Cleveland State University

First Annual
Undergraduate Research Symposium

Wednesday, August 8, 2007
First session: 10:30 a.m. – noon
Second session: 1:00 – 2:30 p.m.

University Center Atrium

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Cleveland State University

2007 Undergraduate Research Symposium

Abstracts

Morning Session: 10:30 a.m. – noon

#1

Numerical Simulation of the Gas Flow and Heat Transfer Effects in a Simple Gas Spring

Manmohan Singh (Advisor: Asuquo B. Ebiana), Mechanical Engineering Department

This undergraduate summer research study is concerned with the numerical simulation of the oscillating helium gas flow and heat transfer effects inside a simple reciprocating closed piston-cylinder gas spring (volume of gas confined by a fixed cylinder and a moving piston). The gas spring domain in a Massachusetts Institute of Technology (MIT) test rig is of interest. The study attempts to mimic the oscillatory flow occurring in a 1-D Stirling engine compression space manifold. Sage and Fluent commercial numerical codes are used to obtain 1-D and 2-D computer models respectively of the gas domain and to perform the simulations.

The temperature, instantaneous pressure and velocity profiles in the gas spring at specified operating conditions are obtained using the Fluent code and compared against similar results obtained using Sage. Animations of the gas spring grid motion, transient velocity vectors and temperature contours are also documented. In general, the results are shown to be qualitatively similar with some disagreement in magnitudes.

#2

Development of an Optical Probe for the Characterization of Semiconductor Structures

Matthew Itomlenskis (Advisor: Petru S. Fodor), Department of Physics

The work performed during the Summer of 2007 has led to the development of an optical probe for the characterization of self-assembled low dimensional semiconductor materials. The optical probe designed is versatile enough to permit both absorption and photoluminescence analysis of the samples to be performed. Optical fibers were used both for coupling the excitation light to the sample, and for collecting of the emitted or reflected light and subsequent coupling into a high resolution spectrometer. The optical data collected provides information about the electronic properties of the systems investigated and their chemical stability when exposed to ambient conditions. The development and investigation of nanometer scale semiconductor heterostructures offers the opportunity to access fundamental properties of semiconductor crystals, such as band structure and refractive indices by exploiting the inherent quantum confinement of such structures to access regimes which are not achievable through compositional variation.

#3

Interaction between components of the *T. brucei* telomere complex

Imaan Benmerzouga (Advisor: Bibo Li), Department of Biological, Geological, and Environmental Sciences

Telomeres, the nucleoprotein complexes located at the ends of linear chromosomes, are essential for protection of chromosome ends from illegitimate nucleolytic activities, DNA repairs, and recombination events. The *de novo* synthesis of telomeric DNA by telomerase ensures the complete replication of linear DNA molecules. Telomere biology has been implicated in tumorigenesis and cellular aging mechanisms, and the protein complex associated with the telomere DNA is critical for telomere functions. In addition, the telomeric heterochromatic structure plays an important role in transcription regulation for genes located in subtelomeric regions in many organisms.

Trypanosoma brucei is a protozoan parasite that causes sleeping sickness in humans and nagana in cattle. In mammalian host, *T. brucei* cells regularly switch the *Variant Surface Glycoprotein (VSG)* gene expressed to evade host immune attack. Interestingly, *VSG* genes are expressed exclusively from subtelomeric regions. We have recently found that one of the telomere components plays an essential role for *VSG* transcription regulation, which is critical for parasite pathogenesis. Understanding *VSG* regulation by the telomere complex helps to develop means of eliminating this parasite.

We have just started to understand the functions of the telomere complex in *T. brucei,* which turned out to be similar as in mammals. In this study, interactions between various telomere proteins (TPP1, TRF, Tin2 and Rap1) are characterized using the yeast two-hybrid analysis. Different *T. brucei* telomere protein genes are subcloned into yeast 2-hybrid vectors. After confirming the DNA sequence for the constructed plasmids, the plasmids are introduced into yeast 2-hybrid reporter cells and protein-protein interactions are analyzed by measuring β-galactosidase activity using an ONPG-based liquid assay.

#4

Purification of the catalytic subunit of Aspartate Transcarbamoylase from *Methanococcus jannaschii*

Khadidja Benmerzouga (Advisor: Jacqueline Vitali), Department of Physics

Organisms from the archaea, prokarya, and eukarya kingdoms all produce aspartate transcarbamoylase (ATCase), the key enzyme in the biosynthesis of pyrimidine nucleotides. ATCase has many forms in different organisms. *Methanococcus jannaschii* is a barophilic and hyperthermophilic archaeon. In this organism, ATCase contains catalytic subunits which are homotrimers of a polypeptide chain with 306 amino acids. During Summer 2007, we have been purifying the catalytic subunit of *M. jannaschii* ATCase. The purified protein is to be crystallized under controlled conditions and in the presence of substrate analog and inhibitors. The information derived from the study should help understand how the catalytic function of *M. jannaschii* ATCase adapts to high temperatures. In this poster, we will describe our efforts in purifying this protein.

#5

Cleveland Women in World War II: Fighting for Freedom and Themselves

Ashley Taylor (Advisor: Robert Wheeler), Department of History

In America, World War II was an era of change and development. One of the most poignant changes occurred in the societal role of women. Women in Cleveland, like women elsewhere in America, were experiencing radical changes in their lives. Many were left at home with limited or no means of supporting themselves and their children. Still, they were determined to meet the challenge; many women left home to work for the first time, working as nurses or day care providers, or pursuing less feminine careers in steel mills and rubber factories. Other women took to serving their countrymen any way they could, joining philanthropic societies who organized blood drives and raised money. Still others were motivated to attempt to get to the front line, joining organizations such as the Red Cross and the Women's Army Corps. There were many new options open to these women, but none of them were easy, particularly for African American women suffering from racial inequality but still wanting to serve the government that helped oppress them. Despite the tumultuous nature of the war years, Cleveland women were able to rise to meet the challenges that faced them in a hard and often unfair world.

#6

Investigating talker variability in the perception of native- and foreign-accented speech

Ellen Bronder and Anne Sito (Advisors: Conor T. M^{c}Lennan and J. González [University Castellón, Spain]), Department of Psychology

Previous research by M^{c}Lennan & Luce (2005) demonstrated that talker effects (i.e., slowed recognition of spoken words due to a change in talkers) are more likely when processing is relatively slow. We extended this previous work by conducting two experiments designed to investigate talker variability in the perception of native- and foreign-accented speech. We hypothesized that spoken word processing would be significantly slower for listeners presented with foreign-accented speech than for listeners presented with speech produced by native speakers (and thus produced without a foreign accent). Consequently, we further hypothesized that we would obtain more robust talker effects in foreign-accented speech as a result of relatively slow processing. Our results confirmed these hypotheses: the results of Experiment 1 demonstrate talker effects for English words produced with a Spanish (foreign) accent, and the results of Experiment 2 demonstrate talker effects for Spanish words produced with an English (foreign) accent, but not for words produced with a Spanish (native) accent. The results add to our knowledge of the circumstances under which variability affects the perception of spoken words.

#7

Effect of Steel Slag Replacement on Fresh and Hardened Properties of Concrete

Richard S. Obratil (Advisor: Paul Bosela), Department of Civil and Environmental Engineering

In 2006, the United States saw the production of 21.5 million tons of iron and steel slag, of which 40% would be classified as steel slag. Although steel slag is currently used as an aggregate in Hot Mix Asphalt surface applications, this paper examines the feasibility of utilizing this industrial by-product as a replacement for both fine and coarse aggregate in conventional concrete mixtures. The first phase of this research examined the effects on the fresh and hardened properties of concrete caused by replacing a percentage of the volume of both fine and coarse aggregate with steel slag available in the Northeastern Ohio area. The basis for comparison was the Ohio Department of Transportations Class C option 1 concrete paving mixture. During this program, three types of steel slag were utilized. The fresh concrete properties of workability, air content and unit weight, and hardened properties of compressive and splitting tensile strength were examined per standard ASTM guidelines. This preliminary investigation demonstrates that the specifications called for by the Ohio Department of Transportation can be met. Further study is necessary to assure that the performance of the finished pavement is not degraded.

