COLLEGE OF STATEN ISLAND/CUNY

APRIL 21, 2005

CSI UNDERGRADUATE RESEARCH CONFERENCE*

Conference Schedule

12:15 - 1:15 Authors and mentors lunch
1:00 Opening remarks by President Springer
1:30 - 4:00 Research Poster presentations

*Sponsored by the Office of the Provost with funding from the CSI Student Government Academic and Curricular Affairs Commission, and the CSI Foundation.
It is indeed a pleasure that the College of Staten Island is hosting its fourth annual Undergraduate Research Conference. Its continuing theme “Your Passport to Knowledge” underscores the importance of the pursuit of knowledge, academic excellence, and scholarly research. I strongly believe that learning takes place both inside and outside of the classroom. The projects undertaken by our student scholars with the guidance of their faculty mentors and presented at this conference are testimony to in-depth learning and shared accomplishments starting in the classroom and continuing outside. As always, I take great pride in these accomplishments and congratulate all of the student scholars and their faculty mentors. I commend them for their hard work, dedication, and collaboration in designing, undertaking, and completing these projects.

I am equally proud that the Conference has grown in the diversity of the academic disciplines represented and the number of undergraduate students mentored by faculty members. This year the 51 presentations featuring the collective research accomplishments of over 60 undergraduates from 13 academic departments represent considerable growth over the previous years, and includes research in the natural sciences, mathematics, social sciences, and the humanities. It is also important to note that the College supported 49 of our students’ research projects through CSI Undergraduate Research Awards sponsored by the CSI Foundation, my office, and faculty grants. I am pleased that our students and faculty made excellent use of the Undergraduate Research Awards to further their intellectual pursuits in the disciplines of their choice. I am also pleased to offer my congratulations to the 2004 CSI Undergraduate Research Award winners and their mentors who were judged to have excellent research presentations. The names of these award recipients are included in this conference publication.

We all know that a college-wide conference of this magnitude requires a great deal of planning and many organizational hands. I want to express my sincere appreciation to the faculty and students on the conference committee who invited conference abstracts and organized the event. Equally deserving are our student-faculty research teams who contributed to making this fourth annual conference a success. I would be remiss in not gratefully acknowledging the continued financial support for the conference provided by the CSI Student Government Academic & Curricular Affairs Commission and the CSI Foundation.

Conducting research, in my view, is an enterprise with no disciplinary boundaries although unique approaches and methods
best serve each of the disciplines. Scientists, for example, conceive and conduct experiments in their laboratories; social scientists engage in fieldwork and analyses of problems; artists, through years of rigorous preparation, perform, compose, and expand the creative possibilities of human expression. I am always fascinated, encouraged, and inspired by the engagement of our students with their faculty mentors in the collaborative pursuit of knowledge, particularly as I know it will serve to strengthen their critical thinking skills, increase the understanding of their disciplines, and provide greater appreciation for inquiry.

I hope to see more of you participate in 2006 “Passports to Knowledge” as we continue on our lifelong journey dedicated to learning. Let me once again congratulate and thank all student presenters and their faculty mentors and wish them success in their future projects.
2004 CSI UNDERGRADUATE RESEARCH AWARD WINNERS

An Analysis of Transportation Equality in New York City
Amanda Katz
Mentor: Jonathan Peters
Department of Business

Biosynthesis of a Multidomain Peptide of the Saccharomyces Cerevisiae α-Factor Receptor
Jacqueline Englander
Mentor: Fred Naider
Department of Chemistry

The Influence of Static Magnetic Fields on Glutamate Uptake
Nida Maqsood
Mentor: Andrzej Wieraszko
Department of Biology

On the Failure and Facilitation of Conditional Discrimination: A Replication and Extension of Williams (19982)
Louis Rotondo and Melody Berkovits
Mentor: Bertram Ploog
Department of Psychology

FACULTY JUDGES FOR 2004 UNDERGRADUATE RESEARCH AWARDS

Fairfid (Lorie) Caudle, Department of Psychology
Abdeslem El Idrissi, Department of Biology
Xien (Jason) Fan, Department of Computer Science
Ralf Peetz, Department of Chemistry
Cynthia Scarinci, Department of Business
Chwen-Yang Shew, Department of Chemistry
Elizabeth Wheeler, Department of Nursing
Maurya Wickstrom, Department of Performing and Creative Arts
Sarah Zelikovitz, Department of Computer Science

Research Poster Presentations
Center for the Arts 1P-Atrium
1:30pm - 4:00pm

1. Daniel Kaplin
   Mentor: Sarah Berger
   Department of Psychology
   Development of Inhibition in Infancy

2. Elpida Potouridis
   Mentor: Patricia Brooks
   Department of Psychology
   Naming Pictures

3. Enrico Arcaro
   Mentor: William R. Bauer
   Department of Performing and Creative Arts
   Emily Dickinson Poems Set to Music By Aaron Copland: A Linguistic Analysis

4. Steven Cipriano
   Mentor: William R. Bauer
   Department of Performing and Creative Arts
   Louis Armstrong: Individuality through Timbre

5. Alex Efros
   Mentor: William R. Bauer
   Department of Performing and Creative Arts
   Rhythm and Movement Learning Assessment: A Pilot Study

6. Yong Lu and Fadeke Ogunbiyi
   Mentor: Qiao Sheng Hu
   Department of Chemistry
   Synthesis of Novel Ligand-containing Polymer for Transition Metal Catalysis

7. Stephen Spinella and Zhen-Yu Tang
   Mentor: Qiao-Sheng Hu
   Department of Chemistry
   Synthesis of Aryl/Alkenyl Tosylates for Suzuki Cross-Coupling Reactions

8. Heidi Durkin
   Mentor: Lisa Jean Moore
   Department of Sociology, Anthropology, and Social Work
   The Intersections of Multiple Biosocial Worlds Producing Knowledge About Sperm
9. Marietta Giuliani  
   Faculty Mentor: Cynthia Scarinci  
   Department of Business  
   A Survey of Small Business Administration Disaster Loan Recipients

10. Prashant Sharma and Rajesh Sardar  
    Mentor: Bhanu Chauhan  
    Department of Chemistry  
    A stable Route for the Synthesis of Amine Functionalized Metal Nanoparticles

11. Mehta Mukti and Shawn Fernando  
    Mentor: Probal Banerjee  
    Department of Chemistry  
    Influence of the Serotonin 1A Receptor on Brain Development

12. Buddima Ranasinghe and Tomasz Sobocki  
    Mentor: Probal Banerjee  
    Department of Chemistry  
    Engineered Expression of 5HT1A or 5HT2A Receptor in Order to Create a Model Mouse Hippocampal Neuron

13. Toni Eversley  
    Mentor: Ruth Stark  
    Department of Chemistry  
    Purification and Activity of a Peroxidase Associated with Wound Healing in Potato

14. Smitha Abraham  
    Mentor: Elena McCoy  
    Department of Biology  
    Metal Transport and Anti-oxidant Defense in Candida albicans

15. Jonathan Blaize and Maureen Downey  
    Mentors: Elena McCoy and William L’Amoreaux  
    Department of Biology  
    Increased Phosphate Levels Alter the Effects of Non-Genotoxic Xenobiotics in Candida albicans

16. Maureen Downey and Jonathan Blaize  
    Mentors: Elena McCoy and William L’Amoreaux  
    Department of Biology  
    Dibutylphthalate and Tween 80 Induce Morphological Changes in the Yeast Candida albicans

17. Svetlana Rabinovich, Boris Arshava, Patricia Cano-Sanchez, Racha Estephan  
    Mentor: Fred Naider  
    Department of Chemistry  
    Synthesis and Circular Dichroism Analysis of the Sixth Transmembrane Peptide of a G-Protein Coupled Receptor

18. Nathalie Torres and Louis Rotondo  
    Mentor: Bertram O. Ploog  
    Department of Psychology  
    Responding of Five Carneau Pigeons and Six Seabright Bantam Chickens

19. Alex Trofimovsky, Tara Gibson, and Louis Rotondo  
    Mentor: Bertram O. Ploog  
    Department of Psychology  
    Timing Behavior in Pigeons

20. Heather Farrell and Kristina Caiazzo  
    Mentor: Bertram O. Ploog  
    Department of Psychology  
    Overselectivity Among Children with Autism

21. Jonathan Daniel Campo  
    Mentor: Ying Zhu  
    Department of Media Culture  
    China’s Media Systems

22. Jacqueline Englander, Racha Estephan, Tatsuya Inui, Boris Arshava  
    Mentors: Jeffrey M. Becker, and Fred Naider  
    Department of Chemistry  
    Department of Microbiology, University of Tennessee, Knoxville  
    A Multidomain Fragment Containing the Third Extracellular Loop

23. Massimo LoBuglio  
    Mentor: Stephane Tonnelat  
    Department of Sociology, Anthropology, and Social Work  
    Energy Action, a Coalition of Environmental Organizations in an Alliance to Support and Strengthen an Emerging Student and Youth Clean Energy Movement in North America.

24. Marina Kogan  
    Mentor: Sarah Zelikovitz  
    Department of Computer Science  
    Exploring Queries for Background Knowledge for Text Classification
25. Kristin H. Kane and Brian P. Bergen
Mentors: Andrew Poje*, Bala Sundaram*, and Richard R. Veit**
*Department of Mathematics and **Department of Biology
Modeling Competing Strategies in Foraging Seabirds

26. Javier Alvarez
Mentors: Bala Sundaram*, Andrew C. Poje*, and Richard R. Veit**
*Department of Mathematics, and **Department of Biology
Critical Assessment of an Acoustical Degradation Model for Cetacean Strandings

27. Edlira Kumbarce
Mentor: Deborah Sturm
Department of Computer Science
Similarity Matching for a Medical Event Recording System

28. Michelle Philippin
Mentor: Katherine Goodland
Department of English, Speech, and World Literature
Shakespeare on Stage and in Film from 1970-2000

29. Chad N. Antoine
Mentor: Natacha Gueorguieva
Department of Computer Science
Modeling of Odor Information Processing in the Human Brain

30. Natalie Sanghvi
Mentor: Natacha Gueorguieva
Department of Computer Science
Activity of Spiking Neurons Stimulated by External Signals of Different Wave

31. Andrew Varriale
Mentor: Natacha Gueorguieva
Department of Computer Science
Solving Problems with Multilayer Perceptron and Radial Basis Functions Neural Networks

32. Anthony Vignola
Mentor: Natacha Gueorguieva
Department of Computer Science
Design of Radial Basis Functions as Adaptive Filters and Function Approximators

33. Ankoosh Jain
Mentor: Natacha Gueorguieva
Department of Computer Science
ICA Based Neural Networks for Blind Sources Separation

34. Michelle Bosco and Anna Guirguis
Mentor: Kathleen M. Cumiskey
Department of Psychology
The Impact of Cell Phone Usage on “Quality Time”: Interruption or Insignificant?

