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WISCONSIN ENGINEER

VOLUME 101, NUMBER 2 FEBRUARY 1997

INSIDE THIS ISSUE

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On the Cover: An astronaut explores the moon's surface and collects samples for studies on Earth. Photo from Professor Kulcinski.

Published by the Students of the University of Wisconsin-Madison

FEATURES

DEPARTMENTS

Faculty Advisor: Steve Zwickel
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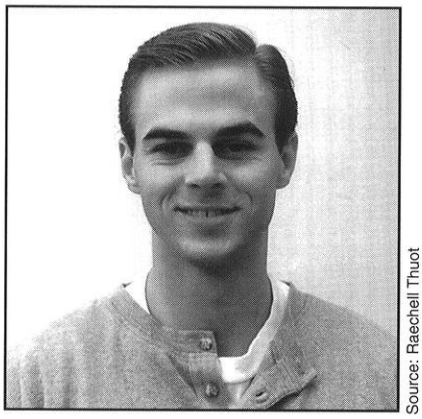


Source: Raechell Thuot

My Editorial - a.k.a. True Story by: Me

Editor-in-Chief: Jon Furniss

Saturday 12/7/96: 10:52 pm - Computer Lab at Mechanical Engineering Building

Well, I've been told that when you don't know what to write you should just write what your feeling and see what happens. So I guess that's what I'll do. I'll write what I'm feeling and maybe we'll get an editorial out of it.

Right now I'm tired and frazzled. I've been in the same computer lab for about ten hours. It's Saturday and the final report in my senior design class is due Monday (at 3:30 to be specific). My group and I have to do a major presentation and hand in the final written report. We have a lot done, but as with any design, it seems as though we're never done. I suppose at some time we'll just have to say forget it and settle for whatever we have done at the time. At this point I don't mind. I think that may be the best.

I guess I just don't understand why we have to do all this junk. We have tons of ACAD drawings and calculations. Why do we have to write this formal report with a big presentation? No one will really care that much anyway. I'm not happy. Oh well, I suppose I should get back to it.

Sunday 12/8/96: 12:00 pm - Computer Lab at General Engineering Building

A new day, I guess I should get to work on my project, but I think I'll spend a few minutes on this first. Maybe it's just because I only got here a few minutes ago, but I feel a little better today than I did last night. Maybe this won't be too bad and we'll finish it up pretty soon. I'll miss the Packer game, but at least I'll be done. Don't laugh, it might happen.

Sunday 12/8/96: 6:12 pm - Still at the Computer Lab at General Engineering

Scratch what I said before, that wasn't me talking. We've been here about six hours and I fear that there's no end in sight. I vaguely remember what it was like to actually have a life. Really, it wasn't that long ago. Really. You know, just once I'd like to see my group members in a setting other than a computer lab. On that note, we are about to leave which I think is a good thing. Unfortunately, we're only going to this guy's work so that we can use his big printer and copier. We'll have fun now — right.

Monday 12/9/96: 1:04 am - Nameless Guy's Place of Employment

Thank God for Kinko's. What would students do without 24 hour copy shops. Me and another guy just got back from the copy shop. We dropped a little over 40 dollars so that everyone in the group could have a copy of this magnificent piece or work (yes this is sarcasm). I guess it's a small price to pay if it means the end's in sight. I think I can see the light at the end of the tunnel. I had better run, I think they're getting upset with me because I keep writing this.

Monday 12/9/96: 5:45 am - Still at Nameless Guy's Place of Employment

Just shoot me now — please. Boy, was I ever wrong about that light. When we got there it was a lighted arrow (like those at construction sites) telling us we were going the wrong way. Actually, we're almost done (I think). We just have to practice the presentation a couple more time. It's a PowerPoint presentation and we have ProEngineer drawings and even a computer animation. I hope it was worth it. I just want to sleep.

Monday 12/9/96: 2:30 pm - Lobby at Mechanical Engineering Building

Almost time. I'm a little nervous, but I don't know why. Like I said the other day — who really cares about this anyway? I guess I never thought about it much, but I care. We did a lot of work this semester and this is our chance to show it. We took an idea all the way from the conception to the final design. I never thought I'd be able to do anything like that. I guess I really did learn something here. Of course, I suppose that will be proved one way or the other by the presentation. Wish us luck.

Monday 12/9/96: 6:00 pm - Computer Lab at Mechanical Engineering Building

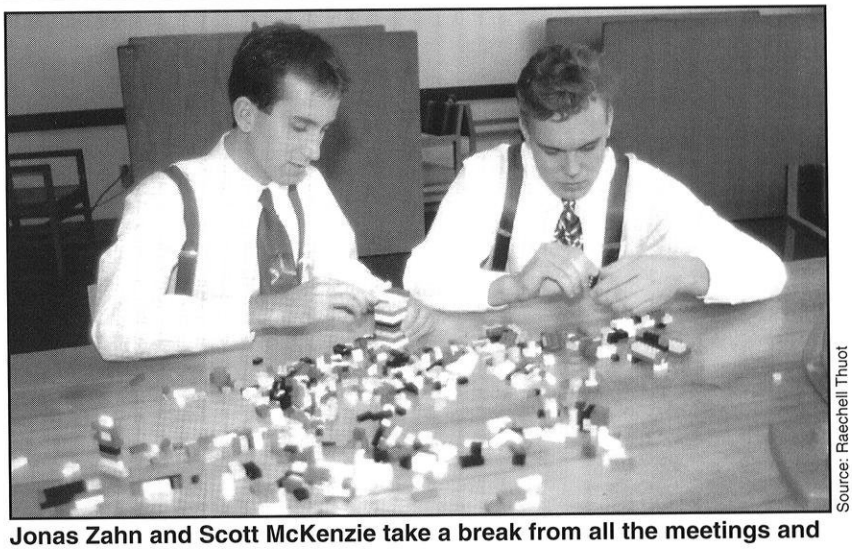
Finished!! I'm back where I started writing this, but this time I'm finished. I have to tell you, that went well. Everyone was really impressed — including myself. I didn't really think about how much effort we put into that. I'm pretty proud of the work we did. I guess I thought it was a lot at the time, and I did a lot of complaining, but in the end it was worth it. I think it was some of the best work I've ever done. I guess that whole thing was pretty fun. I'm going to miss my group — they were good guys. I'm going to miss this place. It was pretty hard and I complained a lot while I was here, but I'm proud of having gone here and to have earned an engineering degree. I think it was all worth it.

