVERTISING

MEREDITH SCHNEIDER, AMELIA MATTIS, CAMERON PARSONS, ERIN SCHNEIDER

FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES

The organization CASA (Court Appointed Special Advocates) was targeted in the experiment. Because of the outstanding number of children who go through the legal system yearly who are not fairly represented, we intended to target a younger audience with new advertising methods so as to increase the number of children benefitted yearly, as well as allow more time for a CASA to volunteer, since they are trained once for any extended amount of time. The method targeted was the website, however the target audience is university students who, after being certified, are able to dedicate a longer amount of time to the court system in general, benefitting a larger percentage of children in the long-run. Specific attention to detail was made regarding patterns in advertising to college-aged individuals.

IMPROVING THE EFFICACY OF FUNDRAISING MESSAGES: STRATEGIES FOR DIRECT MAIL INVITATIONS TO CHARITY EVENTS

DEANNA SCHULTZ, MACKENZIE MILLER

FACULTY ADVISOR: JONATHAN BOWMAN
DEPARTMENT OF COMMUNICATION STUDIES

In recent years, considerable growth has occurred in the area of fundraising research. Many studies have tested communication effectiveness in regards to charitable donations, but little attention has been given to understanding what makes people more likely to attend charity events. Working with Girl Scouts, San Diego-Imperial Council, this study assesses the effectiveness of communication messages in relation to fundraiser attendance for the non-profit organization's largest event, Urban Campout. We will specifically address visual strategies, metaphoric frames and persuasive appeals in direct mail invitations.

HAVE THE ARMORED SCALE INSECTS LEUCASPIS AND THEIR BACTERIAL ENDOSYMBIONTS CODIVERSIFIED?

CHARDONNAY SHINN

FACULTY ADVISOR: GEOFFREY MORSE

DEPARTMENT OF BIOLOGY

Bacteriocyte associated endosymbionts have been estimated to occur in approximately 10% of insects. Whether they help breakdown food or provide essential amino acids and vitamins, various hosts and their bacteria have developed an extremely mutualistic and often even a compensatory relationship. As a result of this intimate association between host and endosymbiont, we often see long lineages of parallel diversification between the two. However, most of these studies have focused on deep relationships and it is unknown how differences in host and endosymbiont population biology may affect patterns of cospeciation at interspecific and intraspecific levels. In this study, we used bacterial primers, 16s and 23s, to reconstruct a phylogeny of the bacteria housed within New Zealand armored scale insects belonging to the genus *Leucaspis* and compare this to a phylogeny of the hosts. We report the findings on the long-term parallel diversification of this insect radiation with its endosymbiotic bacteria.

ADVERTISING IN SCHOOLS: THE SEARCH FOR FUNDS IN THE SAN DIEGO UNIFIED SCHOOL DISTRICT

SAMANTHA SHUSS

FACULTY ADVISOR: SUSANNAH STERN

DEPARTMENT OF COMMUNICATION STUDIES

Due to budget cuts totaling nearly \$300 million in the past three years, the San Diego Unified School District has been forced to look for new sources of revenue. One prime consideration is a controversial plan to allow advertising into San Diego's middle and high schools. As the school board drafts a new policy concerning advertising, this thesis examines the benefits and concerns associated with school commercialism, as well as focuses on the principals' reactions to the potential change through the use of surveys and personal interviews. Schools are seen as a safe learning environment, and there is apprehension that this policy may work to provide advertisers with a captive student audience. Should schools allow commercialism inside their walls to help with the budget deficit? If so, what types of advertisements should be permitted? These questions and more are examined in this in-depth analysis of advertising in San Diego schools.

THE DISTRIBUTION OF WOLBACHIA IN SEED BEETLES

JESSICA SULLY

FACULTY ADVISOR: GEOFFREY MORSE

DEPARTMENT OF BIOLOGY

Wolbachia is a parasitic bacterium that infects a wide number of insect species. It is found in the reproductive tissues of its host, primarily transmitted through eggs. It is also transmitted horizontally across species. *Wolbachia* manipulates its host's reproductive cycle to maximize the parasite's spread throughout the population by feminizing males or inducing cytoplasmic incompatibility. One likely outcome of this is that the hosts will evolve counteradaptations to maintain a 50:50 ratio of males to females. My project focuses on the distribution of *Wolbachia* in seed beetles (subfamily Bruchinae). Using PCR and gel electrophoresis techniques, I am testing DNA extracted from several seed beetle species to see if *Wolbachia* DNA is present. I can correlate the *Wolbachia* data to a phylogeny of seed beetles and do further experiments to see if there are any common defense mechanisms between the seed beetles against *Wolbachia*.