35. Luisa Otalora
Mentor: Robert Corin
Department of Biology
Differentiation of RBL-2H3 Cells in vitro

36. Norie Taniguchi
Mentor: Matthew Solomon
Department of Media Culture
On the Impulse of Moment: The Encounter of the Western and Japanese Tradition

37. Kristen Lindtvedt¹, Steven Takach¹, J. Douglas ², Daniel Rice³, and William Fields³. ¹College of Staten Island ²Hunter College ³Language Research Center, Georgia State University
Mentor: Sonia Ragir
Department of Sociology, Anthropology, and Social Work
Fair-play in Juvenile Bonobo Chimpanzee (Pan paniscus): Observations of Sexual Differences

38. Debra Iovino
Mentor: Sonia Ragir
Department of Sociology, Anthropology, and Social Work
The Effect of Low Level Trauma to the Central Nervous System on Child Development

39. Joseph Takle
Mentor: Andrew C. Poje
Department of Mathematics
Equations in a Parallel Computing Environment of a Domain
Decomposition Algorithm for Solving Two-dimensional Partial Differential

40. Dalia Elhindi
Mentor: Susan Holak
Department of Business
The Power of Color: An Extended Study of Color Associations
41. Azmat Latif  
   Mentor: Charles Liu  
   Department of Engineering Science and Physics  
   Identifying Quasar Host Galaxies in the COSMOS Field

42. Joseph Maniscalco  
   Mentor: Alan Zimmerman  
   Department of Business  
   Barriers to Internationalization: A Comparative Study of Irish and U.S. Software Firms

43. Eric Magaram  
   Mentor: Carlo Lancellotti  
   Department of Mathematics  
   The Synchronization of Non-linear Oscillators

44. Ali Abidi and Alexandra Romito  
   Mentor: Louis Klarevas  
   Department of Political Science, Economics, and Philosophy  
   War Fatalities and Public Opinion: Exploring America’s Growing Aversion to Casualties

45. Olga Naglyuk and Michelle Nedd  
   Mentor: Ralf M. Peetz  
   Department of Chemistry  
   Controlled Polymerization of Norbornene and Norbomadiene

46. Nancy Maria Williams  
   Mentor: Louis Foleno  
   Department of Sociology, Anthropology, and Social Work  
   Would Blacks Achieve Success if They Were Guided to Aspire for Less?

47. AnnMarie Costella  
   Mentor: Louis Foleno  
   Department of Sociology, Anthropology, and Social Work  
   David “Son Of Sam” Berkowitz: Inside the Mind of the .44 Caliber Killer

48. Kleitias Petri and Sabrina Mosca  
   Mentor: Louis Foleno  
   Department of Sociology, Anthropology, and Social Work  
   America, the Land of Dreams

49. Carole Skalski and Louisa DiGerolamo  
   Mentor: Eileen Gigliotti  
   Department of Nursing  
   An Integrative Review of Stressors in the Neuman Systems Model Research Literature

50. Corinne Cavuoti  
   Mentor: Patricia Brooks  
   Department of Psychology  
   Children’s Spoken Language Comprehension in Real Time

51. Magda Beksinska, Boris Arshava, and Racha Estephan  
   Mentor: Fred Naider  
   Department of Chemistry  
   Biosynthesis of the Sixth Transmembrane Domain of a G-Protein Coupled Receptor
This project investigates the development of infants’ ability to inhibit a compelling response. The experiment was designed to integrate traditionally disparate domains of development -- cognition and locomotion -- to study how the performance of complex motor skills interferes with infants’ performance of higher-level cognitive processes. 13-month-old crawling and walking infants were encouraged to follow one of two possible routes to reach their caregivers. In one condition, infants travel direct paths on flat ground. In the other condition, infants travel indirect paths to reach their caregiver at the other end. In both conditions, infants make their way to the goal at one location for several trials in a row. Then, the goal is switched to a new location and the babies’ task is to reach the goal at the new location taking a new path. Videotaped sessions will be coded for behaviors indicative of infants’ ease or difficulty in switching from an old, familiar path to a new one to reach the goal directly.

Poster # 1
Development of Inhibition in Infancy
Daniel Kaplin
Mentor: Sarah Berger
Department of Psychology

Poster # 2
Naming Pictures
Elpida Potouridis
Mentor: Patricia Brooks
Department of Psychology

This experiment examines the similarities and differences in paired words and collections of words that would be used in a subsequent study entitled Naming Pictures. English speaking students from the College of Staten Island were shown 80-100 pairs of words in four controlled conditions. In the first condition, paired words were semantically associated with one another (COW ---- MILK). In the second condition, we paired words that were categorically associated with one another (COW ---- CHICKEN). In the third condition, we paired words that were not semantically associated (CHICKEN ---- MILK); and in the fourth condition, paired words were not categorically associated (CHICKEN ---- BAR). Each pair of words appeared in a separate computer slide, and the participants had to rate whether the words were semantically related on the Likert Scale (from 1-extremely similar to 6-extremely different). From the 80-100 pairs of words, 30-45 pairs of words were chosen for the Naming Pictures study.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
In time periods, life experience, and influences, Emily Dickenson (1830-1886) and Aaron Copland (1900-1990) were vastly different. But critics have noted both artists’ wit, delicate use of metrical variation and irregularities in rhythm, as well as the direct way they dealt with messages, emotions, and imagery in their work. So it is natural that, in the song settings of Dickinson poems that Copland composed, one intuitively hears a connection between the poetry and music of these two artists. Some of this connection comes from the fact that, like music, poetry relies on meter and rhythm, in addition to words, to convey meaning and emotion. In embarking on the journey this research took us on, we set out to learn what other factors contribute to this connection.

Selecting five of the twelve poems Copland set, we looked closely at the poetry before turning to the music. Because English words are naturally stressed when read aloud, in each line of verse we noticed where the stresses occur. Counting the syllables in each line, we determined the poetic feet and the meter. Breaking down each poem into “phrase units,” we studied the poet’s use of enjambement at line breaks. As we did this step, the speech patterns in each phrase unit began to take on a visual shape. Next, we broke the poem down into “Sense Units,” underlining each group of words that fit best together to form a sense unit. Finally, we made a “phonemic transcription” of each poem using the Trager-Smith phonemes to represent each sound. Speech sounds are influenced by where in the body each sound comes from. To produce understandable diction, a singer must control not only the vibration of vocal chords, but also the shape of the mouth needed to produce each sound properly. The phonemes gave us a lot of information about the vocal production needed to make these songs understandable to a listener.

Turning to the five selected songs, we looked at the scores and listened carefully to the recordings. Played back at a slower tempo, these recordings exposed important linguistic aspects of the singing. As we studied the songs, we graphically represented various relationships between the words and the music. The charts that resulted show each word’s stressed syllable, where each word falls in relation to the beat, its phonetic spelling, including whether or not its consonants are voiced, how long each syllable is, how it is connected to the next word, and whether the melodic line goes up or down. In conveying melodic pitch direction and phrasing of each song, the charts show that the poems’ phonetic elements lend themselves to the pitches and stresses that Copland chose. Charting these poems’ linguistic elements has given us a better understanding of Copland’s use of prosody in setting these poems to music—an understanding we are already using in our own songwriting.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
The name Louis Armstrong is recognized everywhere. Since Armstrong’s day, thousands of musicians have graced the American stages, bandstands, and radio waves. Yet few of them may be regarded as a cultural phenomenon. Armstrong was one of these rare few. What qualities lifted this man to the legendary status he attained in the world?

The object of our research was to determine some of the factors that led Armstrong’s work to be so widely respected. To do so, we wrote down in musical notation several performances that Armstrong recorded in the 1920’s and 1930’s, when he first made his mark. The procedure of transcription exposed Armstrong’s musical choices to close study. From applying this procedure, we have learned that rarely does he sing a note that strays from the harmony. For us, the most interesting part about such a skill is that, while making his decisions instantaneously, he also executes them accurately.

Developing the skill of transcribing has helped us anticipate what musical event is about to take place, so we can prepare our decisions, rather than rely just on instinct. By analyzing some of Armstrong’s vocal performances, we’ve come to realize, that timbre—the qualities of a sound that distinguish it from other sounds with the same pitch, rhythm, and volume—may be as important as the pitches themselves. Armstrong used a multitude of vocal techniques including growling (fluttertongue) and smearing (glissando). By using these techniques, vocally and on the trumpet, he formed his own unmistakable sound and set himself apart from others.

\[1\] Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants

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Undergraduate Research

The chance for students to conduct research may well be the best measure available of the quality of an institution’s undergraduate education.

The method of teaching referred to as Dalcroze Eurythmics works by synchronizing the physiological and psychological aspects of learning. It assumes that a student who comprehends a rhythmic idea can express this same idea in real time, through movement. Students who can walk in time to a beat and perform the beat with other physical motions, for example, are expressing their understanding.

This research study generated data that allowed investigators to evaluate two related assumptions: 1) students’ physical movements assist them in learning fundamental rhythmic skills and ideas; 2) by revealing the degree to which students are grasping the material, these movements can help the instructor assess learning. Secondary sources for this study included research from areas such as proprioception, kinesthesia, neuromuscular facilitation, and the functioning of the sensorimotor system.

Using volunteers as a basis for the research, the investigators organized a sample Dalcroze class in which participants had to adjust their time, space and energy in order to correctly synchronize their movements with live improvised music. Their errors and self-corrections were then analyzed to establish at what stage in the process the correct time, space and energy combination had been reached, and how long the adjustments took for each student. The results were then plotted as an iconic mapping of time as a visual-spatial analogy.

Our findings indicate that, by the end of the session, the participants were successful--each to varying degrees--in identifying the beat and in synchronizing their motion to the music. Subsequent interviews with the volunteers confirmed our findings.

'Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Transition metal catalysis has become very important in chemical synthesis as numerous chemical reactions are constantly catalyzed by transition metal catalysts. Room temperature Pd(0)-catalyzed Suzuki coupling of aryl chlorides with arylboronic acids have only been recently realized; and this represents a remarkable advance in transition metal catalysis. The study of the use of bulky, electron-rich monophosphines as ligands for transition metal-catalysis has also attracted much attention in recent years. They have been demonstrated as unique, highly efficient ligands for a number of transition metal-catalyzed reactions. A high yield method has thus been designed in the synthesis of a ferrocenylmethylphosphine from readily available materials. This phosphine containing polymer has proven to be an effective ligand for room temperature cross-coupling reactions such as the Suzuki coupling of aryl chlorides with arylboronic acids. The research project is conducted in stages involving the alkylation of hydroquinione, bromination of dialkoxyl benzene, synthesis of diboronic acid, and the polymerization of ferrocenylmethyl alcohol. The main objective of this research is to provide highly active palladium catalysts that will be widely applied by chemists in pharmaceutical and organometallic research.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants

The Suzuki cross-coupling reaction has become one of the most efficient methods in the formation of carbon-carbon and carbon-heterocyclic bonds. The synthetic pathways reported in the literature using Ni (0)-based catalysts have been reported as using aryl/alkenyl halides as the coupling partner. Aryl/alkenyl tosylates are attractive equivalent to aryl/alkenyl halides because of their easier preparations from phenols/enols and their increased stability with regard to aryl/alkenyl triflates. In this presentation, we report the prepartion of a number of aryl/alkenyl tosylates and their cross-couplings with arylboronic acids.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Although semen is understood in biological terms as a mixture of prostaglandin, fructose, fatty acids, and 1% sperm cells, there are numerous other ways we come to understand this substance. This qualitative research project demonstrates that our social, cultural and scientific understandings of semen are deeply inter-related with our perceptions of masculinity. This paper explores the intersections of multiple biosocial worlds producing knowledge about sperm. Semen, left at the scene of a sex crime, has become tantamount to the gold standard of incriminating evidence to be processed and distilled by bio-forensic technicians. The biomedical world of DNA technologies, the criminal justice world of forensics, and the popular world of entertainment collaborate to create particular meanings about leaky semen and dangerous men. Beginning with the hugely popular television franchise of sex crime entertainment, we interrogate both the popularization of DNA forensics techniques as well as the bio-medical application of these tools in the criminal justice system. In analyzing the biomedical, scientific, historical, legal and popular documentation of DNA forensics as data, we illustrate the interplay between these texts and our social practices in the creation of discourses of masculinity.

Poster # 8

The Intersections of Multiple Biosocial Worlds Producing Knowledge About Sperm

Heidi Durkin

Mentor: Lisa Jean Moore
Department of Sociology, Anthropology, and Social Work

Benefits of Undergraduate Research

The actual benefits of engaging undergraduates in research may differ from experience to experience, but clearly include such things as:

- Challenging students to pose and answer meaningful questions;
- Increasing the number of high quality interactions between students and faculty outside of the traditional classroom;
- Enlivening the intellectual climate on campus and stimulating discussions and collaborations within and across disciplines; and
- Helping students develop quantitative, problem-solving, and presentation skills.

Jill Singer, Council on Undergraduate Research Quarterly, March 2004

Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
We are in the process of conducting research on disaster recovery and contingency plans for small businesses in the United States. Contingency planning and disaster recovery are the processes that companies develop to help them prepare for and bounce back from disasters. Large corporations have disaster recovery teams and outside organizations to help with this process. Small businesses do not have that luxury. The purpose of this survey was to determine if small businesses that experienced a disaster actually had a recovery plan in place prior to the disaster, and if not, if they had developed a plan since the disaster.

We achieved a response rate of 13%, or 106 returned surveys out of the 800 sent out. The results of the survey were very interesting. We found that the majority of the respondents did not have a disaster recovery plan before experiencing disaster. The most common reason cited for this was that they did not have the time or money to do so. The majority of those that did have plans in place did not update them because, once again, they did not have the time or money to do so. It was interesting because, for many, the experience of a disaster did not change their planning methods. This was because these small businesses still faced the same challenges after the disaster that they faced before, limited resources. They felt that they still did not have enough manpower and money to run their businesses and plan for disaster. Some of the respondents even indicated that they had experienced more than one disaster.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
In recent years, the rigorous investigation of nanometer-sized particles has been prompted by their size-dependent properties and the possibility of arranging them in nano assemblies. Crystalline nanoparticles are favored because of their high degree of atomic order, as well as their chemical behavior, which may be controllable and highly organized. Potential applications are numerous in this field, because of the extremely large surface areas of the nanoparticles. A new method will be introduced in which nano sized silver particles are stabilized with amine compounds. The reduction of the silver salts in this category are done in the presence of linear polyhydrosiloxanes leading to the quantitative formation of silver nanoparticles at room temperature.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants

Undergraduate Research at CSI

The College of Staten Island encourages and supports undergraduate/graduate students to work with faculty mentors on research or other creative projects. Students who engage in undergraduate/graduate research learn through inquiry and experience with an intensity and depth not likely encountered in the classroom.
Emtryonic brain development is associated with an initial burst of cell division. At a particular stage in embryonic brain development, the preneuronal cells receive signals for them to either undergo proliferation or migration to their respective destinations. This is followed by a phase, where few of these cells receive molecular signals for them to mature and make neuronal synapses while the rest undergo apoptosis. Previous studies in our lab have shown that a signaling pathway called MAPK initiated by the binding of the agonist 8-OH-DPAT to receptor (5-HT1A) causes inhibition of programmed cell death, also known as apoptosis. The 5-HT1A receptor plays a crucial role in regulating mood and behavior. This receptor exerts trophic action during brain development. In its absence in the hippocampus and front brain, there would be heightened anxiety. Furthermore, the expression of the 5-HT1A receptor and/or its signaling activity are altered in multiple disorders that affect the brain, such as alcoholism, cocaine abuse, Alzheimer's disease, and Schizophrenia.

Therefore, the previous observations strongly indicate that r-HT-1A receptor mediated molecular signaling plays an important role in forming crucial neuronal connections in a developing brain. Using wild type and 5-HT-1A-R knockout mice, we will use immunohistochemistry on hippocampal derived brain csices for signal transduction studies. Cell division will be monitored by immunostaining for BrdU. We will also monitor the activation of MAPK and PKC-, inhibition of the proapoptotic enzyme caspase-3, and induction of synaptic markers MAP-2 and synaptophysin will be analyzed in hippocampal slices by the use of Western blotting and Immunostaining. Brain slices from 5-HT-1A receptor knockout mice will be used as a control to identify nonspecific affects. Therefore, our main objective would be to analyze the effects of the 5-HT-1A receptor in brain development.

\[1\] Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Previous studies have indicated that stimulation of neuronal receptors, such as the serotonin1A receptor (5-HT1A-R), could cause attenuation of the activity of N-type Ca2+ channels, thus resulting in protection of neurons against apoptosis. Similarly the stimulation of the serotonin2A receptor (5H-HT2A-R) causes a release of Ca2+ from the endoplasmic reticulum triggering apoptosis. Based on the above findings, our objective is to create a neuron derived cell line HN2-A12 (expressing mixed Ca+2 channels) where constitutive expression of either 5HT1A or 5HT2A would allow us to build a model system resembling a hippocampal neuron. To achieve this we will use 5HT1A or 5HT2A cDNA from previous experiments, in order to prepare receptor cDNA constructs. By stable transfection into HN2-A12 cells two cell lines will be created each expressing 5HT1A or 5HT2A receptor. We further believe that these cell lines can be used in determining the pathway of the downstream events that follow receptor and channel activation.

Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Higher plants possess different structures that function to ensure their survival. Such structural components include suberin, an insoluble, lipophilic, incompletely understood biopolymer that serves as a protective layer in roots and may be induced to form in response to wounding and other environmental stresses. This cell-wall modification involves the biosynthesis of an aromatic (phenolic) domain (SPPD) and an aliphatic domain (SPAD). The SPPD remains undefined, however, it has been suggested that the polymerization of the aromatic components of suberin (hydroxycinnamic acids, hydroxycinnamic alcohols, and amines) involves an anionic peroxidase.

Peroxidases are enzymes known to catalyze the formation of covalent linkages among phenolic polymers. In our previous experiments, this significant reaction using the horseradish peroxidase (HRP) enzyme was monitored and the products identified by NMR and MS methods. To verify if the same crosslinking reactions are occurring in the potato, the current research involves extraction of the peroxidase from wound-healing tissues of the potato. The peroxidase activity of the enzyme is being monitored spectrophotometrically, and the dehydrogenative polymerization of the aromatic components using the extracted enzyme is underway. Polymerization results from the HRP and the native potato peroxidase are being compared in order to achieve a better understanding of the suberization protective mechanism in potatoes and other plant tissues.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Candida albicans is a commensal in the gastrointestinal tract and vaginal mucosa and an opportunistic pathogen in the debilitated host. The ability to be maintained as a commensal implies that mechanisms that promote long term survival are in place in this organism. During the infection process, the fungicidal activity of phagocytic cells, the first line of host defense against invading organisms, involves the metabolic generation of reactive oxygen species. The fact that C. albicans is more resistant to induced oxidative stresses than the non-pathogenic, closely related yeast Saccharomyces cerevisiae has been the basis for several studies in the laboratory related to oxidant protection. The metalloenzyme, superoxide dismutase is the principle enzyme involved in the elimination of reactive oxygen species (ROS). Recently, a cytosolic, manganese-dependent superoxide dismutase (SOD3), has been described in C. albicans. Our interest in this enzyme has been stimulated by the finding that growth in manganese-supplemented minimal medium affords adaptive protection to a sensitive strain of C. albicans challenged with peroxides and the superoxide generating chemical, menadione. In S. cerevisiae, the metal transporters, Smf1 and Smf2, which affect manganese uptake are co-regulated at the post-translational level by manganese ions. It should be noted that accumulation of intracellular manganese itself has been implicated in the protection against superoxide through a non-enzymatic mechanism. Three C. albicans strains are currently maintained in the laboratory. Only one strain, ATCC. 36232, exhibits increased sensitivity to ROS. Intracellular manganese levels have not been determined in this strain however strains CC504 and 10231 which are less sensitive to menadione have comparable intracellular manganese levels. This study is part of a project to examine the effects of manganese transport and manganese-dependent enzymatic activity on growth and survival of C. albicans.
In an accompanying study, we show that *Candida albicans* can be used to assay the effects of non–genotoxic xenobiotics. In yeast, phosphate acts as a nutrient signal and may affect membrane potential of mitochondria. To determine the role(s) of increased phosphate levels on cellular changes associated with treatment of yeast cells with dibutylphthalate, Tween 80, or the combination, we supplemented minimal media with 100 mM phosphate. Addition of high phosphate resulted in increased vacuole content, as well as polyvacuolar bodies. DBP had no effect on cell wall shedding in minimal medium containing 100 mM phosphate, but an increase in vacuole content was observed. Addition of Tween 80 in the presence of high phosphate reserved the increase in cell wall thickness normally observed and decreased vacuole number. Combining the two chemical agents resulted in an increase number of vacuoles as was observed with either phosphate or DBP addition. We conclude that addition of phosphate alters the response of yeast cells to xenobiotics.