-Jon Furniss

The People Behind Expo 1997

Sara Vail

This is an Expo year as a result Chuck Hwang and Jonas Zahn are practically living in that decrepit shack on the corner of University and Breese, huddled in their little office talking, planning and fighting their way toward complete organization. Chuck and Jonas are the executive co-chairs for Engineering Expo 1997 which means that they have excessive claims on their so-called "free-time." But before you hear all about Chuck and Jonas, here's a review on what Expo is.



Source: Raechell Thuot

Jonas Zahn and Scott McKenzie take a break from all the meetings and stress of EXPO to build with legos.

The definition found on their web page (www.cae. wisc.edu/~expo) is the following:
"Expo is a biennial student organized exhibition whose purpose is to acquaint the public with recent technological advances developed in the College of Engineering and throughout industry."

The first Expo was organized as the result of a riot in 1938 to focus the students' energy. The riot was between the engineering students and the law students over the correct classification of Saint Patrick. Each group believed that Saint Patrick was a master of their respective programs. It is unclear as to whether or not this mystery has been resolved, but Expo has continued to thrive ever since. Expo 1995 boasted international attendance of over seventy industrial and student exhibits as well as fourteen thousand additional visitors.

The first Expo was organized as the result of a riot in 1938 to focus the students' energy

The large attention grabber for Expo 1997 will be the Robot Triathlon which is scheduled to be held in the Fieldhouse. There will also be industrial exhibits, graduate and undergraduate student exhibits, various student organization exhibits and high school, middle school and elementary school involvement. The purpose of this huge technology fair is to expose as many people as possible to the progress being made in industry due to technological advancements. Another major goal is to spark or encourage the growth of an interest in engineering as an exciting, ever-changing and challenging field of study to eventually build a career in. If this is of interest to you, and you would like to play a part in this year's Expo they are always thrilled to have more volunteers. To get involved just contact the people who make this all happen.

Chuck Hwang is a native of Taiwan who came to Madison at the age of three. He spent most of his life in Minnesota and returned to Madison to attend college where he is majoring in Chemical Engineering. He can be reached at his email adress which is hwangc@caelab1.cae.wisc.edu, and Jonas Zahn can be reached by email at zahn@caelab1.cae.wisc.edu. Jonas is from Juneau, a small town in Wisconsin. His decision to attend college at all was influenced when he attended Expo 1993 as a senior in high school. He is now here at Madison majoring in Civil and Environmental Engineering. Jonas wants to pass the influence Expo had on his life to other potential college students.

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Supercomputing for Students

Jim Feldman

If you want to see what the Computer Aided Engineering (CAE) computer labs will look like in five years, take a look at the Model Advanced Facility (MAF) lab, located in 187 CAE. The principal function of the MAF (founded in the spring of 1994) is to preview new hardware and software for the College of Engineering, in advance of COE's four year replacement cycle. This means that as new and advanced computer equipment becomes available, the MAF tries to obtain samples. Almost all of this equipment is obtained through grants, loans or gifts.

The MAF concentrates its efforts in areas growing quickly in capability and interest. It is currently concentrating its efforts in the areas of engineering animation, data visualization, and parallel/distributed computing. Faculty and students (both graduate and undergraduate) with a project or interest in these areas can use the equipment and consulting facilities at the MAF.

The MAF's Hardware

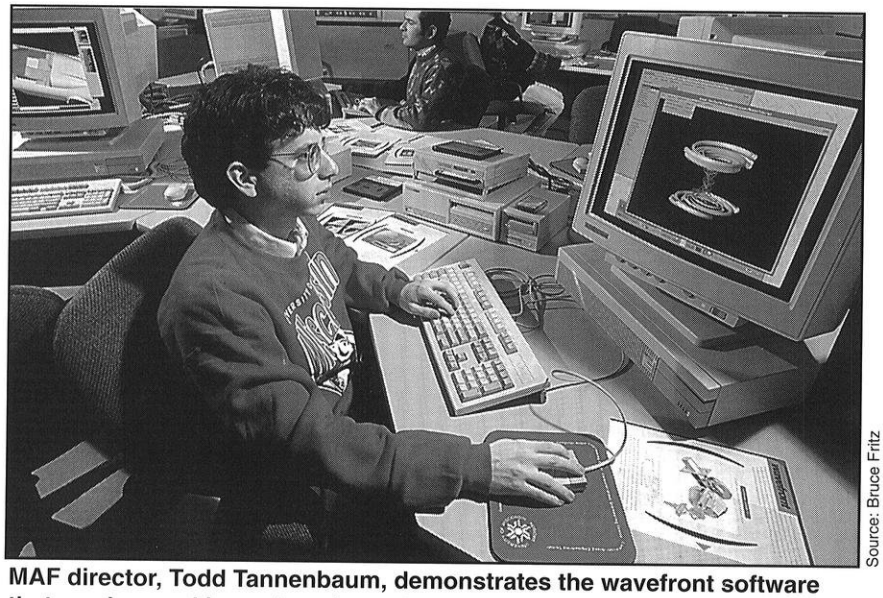
As you would expect from a lab specializing in modelling and visualization, the hardware at the MAF is remarkable. The centerpiece is the IBM SP-2 supercomputer, with 16 parallel computing nodes, each with a one gigabyte hard disk and 128 megabytes of RAM. This means, as the staff puts it, that, "This machine has more RAM than a big home machine has hard drive space." The SP-2 generally runs Fortran, Pascal or C programs, submitted as batch jobs. It is not possible to work interactively on the SP-2. The hardware workhorses of the MAF are Hewlett Packard workstations. There are seven HP735/99ís. There are also other larger HP's and several Silicon Graphics machines.