#8

The Married Woman's University: A Lesson in Women's Clubs, 1860-1950.

Jenna Ogden (Advisor: Robert Wheeler), Department of History

Although historians considered the women's clubs of Cleveland from 1860 to 1950 trivial tea parties, they represented domestic feminism, an alternative to suffragist feminism which broadened women's opportunities and intellect while maintaining traditional domestic values. According to Karen J. Blair, members gained fellowship, confidence, and education. Women seeking membership to The College Club of Cleveland and The Women's Art Club of Cleveland had to be sponsored by two to three current members. This method kept the clubs uniform and elite gatherings of white, middle-aged, upper-middle class women, and excluded those from low income and African American families. Literary and study clubs allowed women to grow intellectually and gain research and writing experience. After 1920, the year of women's suffrage, women's clubs became focused on civic issues instead of personal intellectual development. A women's police bureau was established in 1924 due to the efforts of The Women's City Club of Cleveland. Also, The Women's Rights Society of Cleveland worked to place women in all departments and levels of government employment to expand their influence on society. Women's clubs of various religions, nationalities, income levels, and races warrant further investigation by researchers.

#9

Study of the biological functions of Cyclovirobuxine D

Salaam Saleh, Imaan Benmerzouga, and Ji Min (Advisor: Aimin Zhou), Department of Chemistry

Many natural molecules display a diversity of biological functions and have been used as drugs for treating disease. Cyclovirobuxine D, a compound isolated from the box plant in China, is being used to treat angina and myocardial infarction in clinics in China. However, the molecular mechanism of the compound action is largely unknown. We are investigating the effect of ZW-3, an analog of Cyclovirobuxine D, on cell signaling. Interestingly, we have found that ZW-3 is able to activate both the mitogen activated protein kinase (MAPK) and IκB/NFκB pathways in A10 cells, a rat embryonic myoblast cell line, and Raw cells, a mouse macrophage cell line. ZW-3 treatment induced the phosphorylation of extracellular signal-regulated kinase (ERK) and degradation of IκB-α. The MAPK and IκB/NFκB pathways have been demonstrated to be involved in cellular proliferation. Thus, our results suggest that the beneficial effect of Cyclovirobuxine D on patients with heart diseases may be through promoting the recovery of damaged cardiovascular cells.

#10

Centrobix

Serena Hendricks, Oana Huluta, and Gene Sardon (Advisor: Thomas Whipple), Department of Marketing

Developed for Iso Fit International with a group of Aikido experts and input from medical professionals, Centrobix is a program for better balance, which will in turn lessen the likelihood of an accidental fall. Additionally, Centrobix is an exercise routine that acts on changing the muscle memory and reflexes. These results are accomplished by changing the way a person falls to avoid getting injured.

The project provides detailed data analysis about the need of the product in England. Based on the results found, the Centrobix product should not enter the England market because there is no need for the product with very few people owning fitness videos (see chart). There are also many barriers to entry such as distribution in the retail stores. Also, strict health programs must approve the video for its claim of helping with fall prevention. Another reason supporting the conclusion is that the main distribution of Centrobix videos is over the Internet and people in England rarely purchase videos over the Internet. The certification program could be a success due to the fact that managers and Fitness Trainers said that it would be good to know how to teach their pupils the fall techniques.

10 so far

#11

Targeting androgen receptor by miRNAs in prostate cancer

Jinani Slaibi, Kavleen Sikand, Siddharth Patil, and Tiffany Kaul (Advisor: Girish Shukla), Department of Biological, Geological and Environmental Sciences

Prostate cancer is a second leading cause of cancer related illness and death among men in the United States. The androgen receptor, a ligand dependent transcription factor and its cognate ligand androgens, have been implicated in almost one third of the prostate cancer cases. The hormonal blockade therapy, which is designed to inhibit the expression of the receptor, however fails and almost all patients progress to hormonal-refractory stage and die from the cancer. Therefore, novel molecular approach that can target and obstruct the expression of the androgen receptor is urgently required. Micro RNAs (miRNAs) are small non-coding RNA molecules of 19-24 nucleotides in length, found in multi-cellular organisms, where they regulate gene expression by targeting various mRNAs. Mis-regulation of miRNA expression has been linked to many types of cancers. Using bioinformatics methods we found that human miRNA designated Hsa-miR-488 has the potential to bind to the 3' untranslated region of the mRNA of androgen receptor. In this project we are attempting to target the expression of androgen receptor by overexpressing miR-488 in human prostate carcinoma cells. We anticipate the miRNA mediated repression of the receptor would block the activation of various carcinogenic signaling pathways which are implicated in prostate cancer.

#12

Cloning, Expression and Purification of the Murine Inducible Nitric Oxide Synthase Mutants

Heidi Vielhaber and Rati Lama (Advisor: Camelia Gogonea) Department of Chemistry

Nitric oxide synthases (NOS) are a family of enzymes that produce nitric oxide (NO) and L-citrulline from L-arginine in the presence of NADPH and O_2. There are three types of nitric oxides synthesis: nNOS, iNOS, and eNOS. The object of our present study is the murine oxygenase domain of the iNOS. Our main objective is to study the role of Arg_{193} in binding the heme in $iNOS_{oxy}$. After wild type $iNOS_{oxy}$ was modified by PCR to contain a His_6 tag at the C-terminal, and cloned into pCWori expression vector, we mutated the Arg_{193} residue into Asp, Glu, Gly, Lys, and Phe by oligonucleotide-directed mutagenesis. After cloning the mutated inserts into the same pCWori vector, we started the protein expression and purification of the wild type and the Glu_{193}, Lys_{193} mutants by gravity-flow chromatography. Our results show a very low protein expression for Glu_{193} and Lys_{193} mutants versus the wild type.

#13

Identification of functionally relevant sequence elements of miRNAs encoded in nuclear pre-mRNA introns

Siddharth Patil, Tiffany Kaul, Jinani Slaibi, and Kavleen Sikand (Advisor: Girish Shukla), Department of Biological, Geological and Environmental Sciences

Numerous cell processes including transcription, nuclear pre-mRNA splicing, nonsense mediated decay, and translation are influenced by a variety of cis-acting regulatory sequences which are found in the human genome. It is certain that human genome contain numerous other unidentified and uncharacterized elements which are important for the optimum gene expression. Therefore the identity of such cis-regulatory elements and their functional significance is imperative to understand their role in human gene expression. A number of recently discovered noncoding RNAs known as micro (mi) RNAs are encoded within the noncoding (intron) regions of a variety of functionally important human genes. We are interested in deciphering the roles of miRNA and their 'genomic neighborhoods' in the gene expression cascade. Using a bioinformatics approach, we want to identify and catalog regulatory sequence elements that are found in the genomic regions of 85 human and 7 mouse miRNAs host introns. Using a genome wide comparative genomics approach, we are developing a dataset containing miRNA sequence information from mammalian genomes. The dataset would comprise the information such as the size of introns, size of exons, intronic splicing silencers, exonic splicing silencers, splice sites and RNA binding protein motifs. The identification and functional evaluation of these regulatory motifs and elements would help us to understand their roles in coordinated events of nuclear pre-mRNA splicing and miRNA processing.

#14

Effect of Spatial Resolution on Measurement of Aortic Compliance Using MRI

Cathy O'Grady, Randy Setser, Sushma Srinivas, and Navneeth Sagar Reeddy Lakkadi (Advisor: George Chatzimavroudis), Department of Chemical and Biomedical Engineering

Background: The human aorta is a compliant artery which normally increases in cross-sectional area by 15-20% as blood is pumped through it; however, it can stiffen with age and disease. Magnetic resonance imaging (MRI) has been used in numerous research studies to measure arterial distension, but the effect of image spatial resolution on errors in distension measurements has not been evaluated.

Purpose: To examine the effect of spatial resolution on measured vessel distension using MRI and an *in vitro* model of the human aorta.