*Candida* species can be used to assay the effects of environmental contaminants on induction of peroxisome proliferation. In our assays, we used dibutylphthalate, (a known inducer of peroxisome proliferation in rats), Tween 80 (an oleate that can induce esterase or peroxidase activity) or a combination of the two to determine their effects on peroxisome number and other potential morphological changes in *C. albicans*. Cultures treated with dibutylphthalate alone increased the presence of vacuoles and peroxisomes. This treatment also had the effect of the outer cell wall being peeled into the medium. In the Tween 80 treated cells, there was both an increase in cell wall thickness and peroxisomes. Cultures treated with both dibutylphthalate and Tween 80 had an increase in the size and number of vacuoles plus increased peroxisomes, but did not show cell wall peeling. Our results demonstrate that these chemicals can induce peroxisome proliferation and that *C. albicans* can be effectively used to test environmental contaminants.
Two peptides corresponding to the sixth transmembrane domain of the Saccharomyces cerevisiae α-factor receptor (Ste2p) were synthesized in order to determine whether these peptides have enough solubility for NMR studies. A thirty-six residue peptide (M6-36; S-243 to K-269; KKKKKSFHILLIMSCQLVPSIIFILAYSLKKKKK), with four lysines at the carboxy terminal and five lysine residues at the amino terminal and a thirty-nine residue peptide (M6-39; Q-240 to K-269; KKKKKQFDSFHILLIMSCQLVPSIIFILAYSLKKKKK) containing three additional Ste2p residues were synthesized. The lysine residues were added to improve the solubility characteristics of the two peptides. The M6-36 and the M6-39 peptides were synthesized using the Applied Biosystems Inc. 433A Peptide Synthesizer with standard FastMoc chemistry. Following the synthesis, the two peptides were cleaved from the resin using trifluoroacetic acid (9.5 mL) and 1,2 ethanedithiol (0.25 mL) and water (0.25 mL) as scavengers and purified using HPLC. Circular Dichroism analysis of the M6 peptides (200μM approximate concentration) was performed in TFE/water, and in the presence of DPC, DHPC, and SDS detergent micelles. CD data showed that both of these peptides exhibit significant helicity in the four environments tested in the presence of high lipid to peptide ratios. These results provide definitive evidence that high-resolution studies can be carried out on these molecules.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants

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**The Research University**

The research university must facilitate inquiry in such contexts as the library, the laboratory, the computer, and the studio, with the expectation that, professors, will be students’ companions and guides.

*The Boyer Commission on Educating Undergraduates. REINVENTING UNDERGRADUATE EDUCATION: A Blueprint for America’s Research Universities, 1998*
An analysis of conditioned (autoshaped) responding of five Carneau pigeons and six Seabright bantam chickens was the focus of this study. In autoshaping, presentations of a key light (conditioned stimulus, CS) are followed by response-independent delivery of food or water (unconditioned stimulus, US). Past studies have examined various aspects of the topography of the autoshaped response, but no direct comparison of drinking behavior between pigeons and chickens has been conducted. Pigeons use their beaks as a suction mechanism with little head movement while drinking, whereas chickens must raise their head for gravity to aid in drinking. If these differences in drinking (unconditioned response, UR) were apparent in conditioned responding (pecking at a key light signaling water, CR), then this would constitute evidence that the topography of the UR has a direct effect on the topography of the CR. This would be in contrast to other studies that have shown an effect of the US on the CR. Head movements during CS presentations were videotaped for later analysis. Preliminary results indicate that during key pecking, the chickens did not exhibit more head movements than the pigeons. Furthermore, there is some evidence that pigeons pecked at the CS more frequently than the chickens. This means that contrary to predictions, there is no direct link between this aspect of UR and CR topography.

In the present experiment, timing behavior in pigeons (i.e., perception of time with differential outcomes) was observed. Eight pigeons served under four fixed-interval (FI) schedules (two FI 16-s and two FI 48-s, one of each pair ending in a small, the other in a large reward). The four key lights associated with these schedules were presented successively on the left and right keys. An inter-trial interval of ten seconds separated the presentations of the four FI schedules. If timing occurred, pecks would be proportionally distributed over the entire interval regardless of the value of the FI schedule. For example, if 7% of all responses under the FI 16-s schedule occurred in the first 10% of this schedule (i.e., within 1.6 s), then also 7% of all responses under the FI 48-s schedule should occur in the first 10% of that schedule (i.e., within 4.8 s). However, the different reward magnitudes were expected to affect timing as would become apparent in deviations from the proportional distribution. Our results indicate that the pigeons indeed exhibited timing behavior, yet the effect of reward magnitude remained unclear. Future studies will address this issue further and investigate if it is possible to speed up, delay, reset, or stop an internal clock if it exists in pigeons.

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Stimulus overselectivity is a phenomenon that occurs commonly within the autistic spectrum. Studies have shown that while nonverbal autistic children respond more to the content of word-like stimuli, that echolalic autistic children respond more to the intonation in such stimuli. The purpose of this pilot study was to assess responses to content versus intonation in word-like and real-word stimuli. Participants of the experiment consisted of four autistic boys of different functioning levels. One was excluded because he did not learn to play the game. The remaining three children were trained with a video game, in which two stimuli were presented on each trial. Stimuli were spoken words presented as a statement or as a question. Each child was trained with three different sets of stimuli. Responses to the S+ were intermittently reinforced, responses to the S- were not. During testing the children were presented with the four possible combinations of content and intonation. Results indicate that performance was poor during training sessions, which made interpretation of the test results generally impossible. However, for those sessions in which S+ responding was consistently high, there was an indication that the children responded slightly more to intonation than content on test probes during the test sessions.

In doing research for Prof. Ying Zhu’s book on China’s media systems, we have learned a great deal about a Chinese media system in transition. We learned that China adopted a US based institutional model, but found sources questioning the viability of whether the US television broadcasting model is a good match for China. Throughout this research, it has become clear that as China’s television broadcasting system becomes more decentralized and privatized, as marketing becomes more vital for its successes, the future of China’s media industry is still in the balance.

The research process provided an invaluable knowledge of library research procedures. The majority of the research consisted of poring over academic abstracts of relevance, from numerous databases and other second hand sources, and securing the full text hardcopies when required. Our presentation will include copies of relevant materials illustrative of the Chinese media system in transition and the process of library research.

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A multidomain fragment containing the third extracellular loop, seventh transmembrane domain, and cytosolic tail (E3-M7-T40) of the α-factor pheromone receptor (Ste2p) found in the yeast *Saccharomyces cerevisiae* has been biosynthesized as a fusion protein. The 73-residue peptide was released from the fusion protein by CNBr and studied via NMR. The NMR spectrum of the $^{15}$N uniformly labeled peptide was complex, making peak assignment difficult. To help simplify the spectra, a fusion protein selectively labeled with $[^{15}\text{N}]$ leucine was expressed in rich media supplemented with high concentrations of $[^{15}\text{N}]$ leucine to repress the leucine biosynthetic pathway. Approximately 100mg of pure fusion protein was obtained per liter of growth. MS analysis of the fusion protein (MW = 21,523 Da) indicated $^{15}$N leucine as well as some background labeling. The HSQC spectrum confirmed the MS results with the appearance of nine major peaks identified to be leucine and some minor peaks. A plasmid corresponding to a double domain fusion protein containing the third intracellular loop, sixth transmembrane domain, third extracellular loop, seventh transmembrane domain, and cytosolic tail (I3-M6-E3-M7-T40; receptor residues Arg231 through Ser339) of Ste2p has also been biosynthesized. Expression and isolation of this double domain fusion protein has proven to be very difficult and the correct molecular mass has not been verified. To circumvent this problem a novel indirect approach to the double domain peptide combining both biosynthesis and chemical synthesis is being taken. Using native chemical ligation a synthesized thiol-ester sixth transmembrane domain will be fused to a biosynthesized seventh transmembrane domain with a cysteine residue at its N-terminus. Recent results on this project will be summarized.

'Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
This paper is an analysis of a group pushing for social change called Energy Action (EA), a coalition of environmental organizations in an alliance to support and strengthen an emerging student and youth clean energy movement in North America. This paper starts by looking at the organizational evolution of EA as reflecting an overarching vision for a social justice movement. Then, we examine the group’s operational methods. By looking at how the group defines and addresses the problems of local communities as symptoms of broader systemic injustices, this paper examines strategies that Energy Action uses to achieve their goal to engage students and youth in direct action to communicate an alternative vision to the community. By drawing on past, small, but forceful, initiatives, we will look at how the commitments of several campuses to reductions in greenhouse gas emissions helped shape the movement. Then, we will go from looking at past projects to current campaigns that thrust forward the EA agenda of producing greater social and political investment in energy efficiency. Additionally, we will place focus on the degree in which EA is challenging society’s taken for granted ideological frameworks while introducing new conceptual categories for making sense of the lived experience.

**Showcasing Undergraduate Research**

There is a great deal of excellent, top-quality “designer’s showroom” research, scholarship, and creative activity that is done by undergraduate students each year in this country. Some of it is on display the annual National Conference on Undergraduate Research, where each year an impressive array of scholarship from a wide variety of academic disciplines is presented.

In the days of modern technology when information recourses are obtained from the Web, and much of the Web is stored as text, the problem of text classification becomes extremely important. The text classification problem can be defined as the labeling of a set of textual data as belonging to certain distinct categories.

Incorporating background knowledge into a text classification task allows for the combination of readily available unlabeled data with a labeled training data set to help in classifying new test examples. Our research explores methods that create secondary corpora of unlabeled but related documents using the World Wide Web.

Obtaining the most representative or important words from the training and test data and using those to create the background knowledge is a way to create a better secondary corpus. The problematic question is how to define an “important word” within the data set. In solving this problem we borrowed a concept of information gain from Information Theory. A Java application was developed to determine the important words of the data set. The application creates background sets of data based upon the \( n \) most important words for each class of the data set in two different ways. \( n \) is passed as a command line parameter, which allows us more control over the range of important words. In our runs we used values for \( n \) ranging from 3 to 10.

Our results show that error rates can be reduced when background sets of these forms are used.
It has been speculated that Black-browed Albatrosses, Thalassarche melanophris, use two strategies for finding patches of krill, area-restricted search and local enhancement. In area restricted search, individuals increase their rate of turning when prey are detected whereas, with local enhancement, individuals use the behavior of others as a cue to the presence of prey. In other words, area-restricted searches result from direct observation of krill while local enhancement results from observing aggregations of feeding birds. In general, albatrosses may well use a combination of both these strategies. We investigate the efficacy of each strategy in varying environmental conditions using two agent-based models. The models are implemented using Matlab and MIT’s Starlogo. In the models, each bird obeys rules of behavior, interacting with other birds as well as with the environment. First, we tested the models by varying parameters for which a dependence is obvious. When the efficacy of the model is established, more volatile parameters can be varied, namely: the distance from which birds can “see” feeding flocks and the characteristic turning behavior associated with area-restricted search strategies are modified for different spatial krill swarm distributions along with different krill swarm dynamics. The amount of time the birds spend feeding, as opposed to foraging, is the metric used for comparing each scenario. Both models suggest that the efficacy of these two strategies may depend upon bird and swarm densities, different spatial distributions of krill swarms and their disappearance rates.