GENETIC ANALYSIS OF TETRAHYDROBIOPTERIN SYNTHESIS IN *C. ELEGANS* USING RNA INTERFERENCE

ANTONYA TAKAHASHI

FACULTY ADVISOR: CURTIS LOER

DEPARTMENT OF BIOLOGY

Tetrahydrobiopterin (BH₄) is an important molecule required for the synthesis of serotonin and dopamine, neurotransmitters that ensure proper functioning of the central nervous system in animals. Genes of particular interest include those encoding enzymes that may act like sepiapterin reductase, which catalyzes one BH₄ synthesis reaction, such as various short chain dehydrogenase enzymes. RNA interference (RNAi) will be used as a method to "switch off" genes that may be involved in BH₄ synthesis in the nematode *Caenorhabditis elegans*. RNAi involves making a double-stranded RNA (dsRNA) of a particular gene, which causes destruction of the normal mRNA in *C. elegans*. This will create a temporary mutant from which we can test gene function as a result of shutting down expression of that gene. By using the RNAi method, we hope to come closer to understanding which genes are responsible for BH₄ synthesis in *C. elegans*.

MUNICIPAL GOVERNMENTS; DOES IT TAKE A STRONG MAYOR TO GET THE JOB DONE?

GRANT TAYLOR

FACULTY ADVISOR: MICHAEL PFAU

DEPARTMENT OF POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Municipalities have modified their systems of local government as demographics have changed, generally adopting frameworks that grant more power to the mayor. This phenomenon has resulted in an increase in strong mayor forms of municipal governments. Through the examination of empirical data, municipal governments in California will be analyzed to compare the effectiveness of strong mayor and council systems as measured by fiscal stability and public official turnover rates. Further, special consideration will be given to the local characteristics that either enable or hinder effectiveness.

A WORLD SYSTEM ANALYSIS OF BLACK LABOR

CARA THOMPSON

FACULTY ADVISOR: ERIK FRITZVOLD

DEPARTMENT OF SOCIOLOGY

The use of cheap labor has been sought out the world over and it has never been more evident that during the African Slave Trade. From the manner in which slaves were brought over to the laws passed following emancipation black labor has been exploited across the Americas. By examining the labor market through a World System's perspective we can discover why this dynamic exists. What, if any systems have been put in place globally to maintain this dynamic? These questions and more are examined by looking at the use of black labor from the African Slave Trade through emancipation and beyond through a World System Analysis perspective.

PORNOGRAPHY AND VIEWS ON WOMEN AND ACCEPTANCE OF RAPE MYTHS

MAUREEN TRUXTON

FACULTY ADVISOR: LISA NUNN

DEPARTMENT OF SOCIOLOGY

My project studies the relationship between pornography and views of women. I am surveying adults of both sexes. I am asking various questions about the type of pornography watched, how often one views pornography, how one views women alone, how one views women in comparison to men, and one's acceptance of rape myths. This study offers an up to date analysis of these issues, following the well-established line of research and literature, including works by Catherine MacKinnon and Lori Watson. My research cannot claim causal relationship, as does previous research by Mike Allen, however I do find a correlation between pornography and degrading

views on women, especially by men. Results indicate that the violence of the pornography or the frequency of the consumption of pornography has a strong positive relationship with subservient views of women. For future research I want to mix my quantitative results with more qualitative theory and interviews.

AERSOL FORMATION BY OLIGOMERIZATION

JACOB TURLEY, DAVID O. DE HAAN, STEPHANIE E. WOOD, VANESSA BLASIC

FACULTY ADVISOR: DAVID DEHAAN

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Polymerized materials in aerosol contribute to losses in visibility, and negative human health and climate effects. α -dicarbonyl compounds, glyoxal and methylglyoxal react with themselves and amino acids in the atmosphere. These reactions increase the excess uptake of the compounds onto aerosol particles, thus increasing the aerosol volume. This volume augmentation due to oligomer formation prevents the evaporation of the compounds in aerosols. AMS and SMPS analyses used to quantify and identify the components of the oligomer formation broaden the understanding of aerosol behavior and provide important information about the chemistry of clouds, fog, and aerosol.