Materials and Methods: Using a pulsatile flow phantom, physiologically realistic flow was generated in a section of latex tubing (1" inner diameter) located inside a MRI scanner. Images were acquired at various degrees of tube distension with spatial resolution (pixel size) varying from 0.5-2.3mm^2. Tube cross-sectional area was computed using image analysis software, from which distension was computed.

Results and Conclusion: The measured change in tube area was generally consistent for all pixel sizes, averaging 0.38cm^2 (range 0.30–0.47cm^2). Percentage change in tube area averaged 9% (range 7%-11%), analogous to the expected distension in a diseased aorta (although the 1" diameter is normal). Thus, we have found no significant effect of spatial resolution on distension measurements over the studied range of pixel sizes.

#15

Markov Chains

Thomas Majercik (Advisor: Barbara Margolius), Department of Mathematics

A Markov process is a random process. In a Markov chain the probability of going from any future state given the past states and present state is dependent only on the present state. These states are usually numbered $X = \{0,1,2,\ldots\}$ but can take any finite value as long as each is unique. If $X_n = i$ then the process is said to be in state i at time n.

For any continuous-time Markov process, there is a rate at which transitions occur in the system. These rates can be constant or vary with time. In order to find a numerical solution, we have to create a rate transition matrix. If the rates are constant, a numerical solution is relatively easy to find. But, if the rates vary with time, then all entries depend on time (t), and the matrix becomes a function of time. The purpose of this project is to find numerical solutions to variable size Markov chains with time varying rates using the Matlab programming language.

#16

Fluid Line Dynamics

Mag Mallisk (Advisor: William Atherton), Department of Mechanical Engineering

I am researching fluid line dynamics. I am using a motor-pump assembly from Vickers equipped with a direct-operated proportional DC valve from Parker. The motor-pump assembly pumps fluid through a long thin line, ¼" steel tubing that is 48' long is used. The proportional valve is used to introduce disturbances in the system. The dynamic pressure is taken coming in and going out of the assembly using piezoelectric pressure sensors from PCB Piezotronics. The pressure readings are then used with partial differential calculus and other forms of math to form equations for the interesting fluid line dynamics.

#17

The Effects of Climate Change on *Plethodon cinereus'* Foraging Rates.

Angela Stuczka and Owen M. Lockhart (Advisor: Michael Walton), Dept. of Biological, Geological and Environmental Science

The ability of amphibians to adapt and persist given the current rate of climate change is of major concern to conservation biologists. As part of a research program to evaluate the effects of climate change on amphibians, we studied how temperature affects feeding behavior in the red-backed salamander (*Plethodon cinereus*). This study examines foraging rates of two *P. cinereus* color morphs, striped and un-striped, at two temperatures and three densities of prey. Our objectives were to investigate effects of (1) prey density on feeding rates, (2) temperature on feeding rates, and (3) differences in feeding rates between the two color morphs. Prey density had no significant effect on feeding rate for either color morph. Temperature and color morph displayed a significant interaction, with un-striped morphs feeding at a lower rate at 15°C but at a similar rate to striped morphs at 20°C. This study provides evidence that there are ecologically meaningful trait differences between striped and un-striped morphs. Based on these results, the potential consequences of climate change on *P. cinereus* include: alterations to food webs and ecosystem processes, changes in salamander population structure via differential selective forces, and extirpation of salamanders if rates of climate change exceed adaptive potentials.

#18

Molecular Regulation of Protein Translation During Skeletal Myoblast Differentiation and the Coordinated Apoptosis

Katherine Smetana and Atossa Shaltouki (Advisor: Crystal M. Weyman), Department of Biological, Geological, and Environmental Science

When skeletal myoblasts are cultured in differentiation media (DM: media without serum), roughly 30% undergo apoptosis between 3 and 12 hours while the remaining 70% undergo differentiation between 24 and 48 hours. Both the process of differentiation and the process of apoptosis in this system rely on new protein synthesis. It is well known, however, from studies in other systems that culturing cells without serum leads to a decrease in global protein synthesis. Others in the lab, therefore, assessed global protein synthesis when 23A2 myoblasts are switched from growth media (GM: media with 10% serum) to DM and discovered that total protein synthesis decreases by 3 hours, but then recovers by 12 hours to that level found in GM. The goal of this research is to explore the molecular mechanism that is responsible for regulating the decrease of total protein synthesis after 3 hours of culture in DM as well as the recovery after 12 hours of culture in DM. Others in the lab have also shown that PI3K activity in myoblasts cultured in DM initially decreased but then recovers to that found in GM. Since PI3K is known in other systems to signal through mTOR to phosphorylate 4-EBP and phosphorylated 4EBP allows protein synthesis, we examined the phosphoryaltion/activation of mTOR and the phosphorylation of 4EBP when myoblasts are cultured in DM. We found that mTOR phosphorylation also initially decreases but then recovers to the level found in GM. However, while the phosphoryaltion of 4EBP does initially decrease it does not recover. Thus, since the phosphorylation status of 4EBP does not correlate with global protein synthesis, we focused our attention on eIF2alpha, another important regulator of protein synthesis. We found that the phosphorylation status of eIF2 alpha does correlate with global protein synthesis. Further, we present data to suggest that the kinase responsible for phosphorylating eIF2alpha is PKR and that PKR may be activated by caspase mediated cleavage.

#19

CleveMed: Marketing Wireless Medical Devices in England

Summer N. Blakeny, Marija Luketina, and Anna Sobkiv (Advisor: Thomas Whipple), Department of Marketing

Robert Schmidt, founder and chairman of Cleveland Medical Devices, requested assistance with gathering appropriate documentation needed for entering the company's products into England's market. The goal for Cleveland State University's marketing researchers was to prepare a "How to" guide for introducing CleveMed's wireless medical products to England's market. Specifically, the guide was to focus on the Crystal Monitor PSG Series, which are products of the company's Sleep Disorders division. Information gathered during this foreign study project will contribute to the company's international expansion ventures.

The marketing students performed extensive independent research in London, analyzing CleveMed's main competition for sales and manufacturing of wireless medical devices in England, as well as researching the legal regulations and guidelines imposed by the British division of Center for Devices and Radiological Health for wireless medical devices. The most instrumental component of the marketing study was meeting with Dr. Irshaad Ebrahim of the London Sleep Centre, who agreed to be the foreign liaison to CleveMed and help market their products in England's market.

#20

The Evolution of the Secession Arguments

Alicia Pavelecky (Advisor: Robert Wheeler), Department of History

The early to mid 1800s proved to be a pivotal time for the United States, in which the fate of hundreds of thousands of men was decided. This period in American history is marked by the debates over the nation's stance on slavery. Because the nation was so divided in its views, the result of these debates was the secession of the southern states and the American Civil War. A thorough examination of the evolution of these secession arguments is needed to determine whether or not the war was necessary. Although the exact date of when the sectional unrest and debates over the institution of slavery really began is unknown, it is certain that this problem had been evident at least from the ratification of the Constitution. The question of what the country would do with slavery was far from answered, however, and throughout the next 70 years tempers flared and discussions became increasingly heated about what to do about slavery. Matters became progressively worse when California entered the Union as a free state, and the topic of secession became much more popular after this point until the southern states finally departed from the Union, and the Civil War began.

#21

Controlling a swarm of robots and mapping a building

Steven Shanfelt (Advisor: Dan Simon), Electrical and Computer Engineering Department

A robotic swarm is a group of robots working together to achieve a common goal. The goal is to map a building. Each robot on its own is capable of very little. When put together, however, the robots can accomplish a great deal. The robots are controlled from a central location, a computer called the base station. The focus of this poster is the design of the base station program.