We evaluate the assumptions and conditions inherent to a recently reported model explaining geographical clustering in cetacean (Odontocetae) strandings. An issue of continued interest to marine scientists and the general populace, this phenomenon has as yet no definitive explanation consistent with all available data. In the new model, acoustical degradation of echolocation signals is directly effected by coastline topography, and the occurrence of acoustical “dead zones” in relative proximity to shore is suggested as a significant factor in the localization of potential stranding sites. Using ray acoustics in an open billiard setting, this mathematical model makes a number of simplifying assumptions with respect to the biology of stranding events. We critically examine all of those relevant to the physiology and behavioral dynamics of cetacean echolocation in order to make an accurate determination of the conditions for the applicability and efficacy of the model. In turn, we weigh the strength of this model versus that of other popular stranding theories.

*This research was supported in part by the UBM (Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences) program of the National Science Foundation.
The Harvard Medical Practice Study from 1991 reported on the incidence of adverse events and negligence in hospitals in the United States. The authors defined an adverse event as an injury initiated by medical management. The team reported that in one year in New York State there were estimates of nearly 7,000 deaths and over 800 cases of permanent and total disability resulting from negligent care.

The authors of this study recommended improving reporting and analyzing of data to identify risk factors such as age or clinical specialty.

The Medical Event-Reporting System for Transfusion Medicine, a widely used reporting system has been shown to improve the reporting and analysis of blood related medical errors.

**Project**

- Built a system that given a data bank of reported errors detects similar errors.
- Provided an interface connecting existing components of a medical error reporting system
- Developed an algorithm that compares and scores error events

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**Poster #27**

**Similarity Matching for a Medical Event Recording System**

Edlira Kumbarce

Mentor:
Deborah Sturm
Department of Computer Science

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**The Fascination**

To become absorbed in a subject - fascinated by it—opens the door of creativity. In very large measure, the commitment that people make to the arts, to the humanities, to science, to virtually all bedrock elements of civilization, arises because they become fascinated beyond any level justified by unity or self-interest. Fascination generally drives people in positive directions and deserves to be encouraged.

Larry R. Faulkner, President, University of Texas at Austin (in Academic Excellence by Research Corporation)
This research is intended to serve as a foundation for a book project by Professor Katharine Goodland with Palgrave publishing. In conjunction with a British scholar, John O’Connor, this book upon completion will be a chronicle of Shakespeare’s works that have been on film or performed on stage by major theater companies throughout Great Britain, United States and Canada from 1970-2000. The records will include the dates of the performances, the venue, the name of the theater company or film production company, the director, various designers and technicians, often a cast list and various reviews from critics.

Our presentation will include display samples of the research, photographs, quotes and “fun facts” to create a crystal-clear portrait of the importance of this research. Many of our most popular and cherished celebrity actors grew their wings in live productions of Shakespeare; many people are not aware of this. There is no existing guidebook or account of Shakespeare in performance that parallels the magnitude of this project. Considering that Shakespeare is probably the most prolific and important playwright ever, and this being an original record of who, when, where and how, in the past 30 years have brought his works to life, we believe that it will be a truly wonderful experience to offer a “world premiere” preview of the book project.

The presentation will be a combination of evidence of the research done, combined with a creative flair to be sure to capture the dramatic nature of Shakespeare and the project itself.

\[1^\text{ Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants}\]
The question of how brain-like networks behave dynamically and in particular, how they might store and retrieve information has become a focus of many mathematicians and physical scientists interested in building devices with pattern recognition abilities. Olfactory system deals with the analysis and processing of odor molecule’s information. It is one of the oldest systems present in mammals. The olfactory bulb helps in discriminating and identifying different odors. Since the olfactory bulb is located close to the brain, studying the functionality of it would help us understand how other parts of the brain work.

In the brain, fast oscillations of local field potentials, which are thought to arise from the coherent and rhythmic activity of large numbers of neurons, were observed first in the olfactory system and have since been described in many neocortical areas. Oscillations and chaos has been the subject of extensive studies in many chemical, physical, and biological systems. Oscillations can occur in neural system due to properties of single neurons and properties connectivity among neurons. The studies on oscillations in neural networks further investigate special geometries of neural network architecture that promote oscillation. The model, which we consider, is based on oscillatory type of neural nets given the biophysiological evidence, which places a strong emphasis on this particular type of dynamics in the cortical circuits. It will be important to determine the sequence of events in the olfactory bulb circuitry during odor stimulation in order to understand the generation of odor-induced responses of mitral/tufted cells and signals from the output neurons of the olfactory bulb.

We model and simulate the problem of how the olfactory neural system processes the odorant molecular information for constructing the olfactory image of each object. The brain simulator is based on oscillatory neural networks and uses coupled oscillators because the cell structures act like coupled oscillators. In order to implement this in the model, we use nonlinear differential equations with matrices to represent a system of mitral and granule cells.

Our approach to this problem is to faithfully model the olfactory neural system and simulate its outputs. The input to the model is assumed to be composed of true odor signal and a sum of the receptor background and the central inputs to the mitral cell dendrites in the input layer.

\[ \text{Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants} \]
Spiking neuron systems gained increasing interest in recent years because they represent spatio-temporal relations within simulated systems, unlike the spatial simple neuron models found in artificial neural systems. They are also closer to biophysical models of neurons, synapses, and related elements and their synchronized firing of neuronal assemblies could serve the brain as a code for feature binding and pattern segmentation.

The human brain consists of a large number of neurons that are interconnected with each other. On average, each neuron is connected to other neurons through about 10,000 synapses. The brain network of neurons forms a massively parallel information processing system. This contrasts with conventional computers, in which a single processor executes a sequential series of instructions.

A typical neuron consists of dendrites, soma and axon. Dendrites receive and deliver signals and act like an “input device”. Soma is the “central processing unit” that generates a signal if the total input exceeds a certain threshold (about -30 mV) and the axon transmits the signals to other neurons. Synapses are the contact points for transferring information between neurons and facilitate the connection between axons and dendrites. The pulses or spikes (also called action potentials) last about 1-2 ms in amplitude of 100 mV.

The neuron sends out spikes of electrical activity through the axon (the output and conducting structure), which can split into thousands of branches. At the end of each branch, a synapse converts the activity from the axon into electrical effects that inhibit or excite activity on the contacted (target) neuron. When a neuron receives excitatory input that is sufficiently large compared with its inhibitory input, it sends a spike of electrical activity (an action potential) down its axon. This spiking event is also called depolarization, and it is followed by a refractory period, during which the neuron is unable to fire.

In this research we investigate the integrate-and-fire (I&F) model which is based on the idea that the neuron adds and subtracts excitatory and inhibitory inputs until it reaches a threshold, at which point it fires a single impulse or action potential. The goal is to perform spiking-neuron simulations with external input signals of different wave: sinusoidal, two combined absolute sinusoidal signals, square and step wave signals and to analyze the timing and number of spikes of membrane potential.
A neural network (NN) is a massively parallel-distributed processor that stores experimental knowledge and makes it available for use. It resembles the brain in two respects: 1) Knowledge is acquired by the network through a learning process. 2) Interneuron connection strengths known as synaptic weights are used to store the knowledge. Most NNs have some sort of “training” rule whereby the weights of connections are adjusted on the basis of data. In other words, NNs “learn” from examples and exhibit some capability for generalization beyond the training data.

The Multi-Layer Perceptron (MLP) is one of the most important and widely used neural network models, which was first introduced by M. Minsky and S. Papert in 1969. It is a feedforward type network with one or more layers of nodes between the input and output nodes. The input layer introduces input values into the network. The hidden layers perform processing and classification of features, which help in determining the output. The output layer passes the output as the neural network answer. MLP network uses the back propagation algorithm in order to minimize the mean square error between the actual and the desired output.

The input patterns are presented to the network in some sequence, during the learning phase. Then each of these training patterns is propagated forward layer by layer and then an output pattern is computed. This output is then compared to the desired output and according to this comparison, an error value is determined. In order to reduce the error, the calculated error is used to adjust the weights on the connections coming into the output layer. Then the errors are propagated backwards towards the input layer, adjusting weights between hidden layers and between the input and first hidden layer.

The goal of this research is to design MLP neural network for performing the equalization of communication channels and testing its performance by using test signals. Further simulations include function approximation using 150 centers randomly selected from the input data and implementation of stochastic gradient approach and 150 randomly selected centers.
Radial Basis Functions (RBF) were first introduced in 1985 by Powell for use in multivariable interpolations. Broomhead and Lowe were the first to exploit the use of RBFs in neural networks. A special class of functions, which are called radial functions, is used for the Radial Basis Function networks to perform a nonlinear transformation on a given network input.

Radial Basis Function networks have a static Gaussian function as the nonlinearity for the hidden layer processing elements. The Gaussian function responds only to a small region of the input space where the Gaussian is centered. The finding of the suitable centers for the Gaussian functions is the main task for achieving a successful implementation of these networks. A supervised or unsupervised learning can be used for this. Usually better results are achieved by using unsupervised learning.

The first part of the simulation is the training of an unsupervised layer. The Gaussian centers and the widths from the input data are now derived. By using competitive learning these centers are encoded within the weights of the unsupervised layer. During all this process the widths of the Gaussians are computed based on the centers of their neighbors. With a Gaussian mixture, the output of this layer is derived from the input data weighted. The centers of the Gaussian functions are set from the supervised segment, after the completion of the training of the unsupervised layer and the widths of each Gaussian is determined.

This research is directed towards the solution of the following problems:

a. RBFs neural network design for performing the equalization of communication channels and testing its performance by using test signals.

b. Design of RBFs forward neural network with 36 neurons in the hidden layer for classification purposes.

c. Test the classification performance of the above neural network for inputs of given sets by using both Euclidean and dot-product measures of distance.
Independent Component Analysis (ICA), Independent Subspace Analysis (ISA) and Topographic Independent Component Analysis (TICA) are computational and statistical techniques which attempt to find hidden factors that underlie sets of random variable, measurements, or signals when the known classic methods fail completely. Independent component analysis is a method allowing the finding of underlying components from multivariate statistical data.