THREADING A NEEDLE WITH PIN POINT EASE

CHASE TUSHAUS, BRIAN PARTIDA, PATRICK CASTAGNA

FACULTY ADVISOR: LEONARD PERRY

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Many products made today are designed for customers with normal physical and mental abilities. The project we are proposing will allow those with specific disabilities the opportunity to perform simple, daily tasks. A common challenge faced by many senior citizens is the use of hand eye coordination and the ability to see clearly as 14 million Americans suffer from impaired vision and 40 million more suffer from arthritis. These numbers show that many American seniors may be hindered in completing ordinary tasks. We focused on challenges associated with sewing, primarily the act of threading a needle. Our product will allow one to thread a needle with ease and expedite the sewing process creating a more enjoyable experience.

SOCIAL CAPITAL: LATINO ADOLESCENTS, EXPECTATIONS, AND ASPIRATIONS FOR THE FUTURE

BARINIA URIBE

FACULTY ADVISOR: JUDITH LIU

DEPARTMENT OF SOCIOLOGY

What role do adult expectations play in student aspirations in educational institutions? In other words, do adults at school have an impact on student academic achievement? Does race and ethnicity have an impact in student academic achievement? Using the data from a survey of 156 Latino students at an urban high school in the northeastern U.S, this paper hypothesizes that high school students who have stronger positive ties with adults at school are likely to have higher academic aspirations. Data from this survey support the idea that adult expectations have an influence in student success, measured in both higher grades and educational aspirations.

THE RELATIONSHIP OF EXTREME WAVE HEIGHTS IN THE NORTH PACIFIC TO LARGE SCALE ATMOSPHERIC AND OCEANOGRAPHIC CONDITIONS, AND TO ARCTIC REGION TEMPERATURES

SHANE VALIERE

FACULTY ADVISER: ZHI-YONG YIN

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

The formation of mid-latitudinal cyclones is influenced by local and large scale atmospheric and oceanographic conditions. These storms (within 30o-50o N. latitude) create large areas of high winds that can create very large waves in the winter (Nov-Mar). Analysis of the largest waves (95th percentile) reveals when and where the largest storms have formed. Historical significant wave height data (late 1970's to present) obtained from the National Data Buoy Center (NOAA) are analyzed at 13 station locations in the NE Pacific from the Gulf of Alaska to Southern California. The largest wave heights are correlated to numerous climate indices that describe particular atmospheric and oceanographic conditions. The correlation results are used in building a general prediction model by finding the conditions most conducive to large storm formation. Furthermore, large wave events are correlated to historical monthly average temperatures from weather stations in-between 50o and 60o N. latitude, from Siberia to Alaska. These correlation results are used in an effort to expand this prediction model, as temperatures in the Arctic region may be related to large storm formation.

FACILITATED JAR LID OPENER

VICKY VARGAS, ALISA SIEBER, ANDREW AECIDIACONO

FACULTY ADVISOR: MING HUANG

DEPARTMENT OF MECHANICAL ENGINEERING

After reviewing the spectrum of products commonly used by senior citizen, we decided to improve the design for a jar opener. Currently, there is a variety of jar lid openers on the market; however, none are specifically targeted to senior citizen needs, such as reducing ample force to assure that the users do not strain their hands. Our objective is to redesign the method for applying the force necessary to remove the jar's lid through a ratchet design. This design will incorporate a lever arm to reduce the amount of force applied by the user. To accommodate for different jar lids a wedge design will be utilized. We hope that this design will meet the seniors' needs to facilitate the jar lid opening process, making it as strain free as possible.

SPECIAL DELIVERY

JOSHUA VERGARA, MANUEL BARRAZA, DESIREE HOWELL, JESSECA CRISSEY

FACULTY ADVISOR: JONATHAN BOWMAN

DEPARTMENT OF COMMUNICATION STUDIES

This research project will identify the best approaches to raising awareness, donations and/or volunteer hours for Special Delivery, a non-profit organization in San Diego. Special Delivery is a locally based, 100% volunteer organization that provides quality home-cooked meals to medically homebound individuals suffering from critical illnesses. Our group will examine various methods of outreach within the San Diego and USD community. The ultimate goal in this study is to provide Special Delivery with an effective framework for recruitment, awareness and donation that can be used in the future. Methods such as interpersonal communication and social networking will be utilized and analyzed for its efficiency. As such, we will attempt to illustrate the relationship between communication research and application for social justice.