#22

An Investigation of the Relative Efficacy of Channel of Communication on the Introduction of a Mission Statement

Gregory McDaniel, Avinash Surapaneni, David Edwards, Tiffany Mattox, Sarah Anderson, and Jessica Leslie (Advisors: Robert Whitbred, Evan Leiberman, and Cheryl Bracken), School of Communication

Developing and implementing mission statements continues to be a widely used managerial strategy in all types of organizations. Little or no research has focused on the influence of different strategies for introducing the mission to members of organizations. This study begins to address this need by examining the relative efficacy of using a video tape versus a paper introduction of mission statements. An experimental design was used. A page long introduction to the mission statement of Cleveland State University was developed that: a) introduced the university, b) specified the mission statement, and c) provided three paragraphs, each of which framed one of the major themes of the statement. For the tape condition, President Michael Schwartz was recorded presenting the mission statement. For the paper condition, the introduction was provided on letterhead from the President's office. Students enrolled in summer classes participated in the study. Results suggest: a) the channel of communication had no significant influence on the immediate recall of the content of the statement, b) participants in the paper condition perceived the source of the message to have higher credibility, and c) perceptions of credibility influenced the extent to which participants perceived the mission statement as being important. These results are discussed, along with implications for future research.

#23

The Influence of Individual and Organizational Perceptions of Mission on Job Satisfaction

Gregory McDaniel, Avinash Surapaneni, David Edwards, Tiffany Mattox, Sarah Anderson, and Jessica Leslie (Advisors: Robert Whitbred, Evan Leiberman, and Cheryl Bracken), School of Communication

The development and implementation of mission statements continues to be a widely used managerial strategy in all types of organizations. Relatively little is known about the dynamics underlying how mission may influence important attitudinal outcomes of organizational members. The concept of integration (McGregor, 1960) suggests that members who perceive their activities are contributing to the overall goals of the organization will be more likely to have higher levels of job satisfaction and motivation. This paper extends this line of reasoning to the study of organizational mission, hypothesizing that members whose interpretations of their individual mission within the organization overlaps with their interpretations of the mission of the organization as a whole will be more likely to be satisfied with their job. This hypothesis was tested using data collected from the Public Works Division of a US military base. Results provide preliminary support for this hypothesis.

#24

Reaction Shots: A Window to Perception

Daniel A. Griffith (Advisor: Evan Lieberman), School of Communication

Reaction shots are an imperative component of the cinematic language. Typically, such shots involve facial or physical gesture and represent a diverse set of emotive reactions with varying degrees of intensity or subtlety. It has long been understood by filmmakers that showing how a character reacts to an event can be more dramatic or illuminating than the incident itself. Reaction shots vary widely and work to convey dramatic, contextual, and sub-textual information, while simultaneously setting the tone of the story. As important as they are, there is little academic research into their affect from the spectator's perspective; and their proper use is nearly a trade secret within the production industries. It is our intention to theorize a typology of reaction shots that will enable the scholar or filmmaking student to understand precisely how they work, and how they can be formulated to produce the preferred response and the desired emotional tone of the story. The :F:RAMES research team has begun preliminary research into this topic through the construction of such a taxonomy based on content analysis which will then be tested by a survey instrument.

#25

"Fed Like a Cold or Starved Like a Fever": A Look at Effective and Ineffective Social Support Systems During a Wartime Deployment

Ellauna Evans (Advisor: Katheryn C. Maguire), School of Communication

Social support systems have a profound effect on how people cope with their stress while enduring arduous situations. During wartime deployments, spouses of those that are serving in the military begin to rely on their social support system to cope with the deployment. Typically, a social support system is implemented to provide comfort, assurance and consoling; however this it not always the outcome. Quite often, military spouses have social support systems varying from two extremes: the spouses left behind are left to fend for themselves when it comes to social support or, their spouse, family and/or community members blanket them with support. This implores the question: why are some social support systems failing while others are excelling? Interview transcripts of seven Army wives whose husbands were deployed to either Iraq or Afghanistan between 2003 and 2005 were examined in an attempt to explain the difference between the supportive and unsupportive social support systems. This poster presentation explores the degree to which the social support systems of these seven women were actually helpful or unhelpful to the spouses, and discusses what can be done to help create and sustain a more effective social support system.

#26

Robotic Swarm Project: Radio Communication

Ishu Pradhan (Advisor: Dan Simon), Electrical and Computer Engineering Department

Since it is impossible and impractical to use wires to send and transmit data between robots and the base station, a wireless form of communication was required. While there are numerous forms of wireless communication available, radio communication seemed to be a perfect fit for this project. Unlike other forms of communication, radio communication can transmit signals through various obstacles which is why it is still very popular and widely used. Radio communication is basically a way of transmitting signals from one point to another as an electromagnetic wave. In this project, all the data are transmitted through the transmitter by modulating electromagnetic waves with respect to the binary representation of the data. Once the waves pass through the receiver, it will convert those waves back to the binary data and send them to the microcontroller.

#27

Robotic Swarms Project: Dead-Zone Switch, Ultrasonic Sensors and Motors

Samarth Mehta (Advisor: Dan Simon), Electrical and Computer Engineering Department

According to one of the Isaac Asimov's rules for robots, the robots must be able to protect themselves provided that they are harmless to human beings. So, robots have dead-zone switches to protect themselves from falling from a height. Once the robot recognizes that there is a danger for its survival, it stops and moves back and stops again. The robots also have ultrasonic range finders to find the distance between an object or a wall and the robot. Since, this robot is a wheeled robot, it requires motors. These motors are controlled through PWM module of the microcontroller, which is a brain of the robot.

#28

Aspect Ratio Study

John Zazik III (Advisor: Kim Neuendorf), School of Communication

It is very common for films today to be shot in one aspect ratio and then shown in a different aspect ratio. Because of this frequent practice, techniques such as pan-and-scan, letterboxing, and pillarboxing have been used to modify either the dimensions of the display device or the image itself. If the image is modified, significant changes to the content of the picture may occur. As a result, the question arises as to what effect, if any, this change in image dimension has on audience comprehension and appreciation of the dramatic material. This is particularly the case with the pan-and-scan technique in which portions of the original image are excised and entirely new compositions are created. The :FR:AMES group has designed an experiment using Applied Science Laboratories' eye-tracking technology in which subjects will be shown a variety of still and moving images. The subjects will then be asked to answer questions using MediaLab software that are designed to measure the effect of this aspect ratio transformation. The goal of our study is to help scholars and producers better understand the effects of the relatively unexamined phenomenon of aspect ratio transformation.

#29

Traditional Healing and Medicine in South India

Diana A. Llapa (Advisors: Ron Reminick, Lonnie R. Helton, Murali Nair, Todd J. Pesek), Department of Health Sciences

Modern medicine has become highly popular in Western society and it is used more often than what it is needed in our daily lives. Traditional medicine is seen as an alternative form of healing and often seen as a last option to use in Western society.

Cultural traditions around the world look at healing from a preventative perspective and mainly use traditional healing and herbal medicine for primary healthcare and wellness. There are many similarities between cross cultural healing. The reoccurring themes in healing are in the integration of the mind, body, spirit, and environment around us. We can see this between traditional healers/elders from different tribes in the Western Ghats in South India. Also seen is the importance and concern for these traditional healers/elders to preserve their knowledge on traditional medicine, and preservation of the environment.

#30

Mechanics of Movement on Tree Branches: Limb Position and Torque in the Gray Short-tailed Opossum.

Timothy Gauntner (Advisor: Andrew Lammers), Department of Health Sciences

Quadrupedal animals which frequently move on tree branches face unique challenges to maintaining stability. The mechanics by which an animal grips a branch and applies forces to it may clarify the means by which animals remain stable on arboreal supports. Five gray short-tailed opossums (*Monodelphis domestica*) were trained to move across a simulated branch trackway about half the diameter of the animals' bodies. A 4-cm region of the trackway was instrumented such that it could measure vertical, fore-aft, and mediolateral (side-to-side) forces. Four separate vertical sensors allowed us to measure torque around the long axis of the branch and through a mediolateral axis. This allowed us to calculate the torque (twisting) around the long axis of the branch trackway. Limb contacts were filmed from three different camera angles. Video was uploaded to a computer and digitized into a single set of three-dimensional coordinates, modeling the precise grip location of the hand and the foot on the trackway branch. There is no correlation between torque and limb position or peak resultant force. Peak resultant force, however, is correlated with limb position such that when the limb is higher on the branch, the peak resultant is greater. As was expected, the data also indicate that the peak resultant generated by the forelimb is much greater than that generated by the hindlimb. The reason for this is that the animal's center of mass is closer to the forelimbs than to the hindlimbs. We found that speed is positively correlated with vertical position of the limbs on the branch for forelimbs only; because peak resultant force is positively correlated with speed it is possible that the animals could not run as fast when their limbs contacted the side of the branch rather than the top of the branch.