ICA is very closely related to the method called blind source separation (BSS), which attracted a lot of research interest in the past decade due to its potential applications in signal processing, telecommunications, and medical imaging. ICA is one method, perhaps the most widely used, for performing blind source separation. Blind source separation attempts to recover independent sources which have been linearly mixed to produce observations. Consider, for example, electrical recordings of brain activity as given by an electroencephalogram (EEG).

Blind Source Separation is used to recover source signals from a set of linear mixtures of those signals by finding an un-mixing matrix which maximizes a measure of temporal predictability for each recovered signal. This matrix is obtained as the solution to a generalized eigenvalue problem. Such problems have scaling characteristics of O(N^3), where N is the number of signal mixtures. In contrast to independent component analysis, the temporal predictability method requires minimal assumptions regarding the probability density functions of source signals. It is demonstrated that the method can separate signal mixtures in which each mixture is a linear combination of source signals with Gaussian probability density functions, and on mixtures of voices and music.

The goal of this research is to use a neural network based on Fast Independent Component Analysis (FICA) in order to separate two or more original source signals \( s_1(t) \), \( s_2(t) \), ..., from their mixtures. For example, the first signal \( s_1(t) \) is a zero-mean square wave, and the second signal \( s_2(t) \) is uniformly distributed noise in the interval [-1, 1]. The signals were artificially mixed by using the mixing matrix \( A = \|a_{ij}\| \). As a result, we generate four observable signals from the equation \( X = AS \). From the above mixture of four signals we blindly separate the original two signals. For each of the separated signals, we computed the correlation coefficients with respect to the known (actual) source signals.

\(^1\) Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Previous research shows that the public use of cell phones impacts social interaction (Cumiskey, 2003). This experiment investigated whether the use of a cell phone negatively impacts “quality time” between an adult and child. For this experiment, quality time was defined as the depiction of the time people spend together, where each participant derives happiness and a sense of togetherness from a shared activity. (The data used in this study is part of a larger study being conducted by Professor Kathleen Cumiskey in the Psychology Department of the College of Staten Island).

The 151 participants represented a heterogeneous sample of undergraduate students from the College of Staten Island. All participants were told that they were participating in a study about modern adult/child relationships. The experiment had two main conditions. The “no cell phone” condition utilized an image of an adult, without a cell phone, interacting with a child. In the “cell phone” condition, the image used was the same; however, the adult had a cell phone raised to his ear. Participants were asked to write a story about the picture from one of three perspectives. They were then asked to complete a 20-item questionnaire. This questionnaire assessed their attitude towards the quality of the interaction between the adult and child.

Participants evaluated the interaction with the cell phone present more negatively than the interaction without the cell phone (F(1,141) = 6.828; p<.01). These data show that the presence of a cell phone does negatively impact quality time. These results indicate that people need to be more conscious of how their cell phone use affects those with who they are face to face.

Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
The RBL-2H3 cell has provided an important in vitro model for understanding the biology of mast cells (MC). These cells are derived from a rat leukemia that was chemically induced. Although transformed and immortal, the RBL-2H3 cell retains important characteristics of mast cells i.e. IgE-induced degranulation. Two subpopulations of MC have been defined in the rat i.e. the mucosal mast cells (MMC) and connective tissue mast cells (CTMC). The RBL cells resemble the MMC. These cells can be induced to transdifferentiate to the CTMC phenotype by treatment with the flavonoid quercetin. Although quercetin inhibits growth of RBL cells, it is not known if this growth inhibition is reversible. We determined the proliferative potential of RBL cells after removal of quercetin with a clonogenic assay. Additionally, we examined the effect of butyrate, a known histone deacetylase inhibitor upon the morphology, growth, and differentiation of RBL cells. We found that growth inhibition by quercetin is fully reversible whereas growth inhibition by butyrate was irreversible. At the end of butyrate treatment, cells retained viability as assessed by vital dye exclusion and retention of full metabolic activity as determined by MTT reduction. However, we saw no evidence of transdifferentiation to CTMC. However, the cells treated with butyrate underwent dramatic morphological changes.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
The purpose of this research is to investigate the significant impact of Western silent cinema in non-Western countries, especially the films of Harry Houdini. This work explores how numerous Japanese people were enthusiastic about Houdini’s magic films, and how Japanese magazines depicted his films at the time.

This topic was researched at the National Library in Japan, and articles about Houdini’s films were collected and translated into English. Finally, a complete bibliography was prepared that includes the specifics about the films’ releases in Japan, which magazines picked up Houdini’s films, the title of the articles, their dates, and the location in the magazines.

It was interesting to note that these magazine articles vividly represent how the Japanese started to share the modern experiences of the moving image present in the Western world. For example, one column recounts that Junichiro Tanizaki who is one of the most famous novelists in Japan was enthralled by foreign films. We realize that Western films had a big impact on Tanizaki and affected his works, especially, his most important story: Naomi.

We plan to continue to research the influence of Western films in Japan: how Japanese accepted the new invention of cinema, and how Western culture was blended with Japanese traditions. We strongly believe that this research would be significant to expand on the subject of cinema history in both the United States and Japan.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
It is not unusual to find sex difference in play among primates that show marked physical and sexual dimorphism. Bonobos are less physically and socially dimorphic than other great apes. We investigated whether juvenile chimpanzees (*Pan paniscus*) recognize and use gender specific notions of fair-play to moderate dyadic and triadic play interactions. We coded videotapes of play behavior among infants and juveniles in a colony at the Language Research Facility at Georgia State University taken over a period of two years. A proprietary coding-software kept track of the activity and intensity of play behavior between multiple participants, including the use of objects and communicative gestures.

Our observations suggest that the juveniles had well-formed patterns of play initiation, signals for eliciting the continuation of play. The juvenile male appeared to have a higher tolerance for intense and agonistic play than the female who, nevertheless, engaged in aggressive provocation when the male was distracted or restrained by a third party Bonobo or human. The infants tended to interrupt and gently restrain the male when the intensity of rough play escalated; adult females tended to interrupt high intensity play involving their infants. We found that juvenile Bonobo males initiated predominantly rough-and-tumble play, while the female sometimes initiated “care giving” and “nesting” activity with objects such as blankets, pieces of clothing, and even a toothbrush. Our pilot data suggests that we might expect small but significant sexual differences in Bonobo rough-play behavior, and perhaps in the spontaneous initiation of “pretend” play.

1. Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
2. Taklin Software Development
3. Language Research Center, Georgia State University
The Department of Infant Development at the Institute for Basic Research in Developmental Disabilities studies the effect of low level trauma to the central nervous system on child development. They require easy, non-invasive techniques for assessing these effects. A video coding program developed to code human and animal interaction in real time allowed me to score videos of sixteen month old infants for fine motor and hand regulation skills. We observed videos of thirty children engaged in a focused attention task that consisted of three two minute trials in which a new toy was introduced after every trial. A distractor on the periphery of the child’s field of vision periodically sounded two tones followed by an animated visual image on a monitor. The infant was assigned a score of skilled or unskilled, regulated or unregulated, and assigned positive, negative or neutral affect for each of the three trials. The object of the research project was to see how accurate a simple visual assessment of motor skill and hand regulation was in the context of a set task. The score was checked against Bayley Scores of Infant Development Second Edition Mental Scale that measure motor skills and had been administered to same sixteen month old study participants. Since most of the videos were more than a year old, these performance scores were correlated with Bayley Scores on these children at 25 months, from which we could evaluate the predictive value of early motor skill deficits for performance later in development.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Many applications (heat transfer, fluid mechanics, and fiber-optic communications), require the solution of partial differential equations. Very often, due to the complexity of the equations themselves, or the geometry of the domain of interest; exact mathematical solutions are not possible and one must proceed by dissecting the differential equations and solving the resulting (large) linear or non-linear algebraic systems numerically on a computer.

The goal of the present study is to investigate how the computational work for solving such systems may be efficiently divided among a number of processors running in parallel in order to either reduce the overall computation time for fixed resolutions, or increase the accuracy of the solution for a fixed amount of computational resources. As test cases, we considered simple dissections of two well-known, time dependent partial differential equations in two spatial dimensions.

The algorithm employed for this parallelization is a simple domain decomposition: the computational domain is partitioned among available processors where the appropriate sub-set of equations are solved. Data communication between the processors is necessary to compute boundary points at the interfaces between computational partitions. The communication is performed using Message Passing Interface (MPI) software for distributed memory over parallel computers. The performance and scalability of the resulting MPI_FORTRAN codes is examined on both a local-area-network cluster of four PC’s running in parallel and on CSI’s recently acquired mini-supercomputer, a 64-node Beowulf cluster. Indeed, one may find it interesting that there is a high opportunity for speedup under these conditions. Experiments on a number of small- to medium-sized real world test problems show that in addition to speedups provided by decomposition alone, there are speedups by using more processors. These results can be extrapolated to situations with larger problems and/or more processors with a fair degree of confidence.
Colors, like languages, are a form of communication. They can convey meaning through the perceptual process, as individuals respond to different colors in varying ways. An understanding of color associations is important in many fields and industries including the visual arts, fashion, and marketing.

The purpose of this study is to examine color and its meaning. Of particular interest here is the way in which certain individual characteristics like age, gender, personality, and mood impact color perception.

A survey was designed in which respondents were given a range of mood and personality descriptors. The same individuals were then asked to make associations between 21 descriptors and 11 colors. Demographic questions were also included in the survey. The survey was administered both directly and online. There were a total of 448 respondents with 363 of them generated online.

Data were analyzed using SPSS. Results indicate that certain colors are associated strongly with particular descriptors while others have less clear associations. In terms of the moderating effects of gender and age, there was little difference among respondents’ responses to color associations. With respect to self-reported mood, it was hypothesized that the more positive a respondent’s mood, the more likely their association would include brighter colors. This hypothesis failed to be supported, as mood and personality descriptors did not seem to have an impact on color associations.

These results provide further understanding of color interpretation across different segments of individuals. They have implications for the use of color in design, marketing, and advertising. Future research might be directed towards a cross-cultural analysis to identify differences in color associations.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Post #41

Identifying Quasar Host Galaxies in the COSMOS Field

Azmat Latif

Mentor: Charles Liu
Department of Engineering Science and Physics

Studying the morphologies of quasar host galaxies can provide insight into the evolution and spatial distribution of cosmic matter during the early stages of the universe. COSMOS is a Hubble Space Telescope project that surveys a 2 square degree equatorial field and with high resolution, using the Advanced Camera for Surveys (ACS). Through the Sloan Digital Sky Survey the coordinates of 83 quasars in the COSMOS field were located. The ACS images of four of those quasars were selected, and point source function fitting and subtraction was performed on them in order to examine their host galaxy morphologies.