CHARACTERIZING A NOVEL CHLORIDE CHANNEL INHIBITOR

JENNIFER WOOLEY, SABRINA PHILLIPS

FACULTY ADVISOR: KIMBERLY MATULEF

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Chloride channel (CLC) antiporters are membrane proteins that couple the movement of chloride ions and protons in opposite directions across cellular membranes. While it is known that the lack of functional CLC transport proteins can cause diseases of the bone and brain, their exact physiological roles are not well understood. We work with ClC-ec1, the only bacterial homolog that has been studied functionally and structurally. We are studying the mechanism and effects of a novel small molecular inhibitor of ClC-ec1, 4,4'-octanamidostilbene-2,2'-disulfonate (OADS). We have determined that OADS inhibits proton flux through ClC-ec1 by performing proton flux assays. To better characterize the mechanism of inhibition by OADS, we are currently performing lipid bilayer recordings. This research will provide insight into the conformational changes that occur in ClC-ec1 as well as shed light on possible therapeutic effects of such inhibitors.

THE EFFECTS OF DISTRACTION ON STRESS RESPONSES

ALLISON WRAY, ANKITA DHAR, RACHEL CARTER, KELLY CORREA, CYNTHIA GUTIERREZ, DESIRE BEAUMONT, MAT GOLLEY

FACULTY ADVISOR: VERONICA GALVAN

DEPARTMENT OF PSYCHOLOGICAL SCIENCES

When in public, there are few places that restrict the option of having a conversation with another person. As a result, people are often exposed to others' conversations. Our research is interested in how either a one-sided or two-sided conversation affects a person's stress response while performing a cognitive task. We were able to expose over 50 participants to a conversation while doing an SAT task and to gather self-reported information on perceived stress and believability, and also physiological stress as indicated by hormone assay. Though analysis still needs to be conducted, we expect to find that one-sided conversations are perceived to be more stressful than two-sided conversations by all groups.

CROSSING THE BOUNDARIES OF IDENTITY: ASIAN AMERICAN THEATRE AS A SPACE FOR SOCIAL RENEGOTIATION

TAYLOR WYCOFF

FACULTY ADVISOR: MONICA STUFFT

DEPARTMENT OF THEATRE ARTS

In this project, I examine the response of three Asian-American playwrights, Amy Hill, Rob Shin, and Diana Son, to dominant representations and stereotyping of Asian-Americans through their plays *Tokyo Bound*, *The Art of Waiting*, and *Satellites*, respectively. By applying the theories of critical race studies scholars David Palumbo-Liu and Lisa Lowe to these works, I show how Asian American theatre pieces should be considered in line with literature and film as important discursive and performance spaces for the positive renegotiation of identity. Similarly to literary narratives that take up the issue of Asian-Americanness as shown by Palumbo-Liu and Lowe, playwrights such as Hill, Shin and Son acknowledge the delineation of certain boundaries and also propose potential opportunities for the crossing of those boundaries. I argue that many Asian American plays both support and call for an understanding of Asian American identity as changeable and dynamic.

WOMEN & SPORTS MEDIA: SHAPING ATTITUDES OF FEMALE ATHLETES

KRISTEN YOON

FACULTY ADVISOR: JONATHAN BOWMAN

DEPARTMENT OF COMMUNICATION STUDIES

The advances women have made in the sports world have served as a significant indicator of how perceptions of gender roles and values are socially constructed. Female athletes' participation dramatically increased with the initiation of Title IX in 1972, which in turn, also increased the media exposure of these women, celebrating their achievements and athletic ability. Representations of females in sports media, though seemingly positive and optimistic for the status of women, remain unequal in sports coverage and production quality. Images of women tend to be highly sexualized, focusing on physical differences that attribute dominance to males and an inferior status to women. This study is designed to look into sports media's masculine hegemony in its presentation and reinforcement of gender roles by asking female athletes at USD their attitudes of sports media. Their responses will attempt to prove whether or not females challenge dominant ideologies in sports media.

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