Some posters may not be represented in this abstract booklet because their abstracts were submitted after booklet printing. We appreciate the efforts of all poster presenters, their co-workers, and their advisors.

Afternoon Session: 1:00 – 2:00 p.m.

#76

***Ab Initio* Calculations on the Thermodynamic Properties of New Potential High Energy Materials**

Ryan M. Richard (Advisor: David W. Ball), Department of Chemistry

We have evaluated the usefulness of several groups of molecules as new potential high energy materials using *ab initio* calculations at various levels of theory. The molecules involved in these studies were aminoborane, diaminoborane, triaminoborane, triazane, cis- and trans-triazene, borabenzene, three isomers of diborabenzene, and three isomers of triborabenzene. For each molecule we have calculated the optimized geometry, vibrational spectra, and specific enthalpy of formation. Our results indicate that of all the molecules involved in these studies, 1,2,3-triborabenzene gives off the most energy at about 62 kJ per gram upon combusted.

#77

Magnetic Characterization of Large Arrays of Nanomagnets

Viktor Kitsis (Advisor: Petru S. Fodor), Department of Physics

A magnetic hysteresis curve tracer for characterizing magnetic materials has been developed. The experimental set-up takes advantage of the coupling between a probe laser beam and the magnetization of the sample investigated. In this approach, upon reflection from a magnetized sample the polarization of an optical beam is rotated by an amount proportional with the magnetization of the sample (Kerr effect). The amount of rotation of the polarization axis is measured using a polarization bridge and is directly related with the magnitude of the magnetization. The magnetic measurement system will be used to measure the magnetization of high density arrays of low dimensional magnets, with possible applications for storage media.

#78

Nonlinear Analysis of Surface Electromyography Time Series

Brian Vyhnalek (Advisors: Ulrich Zurcher, Miron Kaufman, and Paul S. Sung), Departments of Physics and Health Sciences

We are using the Shannon entropy to characterize the complexity of surface electromyography (EMG) time series. Surface electromyography (EMG) is used to assess patients with low back pain. In a typical EMG measurement, the voltage is measured every millisecond. We observed back muscle fatiguing during one minute, which results in a time series with 60,000 values. In general the time dependence of the entropy shows a crossover from a diffusive regime to a regime characterized by long time correlations (self organization) at about 10ms. We believe that the entropy plateau value represents an intrinsic measure of the health of the muscle. Hence, it could be used to differentiate between low back pain and healthy individuals.

#79

Examining Talker Effects in the Perception of Spoken Language

Anne Sito and Ellen Bronder (Advisor: Conor T. M^{c}Lennan), Department of Psychology

The Language Research Laboratory was established at Cleveland State University in 2006. One of the main aspects of our research program is to examine talker effects in spoken word recognition. In particular, we are interested in examining the circumstances under which changes in talkers affects listeners' perception of spoken words. Based on previous work by M^{c}Lennan and Luce (2005), we have developed several hypotheses regarding the role that talker changes will play during the perception of spoken language. In particular, we predict that talker effects will be more robust when processing is slow, relative to when processing is fast. We further predict more robust talker effects when bilinguals are processing words in their L2, relative to processing words in their L1. Similarly, we predict greater talker effects when listeners are processing foreign-accented speech, relatively to processing native-accented speech. Finally, more robust talker effects are predicted in older adults, relative to younger adults. We are currently conducting a number of experiments – using a variety of experimental techniques – designed to test these hypotheses. The results of our studies will add to existing knowledge regarding the circumstances under which talker effects are obtained during the perception of spoken words.

#80

Creating Mathematical Applets in Flash

Erika Mignogna (Advisor: Barbara Margolius), Department of Mathematics

The purpose of this project is to create instructional applets in Flash to help students learn multivariable calculus concepts. The MAA PREP workshop *Flash at the Beach* provided training in both Adobe Flash CS3 and ActionScript programming. With the help from this training, various mathematical applets that illustrate different topics covered in multivariable calculus were created. These applets are intended to supplement the textbook used for the course. The interactive applets will allow students to visualize complicated concepts. In addition, several of the applets test students on their knowledge and may be useful for homework review and preparation for exams. Students registered for MTH 281 will have access to these materials through Blackboard.

#s 81 – 85

(The following abstract applies to the next five posters.)

Through Students' Eyes: Urban Youths' Perceptions of the Purposes of, Supports for, and Impediments to School

Teams: Michelle Taylor-Fox and Erin O'Connor
Jackie Myers and Jillian Holt
Laura Skehan and Katie Marshall
Vera Rozman and Laura Shank
(Advisors: Kristien Marquez-Zenkov and Jim Harmon [Euclid High School]),
Department of Teacher Education

Eight undergraduate/post-baccalaureate students in the College of Education and Human Services (COEHS) have served as the lead investigators on this project. All will be completing practicum, student teaching, or a major field experience during the Fall 2007 semester, and this project has provided them with an additional field experience. They were interested in integrating research methods into their teaching practices, and they appreciated that the tangible products of this project have highlighted their commitment to urban students and teaching.

The Cleveland State University COEHS is the primary preparation site for Cleveland area teachers. Many COEHS graduates are trained and will eventually be hired to teach in the urban districts in this region. This research project attempted to bridge a unique and troubling gap between these future teachers and their future city students: urban teachers and youth frequently hail from vastly different communities and cultures, and, as a result, they have widely varying relationships to school. This project has provided a mechanism for these future teachers to inquire into city students' perceptions of school and their lives, gaining an understanding of high school students' experiences so that these educators might better relate to their future students, help them engage with and remain in school, and promote their academic success.

This project has responded to extremely high school dropout rates, low literacy achievement scores, and a general community disengagement from school. The project has also helped these future teachers to become more "culturally competent."

"Through Students' Eyes" at Euclid High School has relied on the format and foundations of this project as it's been implemented at Cleveland's Rhodes and Lincoln-West High Schools. Twenty Euclid High School students have participated across this summer experience, working with these eight COEHS students to use photography and writing to document their relationships to school.

This project used a "critical pedagogy" framework and visual sociology methods to investigate, critique, and challenge the realities of city students' lives and perceptions of school. The Euclid students addressed four questions via both photography and written reflections:

1) What do you believe are the purposes of school?
2) What supports your success in school?
3) What impedes your school success?
4) What supports/impedes your success with math, science, social studies, English, and/or art?

COEHS student researchers have begun to content analyze Euclid students' photographs and writings, documenting prevalent and outlying visual and descriptive topics and themes. Researchers will look for suggestions about the teacher knowledge, roles, and practices that these city students believe are effective in helping them be successful in and to appreciate school.

#86

Hardware Implementation of Active Disturbance Rejection Controller for Vibrational Gyroscopes

David Avanesov, Anthony Roberts, and Harry Olar (Advisor: Lili Dong), Department of Electrical and Computer Engineering

Vibrational gyroscopes are rotation rate sensors with the advantages of low power consumption and low cost. They have been broadly used in automobile, consumer electronics, and inertial navigation. An Active Disturbance Rejection Controller (ADRC) has been designed for the gyroscope to compensate for mechanical imperfections, to measure an external rotation rate, and to improve the performance of the gyroscope. In order to testify the validity of the ADRC in real world situation, a hardware implementation of the controller has been successfully completed in the summer. This summer project has yielded the following direct products which open a door to a series of follow-up research opportunities and projects on other inertial sensors or actuators.