Poster #41

Identifying Quasar Host Galaxies in the COSMOS Field

Azmat Latif

The Importance of Undergraduate Research

I believe research at primarily undergraduate institutions is very important for two reasons. Number one, it helps the faculty keep current with their fields. It’s a stimulus to them. You know as well as I do, that students stimulate faculty as much as faculty stimulates students. And having students actively involved in research, particularly if it is a faculty member’s own project, is an added stimulant. A second reason to include an experience with real research is that it’s good training for the students to prepare themselves for graduate schools or a career. So it’s very important to have the research component in the curriculum.

Vernon J. Ehlers, US Representative (in Academic Excellence by Research Corporation)
Internationally traded services (ITS) are recognized as the fastest growing component of modern progressive economies (Axinn and MatthysSENS, 2001). Service firms, especially SMEs have recognized this potential for internationalization but have encountered obstacles in the process. These barriers vary by type and level of severity (Dicht et al., 1990; Fillis, 2000) and between individual service firms (Zimmerman, 1999). Key external barriers are: foreign competition, lack of domestic governmental support, inability to meet competitive pricing, foreign host government barriers and limited choice of distribution channels. In addition to these challenges internal barriers may encumber a firm’s capacity to instigate, expand, or maintain international operations (Winstead and Patterson, 1998). Management attitudes toward internationalization have hindered firm expansion because of lack of commitment, fear of overseas risk, lack of knowledge about foreign markets, lack of comprehension of international business procedures, in particular logistics, payments, unfamiliarity with documentation and finally, on the operational level, inadequate capacity and limited human and/or capital resources (Leonidou 1995, 2004; Bell 1997; Bauerschmidt et al 1985; Bilkey 1976; Dahringer 1991; Winstead and Patterson 1998; Zimmerman 1999). Firms may also experience psychological barriers (Bell, 1997) in the form of a short-term internationalization perspective.

This research examines the barriers that software firms encounter in their attempts to initiate internationalization or to manage existing international activities. The use of software as a single industry analysis was preferred as cross-sectional data can restrict the extent of our understanding of the internationalization process (Coviello and McAuley, 1999). The research is comparative in design, contrasting the experiences of Irish and US software firms. This study builds on, and extends, European research completed on Irish software firms which highlighted issues such as firm size and scale, market forces, market entry barriers, human resource issues and a perceived lack of domestic government support as key obstacles to firm progress. The use of strategic partnership activities appeared to lessen the effect of these barriers on respondent firms. The US research is based on a qualitative research approach using in-depth interviews with management of US SME software firms. The primary research objective is to investigate the barriers to internationalization encountered by US based SME software firms and to analyze the data to interpret similarities and differences emerging from a US and European perspective. Future internationalization challenges and differences in service sector dynamics as reported by firms in both countries will also be highlighted.
This project is based on Neil J. Balmforth’s and Roberto Sassi’s article entitled “A shocking display of synchrony” describing Kuramoto’s model of the synchronization of a population of coupled oscillators. Synchronization often occurs in many different situations in biology such as pace maker cells in the human heart or, on a larger level, the flashing of fireflies in unison. The population of coupled oscillators is modeled by a system of non-linear differential equations. A differential equation is an equation that involves certain functions and their derivatives with respect to independent variables. An ordinary differential equation (ODE) is a differential equation that involves only one independent variable. Kuramoto’s model is a system of ODE’s for the phases \( \theta_n(t) \) of a system of \( N \) coupled oscillators:

\[
\frac{d\theta_n}{dt} = \omega_n + \frac{K}{N} \sum_{j=1}^{N} \sin(\theta_i - \theta_j) \quad \text{for } n=1,\ldots,N.
\]

Here \( \omega_n \) is the natural frequency of the \( n^{th} \) oscillator and \( K \) is a given “coupling parameter”. We solve this model numerically by the Runge-Kutta Method and analyze the results by considering four possible distributions of the frequencies \( \omega_n \). First, we assume that all the \( \omega_n \) take the same constant value. Next we split the oscillators between two different frequency values. The third case uses a uniform distribution of \( \omega_n \) values, while the last case that was looked at uses a normal distribution. It was found that in all four approaches, there is some critical \( K \) value such that if a \( K \) value is chosen below the critical \( K \), the oscillators will never synchronize. The critical \( K \) value found numerically was different from the critical \( K \) value derived from theoretical considerations based on equilibrium statistical mechanics.
During the Vietnam War, political scientists began to observe that public support for American engagement in the conflict declined in relationship to mounting casualties, particularly combat deaths. In a seminal study, Professor John Mueller discovered that “every time American casualties increased by a factor of 10, support for the war dropped by about 15 percentage points.” Equally important, he found that his logarithmic relationship applied not just to the Vietnam War, but to the Korean War as well.

Following America’s experiences in Vietnam, politicians and pundits alike began arguing that, in the post-Vietnam era, Americans would be less willing to tolerate casualties in combat. Following the reactions of the Congress and the President to casualties in Lebanon and Somalia, this perception was reinforced by practice. In short, the conventional wisdom became that the American public is casualty-averse.

Over the years, however, scholars have continued to insist that, while casualties impact public support, the trauma is overblown. Most recent studies conclude that Americans are actually willing to stomach significant casualties in combat. One group of scholars indeed recently rebuked the policy community for its perpetuation of the so-called “myth of casualty-aversion.”

Our study collected the data on four wars that have captured public attention: Korea, Vietnam, Afghanistan, and Iraq. These four engagements share a variety of similarities, making them ideal case studies. All four were conventional wars. All four were regionally contained. All four were heavily covered in the media and polled. And all four involved American fatalities.

Unlike previous studies which focused on public support, we decided instead to focus on public opposition—a stronger indicator of a forthcoming political sanction that could, in turn, undermine a military operation. After documenting opposition trends in these wars, we tracked them to cumulative fatality levels.

While only in the preliminary phase of research, what we found was, while the American public is always willing to tolerate some fatalities in a war campaign, that number is not without limits. Every mission arguably has a killed-in-action (KIA) threshold. While KIA thresholds might not ever be pin-pointed until after the fact, there is reason to believe they exist. More importantly, data from the current Iraq War indicate that this KIA threshold is much lower in the current era than recent studies lead us to believe. As a result, it seems that, despite recent scholarship to the contrary, the American public might indeed be more casualty-averse in the current era.

\[1\] Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Our research efforts toward the macromolecular engineering of a novel thermoplastic elastomer (TPE) material class, based on fully aliphatic block copolymers made from combinations of polyisobutylene (PIB) and cycloaliphatic polyolefins derived via carbocationic polymerization techniques are presented. The work involved orienting experiments to find new ways to polymerize norbornene and norbornadiene. And in a second step, the conditions for the controlled block copolymerization of these monomers with macromolecular initiators based on PIB were tested.

The goal is to provide and structurally understand TPE’s of outstanding material properties and high use temperatures, and for the first time TPE’s consisting of only polyaliphatic segments. The materials will be made of potentially inexpensive feed stocks and target high-tech applications.

\[ \text{Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants} \]

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**Poster #45**

**Controlled Polymerization of Norbornene and Norbornadiene**

Olga Naglyuk1 and Michelle Nedd1

Mentor: Ralf M. Peetz

Department of Chemistry

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**Lack of Time for Undergraduate Research**

Many would insist that the major obstacle to research is the lack of time. I’m not persuaded. To be sure, life at a private liberal arts college requires balancing teaching, research, and college service, and it can be very strenuous. However, doing research usually arises from a passion for it and thrives off a psychology that finds it rewarding. There are a thousand reasons not to do it. But those reasons often apply equally to those who do and those who don’t.

An unnamed respondent quoted in Academic Excellence (a publication of Research Corporation)
A New York Times published article has claimed just that. This article provides nothing in the function of improving the current state of mismanaged higher academic admissions. The study seeks only to promote increased xenophobia propelled by a combustible media engine who’s ethical battle cry is, “If it bleeds it leads!”

WHY IS IT THAT A STUDY THAT TRADES IN OLD STEREOTYPES ABOUT BLACK INTELLECTUAL DEFICIENCIES GET FAR MORE ATTENTION FROM THE MEDIA

This overview is an outline on research directly refuting and challenging the findings so eagerly published by the New York Times. To date, our research has revealed the following:

1. Universities choose their applicants on a variety of bases; affirmative action is not at the top.
2. The bias findings of studies like the above mentioned, aide in perpetuating negative minority self-fulfilling prophecies and legislation assisted institutional racism.
3. There are publicized findings that routinely represent the results that the writer wants them to.
4. Affirmative action has worked and there are many success stories to prove that even though it's not a perfect solution, it has assisted many.
5. Affirmative action has been mismanaged and therefore its integrity has been compromised by many participating parties.
6. All “A’s” are not created equal, city/urban schools have the highest concentration of diverse ethnic children and a higher population than their higher performing suburban counterparts, yet urban/city schools are routinely under-funded and are not provided with the academic skills needed to excel and compete in a higher learning atmosphere.
7. Minority (black) students’ occasional inability to perform in higher learning environments is not indicative of racial intellectual inferiority but these reports are aimed to prove just that.
Before they do
I’ve got to get to you first
It’s just a question of time
Before they lay their hands on you
And make you just like the rest
I’ve got to get to you first
It’s just a question of time
- Depeche Mode

David R. Berkowitz was a serial killer who terrorized New York City from 1975-1977. He murdered five women, one man, and injured seven others. We know how the story ends, but it is more important, however, to know how it began. What series of events is responsible for turning a man into a killer who is now serving a 365-year sentence? This is a question that has been asked many times, even to Mr. Berkowitz himself, and yet for twenty-five years the answer has eluded us that is until today. There are several theories as to what motivated Berkowitz to commit these murders, but all of them leave us with unanswered questions and in my estimation none of them are correct. We intend to prove that our own theory, which we shall call the angels vs. whores theory, is the correct and most logical explanation for the above-mentioned events. The presentation will include our extensive research and analysis of David Berkowitz from early childhood to the present day. It will also contain our exclusive interviews with one of his victims - Robert Violante, who at age twenty was shot in the face by Berkowitz.

Cultural diversity enables all people to broaden their horizons. One of the factors that cause cultural diversity is immigration. Most of the people of different backgrounds try to fit into the society by leaving behind some of the traditions of their homeland and follow new ones.

This presentation, based on interviews with recent immigrants from Albania to the United States, seeks to address the following questions:

1. What is the “perfect” age to immigrate to the US?
2. What are some of the achievements of these immigrants?
3. Is freedom one of the reasons why they came to the US?
4. Why is life more like a melting pot?
5. What do they think about ethnocentrism?
6. What is their outlook for the future?
This study was designed to assess the stressors experienced by people in the home setting in relation to medical concerns. There are an increasing number people that are being sent home while they are still symptomatic. This leads to an increase in the number of people requiring care by family members as well as documentation of the strain on these caregivers. This was done with Neuman Systems Model (NSM) nursing theory in mind. The attempt was made to determine which stressors from the NSM were most often seen in the primary caregivers. Specific purposes were to identify “stressor” studies, describe populations studied, identify data collection methods and assessment instruments, categorize identified stressors as intra, inter, or extrapersonal in nature, identify commonalities in identified stressors and assessment methods across populations.

