UGRC Program 2007
POSTER SESSION

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**Michael A. Bowe**  
*Exercise and Sports Science*

Comparison of Factors Affecting Fat Utilization in Sedentary Males

There are various factors that affect the way that the body oxidizes (utilizes) fat. We have isolated some of the possible factors and are analyzing data now to see of the factors which has the most correlation to the way that fat is oxidized, and to see what affects that training might have on these factors.

**Tyler Halford**  
*Psychology*

A Meta-analysis of Four Pre-marital Variables that Affect Marriage Satisfaction

I propose to carry out a meta-analysis of several studies addressing four variables that impact marital satisfaction. While many variables have an effect on marital satisfaction, I will focus on variables present before marriage. The four variables to be analyzed will be as follows: personality, religion, age at time of marriage, and cohabitation.

**Stefanie Roemer**  
*Geology*

Preliminary Bedrock Geologic Map of the Scott Butte Quadrangle, Clark County, Idaho

The bedrock geologic map of the Scott Butte quadrangle is a compilation of field work preformed by students attending the Advanced Field Geology course at Brigham Young University-Idaho in 2006 supplemented with unpublished research done by Skipp (1985) and Embree et al, (1981?). Preliminary work was preformed on aerial photographs to locate and identify stratigraphic contacts, faults and other structures then transferred to topographic base maps. Field checks have not yet been preformed in the northern portion of the map where there are major structural problems that still need to be resolved. Alluvial deposits are undifferentiated and have been mapped as a single unit due to this maps emphasis on bedrock geology. Strata in the map area have been transported eastward as a result of Sevier thrusting which led to complex folding of Paleozoic strata. Sevier structures have been dissected by Basin and Range normal faults and other minor faults. Tertiary volcanic units have been physically correlated and efforts are under way to obtain radiometric ages. This map is part of an ongoing project by Brigham Young University-Idaho to produce detailed geologic maps of the Beaverhead Mountain Range and to eventually correlate Sevier structures across the Snake River Plain to the Big Hole Mountains.
**John Mayhew**  
*Geology*

Digital Strain Analysis of Syntectonic Granite Intrusions in the Norumbega Shear Zone, Inner Casco Bay, ME

A digital strain analysis was conducted on deformed granite intrusions within the Cushing Formation on islands of inner Casco Bay, Maine. RTK (+/- 1 cm) GPS units were used to map the granite intrusions and GeoXT (+/- 50 cm) digital GPS units were used to gather the structural orientations. These structural orientations were plotted on stereonet diagrams to show a regional trend of 212° plunging 22°. Strike and dip have a 046°, 57° average orientation. Right-lateral shearing resulted in clock-wise rotation following the assumption that the original intrusions had an emplacement that was orthogonal to the foliation. The strain analysis was conducted by using a surface area reconstruction model which assumes a simple shear mode of strain. Beta angles where calculated and their corresponding gamma values were used to approximate the magnitude of displacement.

**Jennifer McCullough**  
*Geology*

Harvester Ants

Red harvester ants (*Pogonomyrmex barbatus*) are herbivores, their diet consists mostly of seeds from various grasses. As they “harvest” the land surrounding each nest, they clear it of almost all living material. These denuded areas can be over 1.5 meters in diameter and are visible on aerial photos. 15 random 1 hectare quadrangles were measured on an aerial photo. Any nests within or touching these quadrangles were counted averaging 9.87 nests per hectare. The average distance between nests was 54 meters.

While conducting this study it was discovered that the nests lacked a uniform distribution. Instead nests had a linear distribution which followed the drainage systems. The nests tend to be on the north side of the gullies slightly above the bottom. These south facing slopes receive more sunlight during the year and thus may have warmer soil temperatures and/or higher vegetative production. Further studies will be preformed this summer to confirm this hypothesis.
UGRC Program 2007

CONCURRENT PAPER SESSIONS

COMPUTER INFORMATION TECHNOLOGY

### Room 120

**10:00 AM**

**Joey Conway**  
*Computer Information Technology*

**Legislation’s Impact on Information Technology**

My research paper is going to deal with legislation and Information Technology frameworks that affect the Information Technology industry. I will mainly discuss Sarbanes Oxley, Foreign Corrupt Practice Act, Gramm-Leach-Bliley, HIPAA, and Family Education Rights and Privacy Act. All these different legislations affect their respective industries and impose information technology requirements and constraints that weren’t previously in existence very many years ago. The requirements set forth in these pieces of legislation are at times difficult and confusing to not only understand but implement. The common understandings from these pieces of legislation will be discussed along with their implementations and impacts on their respective industries. The advantages and disadvantages will also be discussed.