1) A successful implementation of the ADRC on a piezoelectrically driven beam gyroscope using analog circuits built on breadboards. It is the first time that the ADRC is implemented with pure analog circuits, which greatly reduces the cost of hardware.
2) A completion of first-generation Printed Circuit Board (PCB) to replace the breadboards.
3) An implementation of a LCD display of the rotation rate output from the gyroscope in real time.

#87

Cloning, Expression, Purification and Hydrogen production of CpI Hydrogenase from *Clostridium pasteurianum*

Rati Lama and Heidi Vielhaber (Advisor: Camelia Gogonea), Department of Chemistry

Hydrogenases play an important role in energy metabolism in anaerobic prokaryotes. Under anaerobic conditions, hydrogenases produce hydrogen gas. There are three types of hydrogenases: Ni-Fe, Fe-only, and metal free. The object of our study is the Fe-only hydrogenase, CpI from *Clostridium pasteurianum*. Using protein engineering to make mutations to the DNA, we allow the hydrogenase to produce hydrogen efficiently in the presence of oxygen. The catalytic activity of hydrogenase may be increase by substituting amino acids that are critical for oxygen diffusion to the enzyme active site (suggested by theoretical calculations). We cloned the CpI into the Pet22, and Pet28a plasmids which contain a His_6 tag coding sequence. For protein expression and purification of the CpI protein, we used gravity-flow chromatography. We also show how the HyndEF and HyndG proteins, acting as chaperones for the CpI hydrogenase, enhance the hydrogen production.

#88

Development of the Western Reserve

John Rios (Advisor: Robert Wheeler), Department of History

My paper is about the history of the Western Reserve. I decided on this topic because the collection that I have been cataloguing have been mainly collections of personal papers from the early western reserve, papers relating to the early history, and/ or the founding and beginnings of Ohio as a state. The thesis that I have at this moment is basically the conclusions that I have drawn from my research at this time. It is that the Western Reserve's initial development was slow, but after the ground was laid, it developed very fast, and that the region and it s development was affected by a variety of factors. The main points of my paper will involve various time periods in the area or various series of related events. The first bunch will include the early founding/ establishment of the Connecticut Western Reserve and its importance, the time of the first settlers, and all following development up until the late 19th century. The second bunch will include the establishment of various government services, the establishment and development of various towns, land deals, influence of major events, and other significant items. These were the major categories that the information I found in my research can be grouped into.

#89

INNOVATIVE STRATEGIC MARKETING, LLC: Expansion Possibilities into the United Kingdom

Aryn Kelly Ashworth, Jessica Buckosh, Katharine McLaughlan, Vedran Mijatovic (Advisor: Thomas Whipple), Department of Marketing

Innovative Strategic Marketing, LLC (ISM) is a professional product demonstration company based in Cleveland. The company features specialty houseware products that it demonstrates and sells at fairs, festivals, home and garden shows, in-store demonstrations, and other similar events. ISM has also branched into producing infomercial content.

The main focus of the research conducted in London was to learn consumer shopping and purchasing habits as well as to determine whether product demonstration at exhibitions and events is an accepted form of marketing in the London area. Communication with individuals at event venues and production companies, investigating retail locations, speaking with and surveying potential customers, and secondary research collected from the various libraries in London has resulted in a significant amount of information with which to provide ISM a sound entry recommendation into the London market. This expansion process developed will allow ISM begin gaining widespread exposure immediately upon entry to the London area market, and slowly increase that exposure in order to begin creating a brand awareness for the company.

#90

Scientific Racism: Evolution of Birth Control into Eugenics

Yolanda Nunez (Advisor: Robert Wheeler), Department of History

The use of contraceptives as a means for regulating birth is one which evolved into an attempt to keep the basic genetic stock from being corrupted. Originally, birth control did not concentrate on this idea of eugenics but the health of the mother; it also went on to emphasize their opportunity to pursue careers and higher education. This movement quickly shifted when feminists realized that the use of contraceptives would not solely lead to the equality of women, but what would become known as race suicide, a phrase referring to the declining birth rate of the high class and steady increase in the working class. In an attempt to solve this problem the feminists began to popularize the idea that poor people had a moral obligation to restrict the size of families because they created a drain on taxes and charity expenditures of the wealthy. It is at this time that eugenics and birth control became interrelated. Even though these events occurred in the past it is important to know what the true intentions of such organizations were in order to have a better understanding of the similar events taking place, such as that of the modern day "birth controller," abortion.

#91

Study of Brij Micelles Using Dynamic Light Scattering Spectroscopy

Karen Wilson and Mike Lekan (Advisor: Kiril A. Streletzky), Department of Physics

We studied properties of Brij-35 surfactant micelles in solution using Dynamic Light Scattering (DLS) Spectroscopy and the Optical Probe Diffusion method. Aqueous solutions of Brij-35 with concentrations ranging from 2 to 100g/L were made, both with and without polystyrene latex probes of diameters 24nm, 50nm, 282nm and 792nm. All solutions were analyzed at four temperatures from 10^{o} to 70^{o}C using DLS to obtain micelle and probe diffusion coefficients. Using both diffusion coefficients and assuming a simple hard sphere model for micelles we are able to deduce micelle radius (a_m), micelle water content (δ□, and number of surfactant molecules per micelle (N), as well as their dependence on factors such as temperature and concentration of surfactant. We found a_m increasing from 4.4 to 4.8nm, N increasing from 33 to 67 molecules per micelle, and δ decreasing from 4.5 to 2.4 g H_2O/g Brij-35 with solution temperature increase. We also observed that for the smallest probe size (24nm) the diffusion coefficient does not have the usual linear slope, possibly because the probes themselves are aggregating at low surfactant concentrations.

#92

Construction and Testing of New Setup for Dynamic Light Scattering Spectroscopy

Jessica Schwan (Advisor: Kiril A. Streletzky), Department of Physics

When light interacts with small particles in a solution, the phenomenon known as Rayleigh scattering occurs, in which the light is re-emitted by the particles in all directions. If the light source is a laser, which is monochromatic and coherent, this allows for the observation of time-dependent fluctuations in the intensity of the scattered light. These fluctuations are due to the occurrence of Brownian motion, which describes how the distances between molecules in a solution constantly change with time because the molecules are moving randomly. Dynamic Light Scattering (DLS) is a method for measuring and interpreting the intensity of the scattered light. In this method, the intensity-intensity correlation function is calculated, which can then be analyzed by the cumulant method, or the CONTIN algorithm, among others. These analyses give us information about particle size distribution, diffusion coefficient, and hydrodynamic radius. DLS is very advantageous because of the noninvasive, non-distractive, and reproducible nature of this method. Our goal was to design, build, and test a completely new independent setup for use with lasers of different wavelength and correlators of different resolution. After having assembled or constructed the major components, initial tests of the system (currently under way) will determine its effectiveness.

#93

Study of structure and dynamics of HPC Microgel nanoparticles - potential drug delivery system

Imaan Benmerzouga and John McKenna (Advisor: Kiril Streletzky), Department of Physics

Hydroxypropyl cellulose (HPC) is FDA approved polysaccharide with both water solubility and organic solubility depending upon temperature. HPC polymer chains can be chemically cross linked into stable nanoparticles called microgels. The HPC microgel properties vary based on polymer concentration, salt concentration and cross linking density. One of the most important properties of HPC is its critical temperature of 41ºC, at which the polymer undergoes a reversible phase transition. HPC microgels can also undergo a reversible volume phase transition in which particles shrink on average by a factor of eight. This property might lead to effective application of microgels as effective targeted drug delivery and release system.