Of particular interest is the Condor system, which links several hundred in CAE and across campus. A batch job submitted to Condor is run on whatever workstations are unused. If a workstation becomes occupied during the Condor job, Condor switches the job to the next available workstation, without loss of CPU cycles. Because Condor runs jobs during off-peak hours, it is possible to obtain the use of years of CPU time in a single semester.

The MAF's Software

The software available at the MAF is some of the newest and most capable available. The software used for animation is Wavefront and Vislab. These packages, costing hundreds of thousands of dollars are able to import static models and motion data from other modelling programs and animate the models according to the wishes of the user. This is the same software used by Industrial Light and Magic to produce special effects for movies such as *Terminator II* and *Jurassic Park.*

Data visualization software packages can import large data files generated elsewhere, as on the SP-2 supercomputer, and apply visual forms to the data, making the meaning of the data much more apparent. Examples of this kind of problem are finite element analysis, such as the flow of air across an airplane wing.



Source: Bruce Fritz

MAF director, Todd Tannenbaum, demonstrates the wavefront software that can be used in engineering animation.

Future Plans

Since the MAF intends to stay ahead of the rising technology curve, plans are already advanced for the next stage of equipment to be installed. According to MAF director Todd Tannenbaum, the next stage is real time interactive animation and its corollary- virtual reality (VR). Tannenbaum is "95% sure" that the MAF will soon receive a VR setup called an "Immersadesk," a seven by eight foot module that projects a VR image to a viewer wearing LCD shutter glasses and a gaze tracker. The screen will provide very high resolution to the user and be driven by a Silicon Graphics Onyx computer.

The MAF is currently concentrating mainly in the areas of engineering animation, data visualization, and parallel/ distributed computing

How to Become an MAF User

Students with a project roughly covered by the areas of focus at MAF (animation, engineering data visualization, and parallel/ distributed programing) who have a faculty advisor for their project can use the facilities of the MAF. Additionally the MAF maintains two lists: one of students seeking a faculty sponsor for a project; and the other of faculty members seeking a student to work on an existing project. The MAF actively matches students with sponsors. Students can receive credit and sometimes pay while learning advanced computing skills. Tannenbaum reports that several students have gone on to receive job offers based on their supercomputing skills gained at the MAF.

Author Bio: Jim Feldman is a returning student working toward a TCC certification. He is publishing a comprehensive history of the University buildings.

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Both Chuck and Jonas agree that this responsibility has enhanced their leadership and teamwork skills, as well as expanded their networking options within the College of Engineering and industry. A great deal of organizational skills as well as vision and an enormous amount of patience and dedication will be essential to make their dream for this year's Expo a reality. To help Chuck and Jonas accomplish this feat are thirteen committee chairpersons who each have people helping them. Just to give an idea of how large the involvement in Expo is, there are over sixty people working on the "Legos" project alone. It is obvious that there is an enormous amount of enthusiasm for this campus-wide activity. Both Chuck and Jonas have been involved with Expo for about two years. Chuck's involvement stemmed from being a volunteer at which point he became, "...fascinated with the goals and ideals of Expo." Jonas' visit to Expo in 1993, "...gave [him] the inspiration to seek education at the University of Wisconsin-Madison in the College of Engineering".

Chuck and Jonas are working together to help Expo grow and expand to reach its utmost potential. They feel that the biggest thrill of being leaders in the preparation of Expo 1997 will come in April when they can see everyone's time, effort, sacrifice and vision become a reality in the actual presentation of Engineering Expo 1997. They combine their individual strengths to expand the availability of opportunities that come from participating in Expo to as many people as possible and to ultimately make Expo the biggest success they can.

Author Bio: Sara Vail is going into Industrial Engineering and enjoying her "active" semester of SWE, *Wisconsin Engineer* and more SWE.

The Valentine's Guide to Happiness for the Engineering Student

Sarah Storm

It's that time of year again, when lovebirds everywhere begin singing their songs and people gaze starry-eyed at their sweethearts.

That's right, it's almost Valentine's Day, the 14th of February, the date when St. Valentine was beheaded and martyred during the persecution of the Christians in the 3rd century. Historically, it is reported that there were two St. Valentine's; one was a Roman priest and the other a Bishop of Terni in Italy. However, these two people may in fact have been the same person. St. Valentine may have been taken from Terni to Rome for the beheading, and people along the way, due to the lack of communication, may have thought that there were two St. Valentine's.

Although St. Valentine (one or both of them) was beheaded on February 14th, the exchanging of Valentine cards and gifts is not due to St. Valentine or his martyrdom. Rather, the tradition of sending Valentines relates to a medieval belief that the birds begin to mate on February 14. As Chaucer put it in *Parlement of Foules*, "For this was on seynt Valentynes day whan every foul cometh ther to chese his make."

Now for some interesting logic developed in the 14th century: Since the birds begin to mate on February 14, people should exchange tokens of their love on this day as well. This tradition has carried on through the years, with paper valentines beginning in the 16th century, and modern-day gifts including chocolates, candy, balloons, stuffed bears, and edible underwear.

The tradition of sending Valentines relates to a medieval belief that the birds begin to mate on February 14

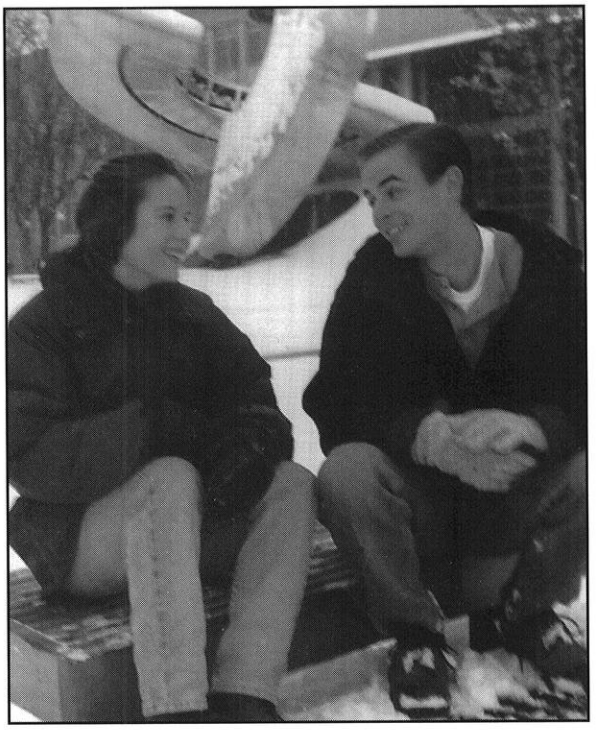
End of history lesson. So it's almost Valentine's Day and you're a loveless engineering student searching for that special someone. Or, maybe you already have a sweetheart but want to add some spice to your relationship. Or, maybe you couldn't care less about a sweetheart but want to beat the winter blahs.