**10:15 AM**

**Mike White**  
*Computer Information Technology*

**Security Policy in Small Business**

Although accepting risks and dealing with consequences may seem a better option, small businesses can and should create a security policy because it helps the company to organize and prepare for possible future incidents. In writing security policy for a small business, it is important to first consider the risks involved. There are many risks to running a business, especially if much of its functions are on the web. After deciding which risks are worth addressing, an acceptable use policy should be written to decrease liability. It is also important to educate the employees about the policy to effectively utilize its benefit. Implementing security policy in a small business may be difficult, but it will pay off in the long run.

**10:30 AM**

**Clint Moses**  
*Computer Information Technology*

**Content Filtering**

In this study the importance of content filtering in computer systems is addressed and methods of filtering are discussed. With newly developing technologies emerging often, there is an increasing need to filter content. Filtering allows for protection from sexual predators, malicious software, identity theft, inappropriate material and web based scams. Several methods are in place that provide content filtering such as DNS Poisoning, Blackhole Routing, Proxy Filtering and Content Scanning. Though these methods aren't flawless they provide a great deal of protection for systems, as they do not often protect themselves. There are many content filtering applications that provide home protection as well as commercial and business protection. In order to prevent potential problems individuals need to be aware of threats and possible solutions to these threats and the purpose of this study is to inform individuals of those threats and solutions.
Implementing Wireless Network in Higher Educational Institutions

Blake Grover

This paper addresses the problems and benefits with using wireless technology in higher education institutions. Wireless networks have become more popular and are everywhere and very helpful to students attending institutions. But wireless networks also have had major problems with security and making sure those who should not have access don't have access to the wireless network. This paper also addresses how these institutions are implementing, securing, and using wireless networks and what are the best practices.

Honeypots and Honeynets; Tools for Network Security

Timothy Nielsen

Computers have been beneficial but have also shown weaknesses in protecting information contained in them. Often, security measures are of a defensive nature by giving the image of an impenetrable fortress. Companies are now reaching towards a more offensive approach by responding to attacks with programs that will trace the attackers or even contain them to lead to prosecution. The latest software of this nature is called a honeypot. The honeypot works as a lure to attackers. The honeypot contains false information that gives the illusion of actual information. Therefore, a honeypot network can be a viable weapon in an ever increasing need of security.

Social Engineering

Jeremy Hart

Imagine if you were able to talk to somebody for 5 minutes and get any piece of information that you wanted. What if in those 5 minutes you gave away valuable information that you didn’t think was important? It happens everyday around the world. Social Engineering is a non-technical form of intrusion that relies on human interaction in order to break normal security measures. Social Engineering comes in all forms from phishing to pretexting to trojan horses. Due to the effectiveness of this technique many laws and documents have been put into place to prevent this from happening. It has even raised awareness while in the workplace. The truth is talking to somebody is a lot easier than brute force.

Rootkits

Christopher Robinson

Threats like rootkits are an example of how as technology advances so does the way people can use it for causing havoc. Rootkits are built to hide items like files and registry entries from the user of a computer which makes them potentially very destructive and dangerous. Actually rootkits have been around for awhile in different forms but have caught mass media attention recently in a piracy thwarting attempt by Sony BMG. So how can we detect these rootkits and eliminate them from our computers? How can protect ourselves from future issues? These are some of the questions I will attempt to answer.
The molecular composition of the human body has provided a defense against intrusions from foreign substances for thousands of years. In today’s world of insecurity, high tech protection is desired and needed, especially in area of computer security. There many similarities between computer security and molecular biology. Many normal human functions we take for granted, such as cell structure or your own immune system can easily relate to the field of computer security. This paper will explore these similarities and it will also explore how biology currently is helping to develop and spur innovation in the area of computer security.
Stuart Mahoney  

Caught in Traffic: A Study of Congestion Comparing the Largest and Smallest Metropolitan Areas in the United States

This research paper investigates the factors which cause congestion and increased commute times in sixty cities and their surrounding metropolitan areas throughout the United States. Specifically it examines the thirty largest and smallest metropolitan areas according to population and examines them in terms of population density, incomes per household, total population, and local transportation spending and how these factors affect the average commute times of the people in the different metropolitan areas.