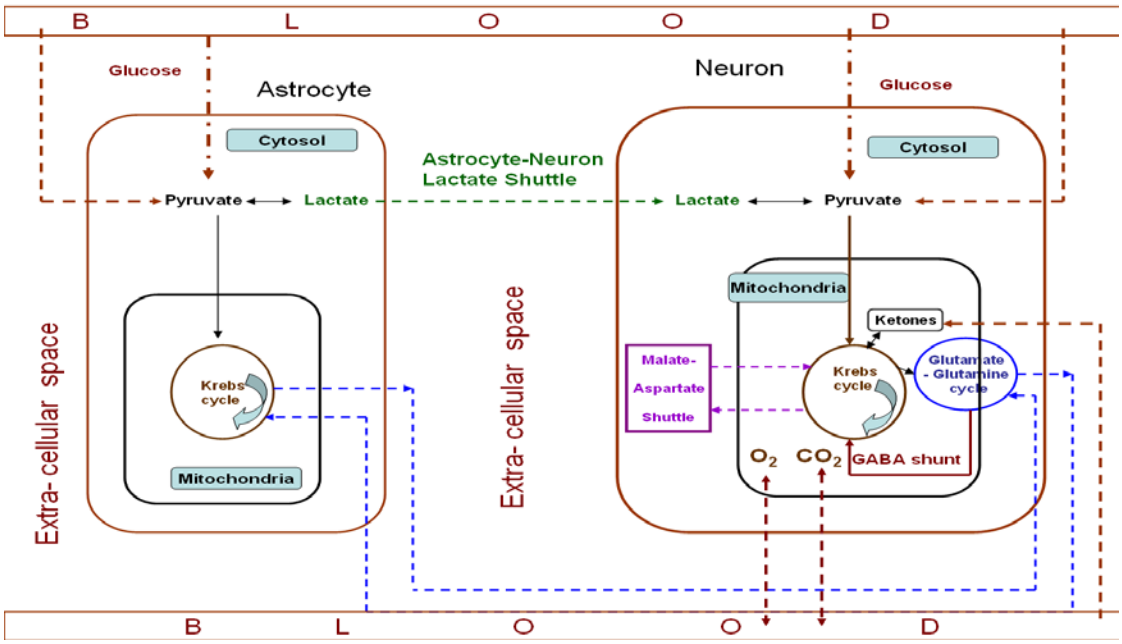
We use dynamic light scattering to study microgels at thermal equilibrium and apply line shape analysis algorithm to analyze the resulting spectrum. We studied different HPC microgel solutions and found that the microgel initial size depends heavily upon polymer concentration compared to the other variables. We also found that varying the salt concentration affects the dynamics of the microgels. In addition, we were able to determine the effective cross linking density that yields relatively monodisperse microgels. We explored the structure of several microgel solutions by angular dependence analysis and found that most of them were spherical particles. In addition, we explored the dynamics of the same microgels by temperature dependence analysis that enabled us to monitor the shrinking behavior of each microgel.

#94

Synthesis of Metabolic Pathways using Thermodynamic Constraints

Frank Marealle (Advisor: Jorge E. Gatica), Department of Chemical and Biomedical Engineering

In order to understand quantitatively how metabolic processes work, a mechanistic model is often formulated through biochemical mass balances and reaction kinetics. The modeling of a recognized, although not fully characterized yet, metabolic pathway is selected as an illustrative case study for this project: the astrocyte-neuron lactate shuttle in mammalian brain metabolism. Due to the difficulty in physically obtaining reaction rate constants for individual biochemical reactions, flux balances are often employed to reduce the number of unknown parameters. Although flux balances can be valuable predictive tools, their use with the inclusion of proper thermodynamic constraints in pathway analysis can be used to more reliably estimate biochemical reaction rate parameters, and yield a robust dynamic model. The integration of these principles within a parameter estimation methodology will be developed in this project.



#95

Robotic Swarms Sensors

Christopher Churavy (Advisor: Dan Simon), Electrical and Computer Engineering Department

Various sensors are available on the market for use in robotics applications. The robotic swarms project makes use of several different types of sensors, each of which plays an integral role in the operation of the robots. Wheel encoders, one mounted on each motor casing, two per robot, provide the robots with a sense of position, resulting in the ability to effectively control the robots' movements and send positional data to the base station's mapping algorithm. Accuracy in controlling the robots' turns is achieved through the implementation of an angular rate sensor mounted at each robot's center of rotation. Visual data is acquired by wireless cameras mounted atop each robot. The cameras transmit information to the base computer where images can be retrieved. An explanation of the operation of each device is outlined on the poster.

#96

Preference and Perception of Coaching Behaviors by NCAA Male and Female Athletes

Angela Cunningham (Advisor: Eddie T. C. Lam), HPERD

Coaching behavior has long been recognized as an important element that affects the performance of athletes. Previous research on leadership has concentrated on coaching in general (e.g., Sabock, 1979), coaches' behaviors (e.g., Chelladurai and Carron, 1981), or coaches' style of decision making (e.g., Chelladurai, Haggerty, & Baxter, 1989). Few studies have focused on female athletes or gender issues. The purpose of this study was to examine the preferred and perceived coaching behaviors between male and female athletes. Student-athletes (N = 1,059) completed the 60-item Revised Leadership Scale for Sports (RLSS; Zhang, Jenson, & Mann, 1997). The male athletes (N = 596) were from the following sports: baseball, basketball, soccer, tennis, and track and field; while the female athletes (N = 472) were from softball, basketball, soccer, tennis, and track and field. SPSS 11.5 for Windows (SPSS, 2004) was used for data analysis. Results of the MANOVA analysis indicated that there were significant (Wilk's Lambda = 10.87, $p < 0.001$) gender differences in the preference and perception mean vector scores. Post hoc analyses indicated that female athletes preferred a lower degree of autocratic behavior than male athletes. In addition, female athletes perceived their coaches had a lower degree of democratic behavior and autocratic behavior than their male counterparts. It is suggested that coaches should use different coaching styles for male and female athletes.

#97

Perception of Service Quality by Recreation Center Members and its Relationship with Demographic Variables

Christopher Kaul (Advisor: Eddie T. C. Lam), HPERD

Service quality is one of the many major elements that affects the long-term profitability of an organization (McDonald & Howland, 1998; Zeithaml, Berry, & Parasuraman, 1996). For this reason, an on-going process to evaluate service quality is necessary. The purpose of this study was to examine the service quality of a recreation center in Ohio using the modification version (SQAS-RC) of the Service Quality Assessment Scale (Lam, Zhang, & Jensen, 2005). Participants (N = 161) were male and female recreation center members. Results of one-sample t-tests indicated that the mean perception scores for all items of the SQAS-RC were significant ($p < 0.05$) different from the median score, indicating that the recreation center provided outstanding service to the members. When examining the various demographic variables, no significant ($p > 0.05$) mean differences were found in Staff, Program, Locker Room, Fitness Facility, Aquatic Facility, Child Care, and Overall Facility among different membership type, year as a member, gender, age, use frequency, area use, education, and profession. However, there were significant ($p < 0.05$) mean differences in Locker Room, Fitness Facility, Aquatic Facility, and Child Care service quality among members who visited the recreation center in different times of the day. It is suggested that the recreation center should concentrate their resources in serving members during those peak hours, particularly between 6:00 to 10:00 pm.

#98

A Comparison of Preferred and Perceived Coaching Leadership Styles Between Team and Individual Sports

Mark Strozewski (Advisor: Eddie T. C. Lam), HPERD

Attempts were made by researchers to examine coaching leadership behaviors in various sports including basketball (e.g., Chelladurai, 1985), baseball (e.g., De Marco, 1997), wrestling (e.g., Dwyer, 1990), softball (e.g., Gardner, 1996), volleyball (e.g., Hastie, 1993), and football (e.g., Maby, 1997). Very few, if any, studies have compared the preferred and perceived coaching styles between team and individual sports. The purpose of this study was to examine the preferred and perceived coaching behaviors between team and individual sports using the 60-item Revised Leadership Scale for Sports (RLSS; Zhang, Jenson, & Mann, 1997). Participants of this study were male and female athletes involved in team (N = 1,103) and individual (N = 402) sports. Team sports included baseball, football, basketball, soccer, softball, and volleyball; while individual sports included cross-country, golf, tennis, track and field, wrestling, and swimming. Results of the MANOVA analysis indicated that there were significant (Wilk's Lambda = 8.76, $p < 0.001$) differences in the perception and preference mean vector scores for all six subscales of the RLSS. When compared to their team sport counterparts, individual sport athletes preferred a higher degree of Democratic Behavior, Positive Feedback, Teaching and Instruction, Situational Consideration, and Social Support, but a lower degree of Autocratic Behavior. Meanwhile, individual sport athletes perceived their coaches to have higher Democratic Behavior, Positive Feedback, and Situational Consideration than team sport athletes.