In any case, I've come up with some suggestions to ponder during this season of love.

Try some of the following ideas and see if your Valentine happiness doesn't multiply exponentially. Good luck and Happy Valentine's Day!

Author Bio: Sarah Storm is a hopelessly romantic chemical engineer.

1. Stand on the engineering fountain and proclaim your love to your significant other.



2. Create a computer valentine at CAE and send it to everyone you know.

3. Calculate how many red cinnamon hearts a person would have to eat in order to get sick.

4. Using diffusion theory, calculate the amount of perfume or cologne that you would need to apply in order to overcome your entire engineering class.

5. E-mail all potential sweethearts and ask them out to study.

6. Hum love songs while studying your calculus/physics/engineering or any other subject.

7. Put heart stickers on your calculator.

8. Dress in all red and don't forget your pocket protector.

9. Concoct a love potion based on the ionic theory of attraction.

10. "Engineer" a bouquet of flowers.

12. Calculate the frequency and wavelength of the vibrations of your loved one's heartstrings.

13. Create a matrix of differential equations describing the behavior of two humans in love.

14. Calculate your heart rate when you're in the presence of that special someone.

15. Diagram the exact place in your heart that cancels out all logical thoughts at the mention of your lover's name.

Volunteer Work - Overseas in Ukraine

Roger F. Bindl

Occupational Safety and Heatlh Administration (OSHA) would condemn most of the country, while Monet would dot a canvas with beautiful impressions of the same buildings, structures, landscape, and people.

Ukraine has many cities where sanitary conditions need work, buildings stand in neglect, roads crumble, open man-holes and major sidewalk cracks await you, hot water only runs in the morning, hallway lights rest cold to save energy and it just isn't like home. Add to that a difficult language and Cyrillic alphabet; now it's easy for foreigners to feel intimidated.

Is there a paradox or a contrast?
At first, I saw Ukraine as a country of paradoxes. Buildings were crumbling and dirty, yet among them walked well-groomed, well-dressed residents. Busy sidewalks had dangerous holes, yet planned repairs weren't apparent; people simply walked around them. Manhole covers were missing on side streets; cars dodged them as they did the unfixed pot holes.

In the rural districts a small cemetery emerged from the mists of a large impressive corn field. Combines with flat tires and pieces missing lined a metal graveyard, while large fertile fields awaited the harvest. Long, open wires carried radio broadcasts to villages. Freshly cleaned and whitewashed barns awaited Belgium cows. Tired farmers rested in a cold yet elaborately painted sanitarium.

For two weeks I couldn't shake this thought - the paradox, the contradiction, mismatched pieces within a puzzle. Things just didn't seem to fit, but then this thought changed. Perhaps there wasn't a contradiction between people and environment, but a contrast in appearance. Ukrainians care about conditions, but don't have the resources to change everything.

Driving a car in Ukraine is much like riding a bike in Madison, Wisconsin; Stop signs, lanes, and pedestrians are simply obstacles or objects to be ignored

On the other hand it has beauty...
Once, on a river bank among empty bottles, partially submerged tires, and thick slimy water, a cluster of sunflowers caught my eye. Actually the flowers drew me in. The contrast was wonderful. Later that day, an evening sun created silhouettes—radiant impressions of those same crumbling buildings and structures. Beauty revealed itself to a wearied, puzzled traveler.

Rural Ukraine, in some ways, reflects its cities. Fields, fenced by trees, appear organized and well planned. The soil is rich, the weather is fair, and the terrain is suited to agriculture. Yet, half the fields are left barren. Machinery is old, broken and inadequate to cultivate the land. The country is precariously teetering on the edge of successful privatization and becoming a world bread basket.

Volunteer Work
The reasons for volunteer work, and working in under-developed countries, for me, are as vague as they are plenty. Try it for the travel, adventure, language, exposure, experience, curiosity, pleasure, misery or as a way to pass time.

In September 1996, I volunteered to work with Volunteers in Overseas Cooperative Assistance (VOCA) in Ukraine for three weeks. I've wanted to work overseas for a long time - although I can't really say why - maybe to learn a new language, experience something different, or just travel. So, this was an opportunity.

At times I seriously questioned the sanity of this decision. Upon arrival, I discovered that the toliet in the airport was merely a hole in the floor, the buildings were crumbling and almost slum-like and the water was contaminated. I was also struck by the unlit rooms, the soiled mattresses and other differences from home.

Things are different...
Driving a car in Ukraine is much like riding a bike in Madison, Wisconsin. Stop signs, lanes, and pedestrians are simply ignored. That's were the comparison ends. Urban Ukrainian adults don't believe it's dignified to ride bicycles.

Police in Ukraine are frequently on foot, yet automobile drivers are obedient enough to stop when whistled at. Blowing a whistle seems

to be enough, and Friday is a good day to be blown at. My Ukrainian host told me how you're very likely to be randomly stopped by the police on Fridays. The weekend is near, and the police need money.

People told me that Ukrainians mostly eat in. I also heard that dinner guests leave the table with very plump bellies. This led me to wonder: do Ukrainian's eat in because good restaurants are too hard to find, unsanitary, or costly. I think perhaps it's a combination of Ukrainians being good hosts, and being safe from food contamination.