Cooper's (1983) five-stage integrative review process (problem formulation, data collection, data analysis, data synthesis, and dissemination) guided this project. Using Fawcett’s 2003 NSM bibliography, research studies published as journal articles/book chapters were collected and reviewed. Once stressor studies were identified, the investigators developed a coding sheet and independently reviewed each study. After independent review, investigators met to establish inter rater reliability and synthesize findings.

Of the 79 collected NSM studies, 13 were identified as stressor studies. That is, a major purpose of the study was to assess relevant stressors in a population. These 13 stressor studies concerned the following populations: caregivers (8), ICU patients (2), cancer survivors and their caregivers (2), and parents whose children were undergoing ambulatory surgery (1). One study was counted in two categories. Seven studies used investigator-developed assessment tools, 2 employed the NSM Interview Guide, 3 employed standardized tools and 1 employed no tool. The most frequent stressor study found was for the caregivers of patients at home. The most frequent stressors were lack of family support and lack of information from health care professionals (interpersonal); uncertainty about future and concern for personal health (intrapersonal); and finances (extrapersonal).

Lack of adequate information from health care professionals, was identified as being amenable to nursing intervention. This review affirmed the appropriateness of nursing diagnoses in the situation of caregiver role strain.
In this research project, we participated in monitored children’s spoken language comprehension in real time, by following their eye movements to pictures using a head mounted eye-tracker. It specifically examined how younger and older children (5-7 year olds, 10-12 year olds) and adults incrementally generate interpretations of sentences containing universal quantifiers (e.g. Every bathtub has an alligator in it). The study explored how contextual and syntactic cues are used in constructing sentence meanings on a moment to moment basis. The eye tracking technology allows us to examine how children use linguistic and contextual cues to generate meanings of sentences.

Our research thus far has focused on the piloting of sentences and pictures with adult native speakers of English. All of our data up to this point has been done without the eye-tracking equipment. Our participants (24 subjects) viewed PowerPoint slide-show presentations of stimulus materials, and made off-line choices of pictures corresponding to aurally presented sentences. We have found that adult English speakers make considerable comprehension errors (averaging 25% incorrect) with sentences containing quantifiers (Every egg is in a frying pan; Every frying pan has an egg in it). Approximately 1/3 of the adult participants performed at chance in the comprehension task.

1 Sponsored by the CSI Foundation, the Office of the Academic Deans and/or faculty grants
Model peptides are useful in the determination of the structure of complex membrane proteins. Biosynthesis of the sixth transmembrane domain of the Saccharomyces cerevisiae α-factor receptor (Ste2p) was carried out to aid in the investigation of conformational changes in this region of this G protein-coupled receptor. To isolate this domain a plasmid that coded for the expression of a thirty-nine residue peptide (M6-39; S-243 to K-269; KKKKQFDSFHISSSLVPSIIILASLKKKKK) corresponding to the 6th transmembrane domain of Ste2p was constructed. The addition of lysines at the carboxy and amino terminals was made to improve the solubility of the peptide. The M6-39 peptide was biosynthesized using an expression plasmid vector, PKLS03, which coded for a fusion protein TrpLE-M6-39. This plasmid was transformed into BL21(DE3)pLysS competent cells. The transformed cells were grown in nutrient-rich LB medium until the cell concentration density reached 0.6 (optimum density for the competent cells.) The expression of the fusion protein was induced with IPTG. The fusion protein was then isolated using mild detergent wash, and sonication. Approximately 25 mg of fusion protein was isolated per liter. The presence of correct fusion protein was confirmed by SDS-PAGE gel experiment, Western Blot and Mass Spectrometry. The calculated molecular weight of the TrpLE-M6-39 was 18,082.33 Da and the experimental molecular weight given by MS was 18,081.95 Da. The fusion protein was purified by semipreparative HPLC and M6-39 was then released from TrpLE-M6-39 by twenty four hour-long cleavage using a 5000 Molar excess of CNBr. Approximately 3.9 mg of fusion protein was cleaved with 135 mg of CNBr. The product was analyzed using HPLC under 30-50% acetonitrile +0.1% trifluoroacetic acid gradient and showed that cleavage of fusion protein to M6-39 peptide and TrpLE solvent took place.
<table>
<thead>
<tr>
<th>FACULTY MENTORS</th>
<th>DEPARTMENT</th>
<th>POSTER #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probal Banerjee</td>
<td>Chemistry</td>
<td>11, 12</td>
</tr>
<tr>
<td>William Bauer</td>
<td>Performing and Creative Arts</td>
<td>3, 4, 5</td>
</tr>
<tr>
<td>Sarah Berger</td>
<td>Psychology</td>
<td>1</td>
</tr>
<tr>
<td>Patricia Brooks</td>
<td>Psychology</td>
<td>2, 50</td>
</tr>
<tr>
<td>Bhanu Chauhan</td>
<td>Chemistry</td>
<td>10</td>
</tr>
<tr>
<td>Robert Corin</td>
<td>Biology</td>
<td>35</td>
</tr>
<tr>
<td>Kathleen Cumiskey</td>
<td>Psychology</td>
<td>34</td>
</tr>
<tr>
<td>Louis Foleno</td>
<td>Sociology, Anthropology, and Social Work</td>
<td>46, 47, 48</td>
</tr>
<tr>
<td>Natacha Geuroguieva</td>
<td>Computer Science</td>
<td>29, 30, 31, 32, 33</td>
</tr>
<tr>
<td>Eileen Gigliotti</td>
<td>Nursing</td>
<td>49</td>
</tr>
<tr>
<td>Katherine Goodland</td>
<td>English, Speech, and World Literature</td>
<td>28</td>
</tr>
<tr>
<td>Susan Holak</td>
<td>Business</td>
<td>40</td>
</tr>
<tr>
<td>Qiao-Sheng Hu</td>
<td>Chemistry</td>
<td>6, 7</td>
</tr>
<tr>
<td>Louis Klarevas</td>
<td>Political Science, Economics, and Philosophy</td>
<td>44</td>
</tr>
<tr>
<td>William L'Amoreaux</td>
<td>Biology</td>
<td>15, 16</td>
</tr>
<tr>
<td>Carlo Lancellotti</td>
<td>Mathematics</td>
<td>43</td>
</tr>
<tr>
<td>Charles Liu</td>
<td>Engineering Science and Physics</td>
<td>41</td>
</tr>
<tr>
<td>Elena McCoy</td>
<td>Biology</td>
<td>14, 15, 16</td>
</tr>
<tr>
<td>Lisa Jean Moore</td>
<td>Sociology, Anthropology, and Social Work</td>
<td>8</td>
</tr>
<tr>
<td>Fred Naider</td>
<td>Chemistry</td>
<td>17, 22, 51</td>
</tr>
<tr>
<td>Ralf Peetz</td>
<td>Chemistry</td>
<td>45</td>
</tr>
<tr>
<td>Bertram Ploog</td>
<td>Psychology</td>
<td>18, 19, 20</td>
</tr>
<tr>
<td>Andrew Poje</td>
<td>Mathematics</td>
<td>25, 26</td>
</tr>
<tr>
<td>Sonia Ragir</td>
<td>Sociology, Anthropology, and Social Work</td>
<td>37, 38</td>
</tr>
<tr>
<td>Cynthia Scarinci</td>
<td>Business</td>
<td>9</td>
</tr>
<tr>
<td>Matthew Solomon</td>
<td>Media Culture</td>
<td>36</td>
</tr>
<tr>
<td>Ruth Stark</td>
<td>Chemistry</td>
<td>13</td>
</tr>
<tr>
<td>Deborah Sturm</td>
<td>Computer Science</td>
<td>27</td>
</tr>
<tr>
<td>Bala Sundaram</td>
<td>Mathematics</td>
<td>25, 26</td>
</tr>
<tr>
<td>Stephane Tonnelat</td>
<td>Sociology, Anthropology, and Social Work</td>
<td>23</td>
</tr>
<tr>
<td>Richard Veit</td>
<td>Biology</td>
<td>25, 26</td>
</tr>
<tr>
<td>Sarah Zelikovitz</td>
<td>Computer Science</td>
<td>24</td>
</tr>
<tr>
<td>Ying Zhu</td>
<td>Media Culture</td>
<td>21</td>
</tr>
<tr>
<td>Alan Zimmerman</td>
<td>Business</td>
<td>42</td>
</tr>
<tr>
<td>UNDERGRADUATE STUDENT SCHOLARS</td>
<td>FACULTY MENTORS</td>
<td>POSTER #</td>
</tr>
<tr>
<td>--------------------------------</td>
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<tr>
<td>Ali Abidi*</td>
<td>Louis Klarevas</td>
<td>44</td>
</tr>
<tr>
<td>Smitha Abraham</td>
<td>Elena McCoy</td>
<td>14</td>
</tr>
<tr>
<td>Javier Alvarez</td>
<td>Andrew Poje,</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Bala Sundaram,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Richard Veit</td>
<td></td>
</tr>
<tr>
<td>Chad Antoine*</td>
<td>Natacha Gueorguieva</td>
<td>29</td>
</tr>
<tr>
<td>Enrico Arcaro*</td>
<td>William Bauer</td>
<td>3</td>
</tr>
<tr>
<td>Magdalena Bekinska*</td>
<td>Fred Naider</td>
<td>51</td>
</tr>
<tr>
<td>Brian Bergen</td>
<td>Andrew Poje,</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Bala Sundaram,</td>
<td></td>
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<tr>
<td></td>
<td>Richard Veit</td>
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<tr>
<td>Jonathan Blaize</td>
<td>Elena McCoy and</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>William L’Amoreaux</td>
<td></td>
</tr>
<tr>
<td>Michelle Bosco*</td>
<td>Kathleen Cumiskey</td>
<td>34</td>
</tr>
<tr>
<td>Kristina Caiazzo</td>
<td>Bertram Ploog</td>
<td>20</td>
</tr>
<tr>
<td>Jonathan Campo*</td>
<td>Ying Zhu</td>
<td>21</td>
</tr>
<tr>
<td>Corinne Cauvoti*</td>
<td>Patricia Brooks</td>
<td>50</td>
</tr>
<tr>
<td>Steven Cipriano*</td>
<td>William Bauer</td>
<td>4</td>
</tr>
<tr>
<td>Ann Marie Costella</td>
<td>Louis Foleno</td>
<td>47</td>
</tr>
<tr>
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