The study finds that in both large and small metropolitan areas commute time is increased when there is more population density and total population. It also finds that commute times generally decrease when more government money is spent on transportation. The most significant finding concerns how incomes per household relate to the mean commute time in a metropolitan area. It was shown that in the small metropolitan areas an increase in per household income led to a decrease in the mean commute time, whereas in the large metropolitan areas an increase in per household income leads to an increase in the mean commute times. Some of the implications of these findings are discussed as well.

Kristen Meisberger  

Desperate to Cope: Self-injury among Adolescents

While drug and alcohol use remain in the limelight of addictions, many individuals fail to recognize the reality of another addiction afflicting teenagers and young adults; self-injury. Although self-injury (SI) serves the same general purposes as the previously mentioned addictions, it remains a little-talked about problem because of the social stigma surrounding it. The question of why people choose to intentionally inflict harm on themselves is difficult for most people to confront. Nevertheless, little progress can be made towards treating the problem unless community and academic institutions have a better understanding of what self-injury is; those most at risk; the role of psychological influences; how to build a support system; and the current treatment strategies.
### Speaker Design and Construction

Using only basic laboratory materials such as an old pizza box and a roll of duct tape, my colleagues and I designed and constructed a working dynamic loudspeaker. The design was simple and somewhat crude but produced high quality sound nonetheless. When an alternating current is passed through the speaker's voice coil in the presence of a magnetic field, the speaker vibrates at frequencies ranging from less than 100 Hz to more than 1000 Hz. These vibrations cause compression waves in the surrounding air which are interpreted as sound in our ears. Initially we failed to produce any measurable sound, but we re-designed the speaker and persisted. Our success came only when we realized the need to significantly amplify the input signal.

### Why is Physics Hard?

The phrase “physics is hard” is common enough to cause educators some concern. Why do students find physics to be hard? There is a theoretical basis in Piaget’s work for the notion that people at earlier stages of cognitive development have a harder time with highly conceptual disciplines like physics. Some research has been done by Coletta and Phillips as to whether students' level of cognitive development influences their performance on the FCI (Force Concept Inventory). To identify a student’s reasoning level, they used the Lawson Classroom Test of Scientific Reasoning which includes questions on conservation, proportional thinking, identification of variables, probabilistic thinking, and hypothetico-deductive reasoning. Our research also uses the Lawson test and FCI in hopes of finding some correlation between reasoning ability and FCI performance that might provide insight into why so many students think physics is hard and also might provide justification for innovation in current approaches to physics education.

### Wind Energy

Wind energy is an exciting energy source that is quickly on the rise. With this growth there is an increasing need for understanding and technological development within the wind industry. Of particular importance to commercial operators is the need for forecasting. This paper investigates the possibilities of forecasting based upon data from a wind anemometer. Specifically, there are four areas of investigation. First, a spectral analysis is performed through use of a fast Fourier transform. A logarithmic plot of power versus frequency reveals a near Brownian trend. This trend changes to white noise at a frequency of 1/(24 hours), suggesting a diurnal cycle. This diurnal cycle is verified by averaging the wind speed for each time of day over the course of six months. Second, an autocorrelation function is applied to the data. The results suggest strong persistence at low ranges and weak persistence over large ranges. Third, it is shown that the frequency of occurrence distribution resembles a Weibull distribution. Fourth, the frequency distribution is approximated as a Gaussian curve, and a synthetic signal is created. Visual inspection reveals that this signal appears to be a good first order approximation to an actual time series. The previously mentioned results suggest that there is a daily cycle in the wind pattern. Forecasting over short ranges may be possible. However, it will be difficult to forecast over 24 hours into the future using the methods employed in this paper.