Water is contaminated with bacteria and chemicals. Boiling kills the bacteria, but chemicals remain. Searching for water becomes a daily task. Small kiosks (eight foot square grocery stores) carry liters of water, but non-carbonated and non-sodium waters are hard to come by.

In many ways I liked the differences in Ukraine. Small enterprises thrive (in quantity if not in profitability), people appear homey, and there's a certain sense of innocence that U.S. residents lack.

Money matters...

As of September 1996, gryvnias and kopiykas became Ukraine's official currency. The former karbovanet (coupon) had five more zeros. In other words, cheap vodka use to cost 350,000 karbovanet, but now it costs 3.50 gryvnia.

Prices are relatively low compared to American standards. A fresh loaf of bread costs about 70 kopiyka. Coffee prices varied: a cup ranged from 50 kopiyka to two gryvnia. The exchange rate, in September, averaged about 1.73 gryvnia (173 kopiyka) per U.S. dollar.

Americans often pay higher prices. My flight from Kiev to Dnepropetrovsk cost $80. The same flight cost my Ukrainian interpreter $20. The hotel, in Dnepropetrovsk, cost me $48, and the interpreter $16. The art center cost me two gryvnia, and the interpreter 50 kopiyka.

Money is a major concern in Ukraine. Severe inflation appears under control, but precautions are still in effect. Some wages are withheld, as a control measure. People wait and wonder if they'll be paid. Money for construction, repair and growth is distributed randomly. Money is availabe for seemingly non-essentials, but not for necessities. I walked away, sharing this confusion with my interpreter - wondering if I'd misunderstood.

Source: R.F. Bindl

On one of the more typical street scenes of the Ukraine, a visitor will usually find that the buildings are run down, but still functional.

"Immigrants in their own country"

A Peace Corp volunteer commented that, "Ukrainians are immigrants in their own country." He clarified by stating, "They have lost so much economically that they must build up their lives from scratch, just like immigrants to America." He felt this was also true of the political system - it also must be rebuilt.

As the country continues to privatize, the economy seeks stability. New enterprises sprout, like wind planted seeds, as these "immigrants" taste capitalism. Perhaps their fondness of poets, historians, and monuments says much to their credit - they have much to take pride in.

Last impressions are lasting impressions?

My welcome to Ukraine, the Kiev International airport, felt cold. The corridors were chilly, unlighted, and empty. Toilets were holes in ground. My departure was the opposite. The departure area was pleasant, clean, and well lighted. The toilets were equivalent to those at home.

This last view of Ukraine only served to reinforce my changing thoughts. My lasting impression is one of contrasts between people, the surroundings, and structures.

Author Bio: Roger Bindl is a consultant with extensive background in computers and telecommunications. Also, with an exploration disposition, and fondness of travel, he recently volunteered three weeks to teach internet, electronic publishing and telecommunications in Ukraine.

For Entertainment Purposes Only ...

Let Me Tell You About Yourself

Diana Zeller

"You're an engineer, aren't you?" Every group in the world has a stereotype, whether or not they actually apply, and engineers are no exception. I wondered, to what extent do people hold specific stereotypes of engineers, and how well do they apply? In the past, people could pick out engineers by the ever familiar slide rule they wore on their belts. Technology has eliminated slide rules, but has it also managed to eliminate much of the stereotype? I aimed to find out what non-engineering students on campus thought of engineers by having them fill out a survey. Then, I had engineering students take the same survey to see how they compared. I told people that they need not have any opinions at all, in order to avoid inducing a stereotype, but nonetheless people had their opinions.

"Let Me Tell You About Yourself"
Generally you, the engineering student, are an intelligent, hard-working, logical and technically-minded individual who has the ability to solve problems. You enjoy spending quality time with machines and computers and tend to be introverted and quite boring. And, oh yes, you are also a male with that "macho" attitude. You may be creative, or not, they can't seem to decide; nor can they decide on whether or not you have any concern for the environment.

I know what you are thinking. I handed out copies of your journal to everyone I surveyed. They are on to you! They know about your Saturday night dates at the CAE and your passion for greasy tools. They also know how much you talk to yourself and how uninterested you are in what they have to say. So what do you really think?

"Let Me Tell You About Myself"
Actually, we engineering students have a remarkably strong stereotype of ourselves that very closely matches that of non-engineers. We said we have strong math skills, are motivated, hard-working, analytical and intelligent. We are problem solvers and decision makers. The level of creativity still remains split between the extremes of having no creativity and having a lot of it. We are also still men, which I find interesting since I can't recall ever being a man (however, it is true that statistically there are still more men than women in engineering). We managed to reach an agreement on the environmental issue, however. We care!! We really care!!

Source : Steve Lowrey

Are these fun-loving band members engineers or not?

Generally you, the engineering student, are an intelligent, hard-working, logical, and technically minded individual ...

"Throw Me A Beer!!"
The voice of the non-engineer says that we turn down all drugs except the ever popular alcohol, with the rule, "Weekends only." We drink somewhere between a little below average to a little above average, but in general are very sensible and responsible. Not bad traits, I suppose, unless you really want to have a lot of fun.

So are they right? The response from the inside, as a whole, would probably be best described as, "I don't know!" Each engineer seems to have a definite opinion on this topic, but the opinions do not all match. Some shout, "Drink, drink, drink!," while others

shout, "Booze is bad!" One participant argued the pro-side of drinking, "[The engineering student] always leaves time for what is important." Also, one generally thinks about the wild freshman and the sensible senior, but the results of the survey did not show that this was necessarily the case.

"Party!!"

So how much do we socialize? Do we hide in our rooms with the door locked, or are we throwing up on street corners while hundreds of admiring friends look on? Our friends in other majors say, again, "Weekends only!" Some of us get out more than others, but we are sure to not pick up the phone until Friday night rolls around. They also noted that we, as birds of a feather, tend to flock together. We socialize mainly with other engineers, and do a lot with different engineering groups.

For the most part, we agree with them. We don't do a whole lot in the area of fun until the end of the week, and our main group of friends consists of other engineers. However, we do socialize a lot outside of weekends, it just may not actually be any fun. Misery loves company, and so we all get together to sweat blood over the same homework assignments. So here, the interesting fact is that we seem to be the only college on campus that includes work in our definition of socializing.