#99

Women Substance Abusers and Eating Disorders

Alicia Romano (Advisor: Dana Hubbard), Department of Sociology

Much of the literature on the relationships between substance abuse and eating disorders has studied clinical samples (Jordan et. al, 2002; Measelle et. al, 2006), eating disorder treatment seeking women (Herzog et. al, 2006; Deep et. al, 1997; Casper, 1998), and non-clinical, community based samples including; university samples (Piran & Robinson, 2006; Leon et. al, 1985), adolescent Latinas (Hodson et. al, 2006), and general-population studies (Piran & Gadalla, 2007; Ranson et. al, 2001,). With the exception of Ross-Durow and Boyd (1999) who studied African American women who smoke cocaine, and William et. al. (2003) who studied "Methylphenidate and Dextroamphetamine Abuse in Substance Abusing Adolescents," very little is known about substance abuse and eating disorders in a population of women with substance abuse disorders (SUD). The "war on drugs" institution of mandatory sentencing and new technology for drug testing has put considerable amounts of non-violent women offenders into the U.S. prison system (Chesney-Lind, 2003). With this increase of women entering prison for drug related crimes a sample of women convicted of drug related offenses is needed. Therefore, due to the unique experiences of women, in a culture that glorifies thin women, it is hypothesized that women who have low body satisfaction often use drugs and eating disorders as a way to control and escape their environments.

#100

Robotic Swarm Project - The Chassis

Nina Scheidegger and Maria Baker (Advisor: Dan Simon), Electrical and Computer Engineering Department

No matter how high tech and advanced all the parts on a car may be, the car will not run if it is not designed in a way that will allow all the parts to function correctly. The same idea applies to a robot. A robot will not work properly unless all the individual devices on the robot are put together correctly along with the others. Each robot component has certain needs in order for it to work correctly. A robot had to be created that would satisfy each components individual needs. Fundamentals of statics and dynamics were utilized to calculate different forces from several devices to keep the robot assembly in equilibrium. After assessing all these things a reliable robot chassis was created. From this design a swarm of robots was effectively created for our research.

#101

Robotic Swarms

Maria Baker and Nina Scheidegger (Advisor: Dan Simon), Electrical and Computer Engineering Department

The goal of the robotic swarm is to roam through a building with an unknown layout and construct a map of the building. The robots will be equipped with various sensors and devices to accomplish this task. Using radio communication, the robots will send information back to a base station where the map will be constructed. Being able to use robotic swarms effectively shows a promising outlook for the future. Robotic swarms can aid humans in many dangerous situations and make great strides in the exploration of uncharted territory.

#102

Strategic Marketing Business Plan; Feasibility Assessment on Increasing Music Sales in the London Metropolitan Market

Robert Gray, Randa Asfour, and Tiffany Ponds-Kimbro (Advisor: Thomas Whipple), Department of Marketing

The Cleveland Orchestra is a long standing, world renown, respected part of the Cleveland fine arts community. While it has enjoyed popularity for its live performances, sales for the orchestra's CDs have not had the same level of success. Many never knew that CDs existed for sale at all. With that in mind, research was begun on how to market those CDs in England, particularly London. By doing surveys on the general public, in specific points of interest, information began to be compiled on the listening habits and purchases of classical music by consumers in London. There was also research gathered on classical music purchases in comparison to other genres by different demographic groups. The data was used to discover if the Cleveland Orchestra would be able to market their product overseas.

#103

Mass Media Comedy, Audience Behaviors, and Contextual Cues: The Effects of a Laugh Track

Rachel Campbell, Dan Griffith, Serena Hendricks, Jennifer Overstreet, Angie Sciulli, and Jia Wang (Advisor: Kim Neuendorf), School of Communication

An experiment was conducted manipulating the presence or absence of a laugh track in four episodes of the *Andy Griffith Show*. Subjects were randomly assigned to one of the eight conditions. Subjects viewed in small groups of 2-5. They were videorecorded as they watched, for later coding of their behavioral responses.

A pre-experiment questionnaire measured a variety of constructs relevant to a model of humor appreciation and mirth behavior. A posttest questionnaire measured cognitive and affective responses to the episode. A total of 114 subjects in 29 groups participated.

There is evidence of some interactions between humor type preferences and humor types "found" on ratings of funniness of the content. Surprisingly, manipulation checks indicated that 86% of the laugh track and only 61% of the no-laugh track condition answered correctly when asked whether there was a laugh track present. The effect of the laugh track on perceived funniness mixed—a positive impact for three episodes and negative for one.

Future analyses include the assessment of coded mirth behaviors (i.e., smiling and laughing), and other negative and positive behavioral outcomes. A 22-variable coding scheme, based on past research and pilot work, is being used by trained coders to analyze the videorecordings.

#104

Family Readiness Groups: A Coping Resource or a Source of Stress?

Kaitlyn Berry (Advisor: Katheryn C. Maguire), School of Communication

A wartime deployment is a particularly stressful time period for families with loved ones in the military. The U.S. Army created Family Readiness Groups (FRG) to enhance communication between deployed soldiers and their spouses as well as provide a dependable social network with a common goal to support and enhance family stability. Instead of a source of support, however, FRGs can be a source of stress for some Army wives. It is therefore important to identify and categorize the varied experiences of Army wives with the FRG to understand the difference between a beneficial versus detrimental relationships with an FRG. Interview transcripts of ten women whose husbands were deployed to either Iraq or Afghanistan between 2003 and 2005 were examined to determine the extent to which FRGs were helpful, or harmful, to their emotional and/or relational well-being. Preliminary results indicate that for many of the women, the FRG was an additional form of stress to endure, depending upon the degree of involvement between the FRG and the spouse. With this information, officials in charge of FRG programs can better optimize its function as a support network of support and consequently, easing the hardship of deployment for all parties involved.

#105

Simulation and Control of a Linear Positioning Stage

Matt Milliren (Advisor: Hanz Richter), Department of Mechanical Engineering

A linear positioning stage and controller was recently purchased from Parker Bayside (a subsidiary of Parker Hannifin). The system is set up in the Mechatronics Laboratory (SH 25).

A controller (iDrive) is used to command the positioner. The iDrive controller comes with accompanying computer software. This software sets limits and parameters to protect the controller and positioner. Additionally, this software is used for transmitting signals to the controller which in turns operates the positioner. The software and the controller must work in unison for proper operation of the positioner. Unfortunately, the user interface for the software is not very intuitive. Additionally, due to aforementioned software set limits and parameters, the positioner is restricted in potential applications. Our goal, through research and use of modeling and control theory, is to find a way to bypass the software and iDrive controller. Ultimately, we would like to have our own program/controller so that we may operate the positioner freely, replacing the built-in control algorithm by our own designs. If successful, the positioner will be able to be used for many control demonstrations, including the inverted pendulum, liquid slosh control and active suspension systems.

#106

Good Intentions: The Role of Cleveland In The Eugenics Movement

Brianna Huth (Advisor: Robert Wheeler), Department of History

Eugenics is a social philosophy which advocates the improvement of human hereditary traits through various forms of intervention. The goals of various groups advocating eugenics have been to create healthier, more intelligent people, to save society's resources, and lessen human suffering. For the sake of this research project, the term *eugenics* is used to refer to movements and social policies that were influential during the early 20th century. The purpose of this project was to draw a connection between the city of Cleveland and these movements that were taking place all over the country. The project also explores the contributions made by some of Cleveland's major organizations to the cause of "bettering the human race." Some of the contributing Cleveland organizations included The Brush Foundation, Cleveland Chamber of Commerce, and Planned Parenthood of Greater Cleveland.

Some posters may not be represented in this abstract booklet because their abstracts were submitted after booklet printing. We appreciate the efforts of all poster presenters, their co-workers, and their advisors.