"I Pulled An All-nighter...Again"

Hooray!! The first sign of total and complete agreement among the University of Wisconsin-Madison!! Engineers are widely known to study more than the average citizen (at the University). We are diligent, intense, hard, and long studiers. One non-engineer said that he sees us at Wendt all of the time. Let's all say "Hi!" One of the engineers said that we are not procrastinators. What do you think? Don't all answer at once now.

Engineering students have a remarkably strong stereotype of ourselves that closely matches that of non-engineers

Something Fun To Do

What are our interests and hobbies? "Survey says.." we like to fix things, create things and build models. Neat!! We are pretty handy! We also like sports, marching band, Trivial Pursuit and reading engineering magazines. Who could argue? Those all sound like fun things to do.

What did we think? Strangely, we think we are much more boring than that. We only stated hobbies and interests to be related to math, computers and our careers. What happened here? Where did all our zest for life go?

Source : Raechell Thuot

Engineers enjoying some free time or non-engineers? You make the call.

How can it be that others see us doing all of these fun things that we claim not to be interested in? I guess we should add this to our list of mysteries of the universe.

It's a Bird! It's a Plane! No, it's an Engineering Student!

Can people pick us out as we are walking down the street? In general, no, they said that they can't. So does that mean the stereotype is lifting? Well, no, it doesn't. Aside from the small number who thought they could pick us out due to our outstanding geekiness, the rest said that they couldn't pick us out unless they heard us talk. No one cared to explain what they meant, but I think we can call upon our imaginations to conjur up a really good guess. They did, however, explain their stereotype of how we usually look, even though they may not be confident that it is an engineer they are seeing. They say we dress more conservatively than the rest of the campus, with tennis shoes, sweatshirts and jeans being the norm. One person also said that a marching band uniform was a rather good engineering indicator. Another person said that they look like everyone else unless they are in Engineering Hall. I think we ought to have this phenomenon looked into! Headlines would read, "Students Physically Altered Upon Entering Engineering Hall: Technological Experimentation Suspected."

And now, the other side of the coin. Can we pick each other out? We didn't seem to agree on this one. Those who responded affirmatively said things like, "They look like nerds," and,

continued on page 21

Helium Three as a New Source of Energy for Earth

Dan Pierpont

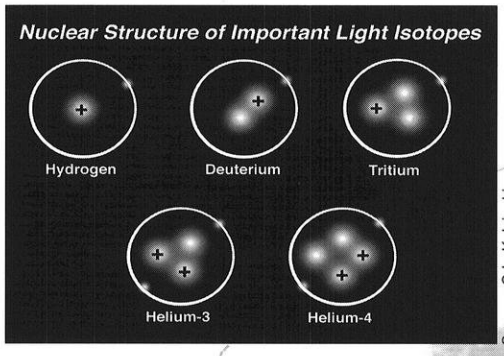
Looking into the twenty-first century, the need for an alternative energy source to fuel the world's demand for more power, is becoming increasingly apparent. How long can the world's oil reserves last? How long can we use coal for combustion? Is nuclear power a safe and endless energy source? What happens when the earth's natural resources finally run dry? All of these problems could be solved if we could find a new abundant energy source. Well, it just so happens that we have a new energy source that we are not taking advantage of. Helium three or ^{3}He fusion could solve the energy problems of the world for centuries to come. ^{3}He is found here on earth in relatively small amounts, which makes it very difficult to recover. However, it is present in large quantities other places in the galaxy, most importantly, the moon.

The need for more power is enormous and will contiunue to get larger as the 21st century begins

The need for more power is enormous and will continue to get larger as the twenty-first century begins. It has been estimated that by the year 2050, the average use of electrical energy will be five megawatt hours per person per year. For the United States alone, this number could be much larger since in 1990 the average energy was 11 megawatt hours per person per year. The big question is, where are we going to get all of this energy? By the year 2050 we will have used extensive amounts of our natural resources in order to meet the energy needs of the world. In fact, it is estimated that the oil and natural gas reserves could be essentially exhausted by the year 2050. The world's energy use has increased four- fold since 1940. Imagine the amount of energy we will need if it increases another four-fold in the next fifty years. As of January 1995, the world's fossil fuel reserves totaled around 7.5 trillion boe. (boe = Barrels of oil equivalent) When most of this is gone in 2050, we will certainly need another form of energy. It wouldn't be a bad guess to say that the next major war fought on earth will be related to energy and natural resources. If a new source of energy is discovered it will be possible to eliminate this potentially dramatic situation that could arise by the year 2050.

For the past couple of decades, scientists and engineers having been trying to predict where this new source of energy will come from. Some say nuclear power using uranium will be the answer, others think it will be solar power, but the power source which seems to be the best answer is fusion. We could use helium three (^{3}He) as a fusion energy source to power the earth for centuries to come.

The closest large source of ^{3}He is on the moon. It is deposited there by solar wind, which originates in the sun.



Source: G.L. Kulcinski

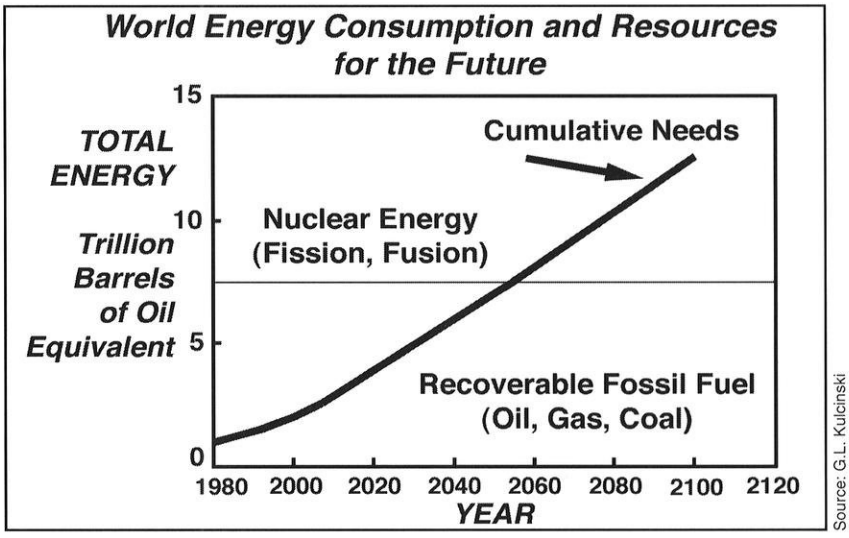
The gases at extreme temperatures in the sun's atmosphere form ions that get trapped in magnetic flux lines, which carry the ions throughout the solar system. Solar wind contains about four percent helium traveling at 450 km/s. This helium contains both ^{3}He and ^{4}He which comes from the helium that escape the sun without undergoing fusion. So essentially, this solar wind travels through space depositing this ^{3}He on the surface of the moon.

One day Dean Bollinger, the Dean of Engineering at the University of Wisconsin, was lecturing about energy in an Introduction to Engineering class, and he explained a very interesting idea. Let's think ahead a minute and pretend we could fly our space shuttle Discovery to the moon. If we could land the space shuttle on the moon, then fill the cargo with canisters of ^{3}He mined from the surface, and bring the shuttle back to earth that ^{3}He cargo could supply the entire electrical power needs of the United States for an entire year. That strikes me as an awful lot of energy, for such a small amount of ^{3}He, and in fact the energy

payback for one kilogram of ^{3}He is ~250. In other words, the energy you receive from fusion is 250 times the energy you put into obtaining the ^{3}He. This is amazing considering the payback for nuclear fission of uranium is ~15 and coal combustion is ~11. Of course the payback of ~250 for ^{3}He does not include the energy needed to make a fusion plant, and the energy used to make the fusion occur. However, even if we subtract this from the ~250, the energy payback is ~ 44, which is still significantly larger than all other current forms of energy .

If ^{3}He puts out this incredible amount of energy then there are sure to be harmful waste products, right? Wrong, the products of the ^{3}He nuclear fusion reaction have extremely low radiation levels. Actually, the amount radiation from ^{3}He fusion in comparison to nuclear fission of uranium is minuscule. This means that nuclear fusion of ^{3}He will be environmentally safe. Of course, we should also consider the environmental consequences of mining the ^{3}He on the moon. Will we significantly deplete the resources of the moon to the point that we would have minimal natural resources on the moon and on earth? The answer in no, the moon has a large source of ^{3}He. It is estimated that we could generate one thousand gigawatts per year of power for a thousandyears before we would have to worry about depleting the resources of the moon. Basically, there is enough ^{3}He on the moon to last for centuries, or at least until we can find even larger sources of ^{3}He, which are known to occur naturally on the gaseous giants Jupiter, Saturn, Uranus and Neptune.

One difficulty that arises when we get to moon is that we have to mine the ^{3}He from the surface. The ^{3}He carried by the solar wind is deposited in the lunar regolith, which is the pulverized rock found on the surface the moon. Because the moon has no atmosphere, the ^{3}He has been collecting in the regolith for billions of years, which explains its abundance. There have been many innovative ideas concerning the actual mining of ^{3}He from the surface. For instance, one idea is to use solar energy to power the mining equipment on the moon. These types of ideas could be very useful when the time comes to actually set up a lunar ^{3}He mining station.



Source: G.L. Kulcinski

If this ^{3}He is such a good deal, how come we haven't tried to use it yet? It all comes down to engineering a reactor which can successfully fuse the ^{3}He. Scientists and engineers are having trouble solving the energy containment for the reactors. Fusion reactors need to reach temperatures in excess of 100 million degrees Kelvin, which is obviously not easy obtain or contain. Knowledge about fusion has been steadily increasing over the past few years, but there are still many problems. Ideally, we would like to be able to solve our fusion difficulties around the beginning of the next century. Doctor John Santarius, of the Fusion Technology Institute here at the University of Wisconsin, is sure that we will solve the fusion reactor problems in the future. He explained that progress will probably remain slow, relatively speaking, until we realize that there will be a major energy crisis if we don't do something.

There is enough ^{3}He on the moon to last for centuries

There is also an economic factor for fusion of ^{3}He, in that flying to the moon is very expensive. The first couple of flights to the moon to recover ^{3}He could result in expensive expeditions, but with each successive flight, the technology becomes better, the expenses become smaller, and the return becomes larger.

It is clear that we will need a new energy source to fulfill the growing energy needs of the world. ^{3}He fusion could be our best bet in solving this energy crisis. If we can solve our reactor problems and collect ^{3}He from the moon we will leap into the 21st century with an abundant new, more environmentally safe form of energy, which will last for centuries.

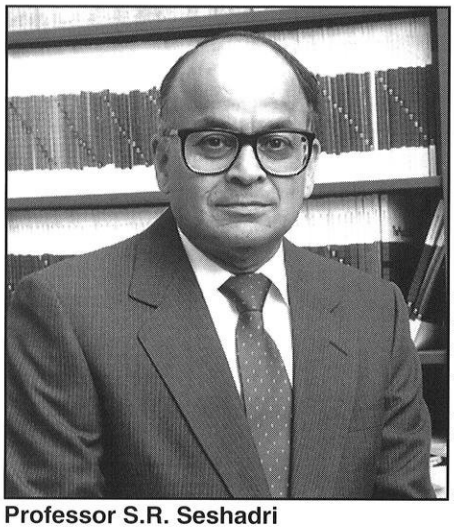
Author Bio: Dan Pierpont is a junior in Chemical Engineering who wishes he had more time to go golfing and skiing.

Resources:
1. "A Review of 3He Resources and Acquisition for Use as Fusion Fuel" by L.J. Wittenberg, E.N. Cameron, G.L. Kulcinski, S.H. Ott, J.F. Santarius, G.I. Sviatoslavsky, I.N. Sviatoslavsky, and H.E. Thompson. *Fusion Technology*. Vol 21, July 1992. Pages 2230-2253.

2. Web Site: http://elvis.neep.wisc.edu/~neep602/neep602.html Credit to G.L. Kulcinski.

Faculty Profile: Professor S.R. Seshadri

Rob Nelson



Source: Engineering Publications

Professor S.R. Seshadri

After finishing missionary school in India, where he was indoctrinated into religion at an early age, Dr. S.R. Seshadri was the pride of his school because, unlike most of his classmates, he was not from the upper class. With strong support from his family, he ventured forth to Madras University, also in India, to obtain BS and MA degrees in physics. His family further supported him as he started his engineering education at the Indian Institute of Science, one of the premier institutes in India. From there he came to the United States, at Harvard University, where he got his Ph.D. in 1959. " I had pretty happy times...When I came to Harvard I was fortunate to be associated with some of the best people in the world.", Seshadri says.

Seshadri still keeps in touch with the professor that guided him at Harvard. That professor, who had a strong influence on Seshadri, originally graduated from the University of Wisconsin and is now ninety years old. Even to this day, Seshadri still keeps in close contact with this professor. This caused him to have great respect for the UW and made his decision to come to the UW to teach easy. To further cement his decision, that professor was a friend of the late Dean Kurt Wendt, who our library was named for. This not withstanding, the dean at Harvard also had strong Wisconsin ties and his father was the well known mathematician in Wisconsin, Van Vleck, that another one of our buildings was named in honor of.

Teaching for Seshadri has been "like a life's mission". He actively pursues the study and research of education in engineering. "Basically I am interested in creating and propagating knowledge and teaching provides me the necessary intellectual stimulation" says Seshadri. In his present research, he is focusing on how to effectively teach students with various academic disadvantages in his ECE classes, interjecting that strengthening the "weaker links" improves the class as a whole significantly. He also believes in providing a good role model to his students. Working long hours, centering his life around his research and teaching is a given in Seshadri's job. In one quote, he told me with strong conviction, "Knowledge can not be generated by working from 9 to 5."

Knowledge can not be generated by working from 9 to 5- Professor Seshadri

Seshadri has many concerns about education and one is the length of time for an engineering student to get an undergraduate education. The desire of the engineering community and society in general, is for engineering students to acquire the necessary tools they need to become an successful engineer in four years (10% of their professional lifetime). However, this is unrealistic to students for several reasons. Despite these reasons, Seshadri believes an education can be attained in four years by not teaching engineering students everything they need to know, but by a focus on teaching "the tools to learn everything they need to know in the next forty years." One concrete example he gives of how to make an engineering education shorter is to take ECE220 (Electrodynamics-I, 3 credits) and ECE320 (Electrodynamics-II, 3 credits) and combine them into one 5 credit course. The average amount of time required for the student for one 3 credit engineering course is 10 hours including the time spent in class. However, a student cannot be expected to work more than 50 hours per week, and the course objectives must still be met. He also believes the typical Junior or Senior can handle no more than 14-15 credits per semester.

In addition, other problems to a four year education are found by those students just starting out. "In a high school education there are many omis-

sions and students find upon coming to the University, the jump is very big. It is necessary to start very slow in the Freshman and Sophomore years and slowly increase" Seshadri says. Thus, many students need to initially start slow with the number of credits they take each semester and ramp up the credit load over time; the peak number of credits should then be taken during their Senior year. In further complication, however, the typical engineering student finds it hard to take more than 4 or 5 courses and thus ends up taking 5 or more years to graduate.

As might be obvious, the time period taken by students is a large issue with Seshadri. Seshadri said, "Intelligence is nothing more than recalling prior experience." "We have to be able to educate the students to recall that prior experience quickly. Just by letting the students wander and finish in a longer periods of time, we are making a serious compromise on the quality of education." Seshadri adds with a gentle aura of confidence, "I think this 126 credits of courses is way too many and I think we can reduce it and fulfill our objective at the same time." Being an engineering student, I know from experience, the long period of time to get an education seems way too long.

A pitfall to shortening the time of education, he admits, is that there comes a time when too fast of a pace of learning is pushed on students. In this event, what the student does is "he prepares for one course when that examination is there and he neglects all the others. He is always out of sync with all the courses, he is never up to date in any course." Seshadri says. The ability of the student to learn is thus crippled. However, it might be emphasized that he is not advocating picking up the pace of education, but a whole scale reduction in the number of credits taken, credits that the student doesn't necessarily need.

Lastly, Seshadri has strong views on the educational system in the United States. At one time, people from all over the world came to the United States because the education was "the best". However, in recent times the educational attractiveness has somewhat declined. Three main arguments are used by him to argue this position. They sum up all that was good about the US system and is failing now, and they are: self discovery through experimentation, the opportunity to be a teaching assistant or give seminars, and the high level of professional ethics. Self discovery through experimentation gave students a high level of individuality and creativity while seeing theory in action first hand; this is still done, but the number of labs have been reduced over the years and lab equipment has gotten out of date. Next, teaching a class and giving seminars really tested a students knowledge, because there are no short cuts or opportunities to get outside help in this way. This has also declined somewhat, with time. Finally, in professional ethics, Seshadri told me a story that in India, the students taking exams were watched very closely for cheating during tests with one monitor for every ten students. Many students would readily cheat if given the opportunity. However, coming to the United States, he fondly remembers a student getting the blue books for a three hour exam and, without anyone policing the students, he was ghastly surprised to find no cheating while at the whole time the professor was absent. As is obvious today, ethics has declined a lot from what it once was.

In closing, professor Seshadri is a welcome teacher of education who has many bright ideas as he looks toward the future and reflects on the past. However, in the present he sees problems in the amount of time it takes to get an education and the problems with the attractiveness of an education in the US. In his last closing remark, Seshadri ventures, "Hard work and honesty are the two pillars" and we must work to build on these as they are our only hope.

Intelligence is nothing more than recalling prior experience

Author Bio: Rob Nelson is an ECE Senior. I'm looking toward the future with anticipation for the things ahead. I'm lucky to be at such a great university and wish you all the best of luck.

When Interviewing Becomes Your Life

Trisha Scott

Source: Raechell Thuot

Often during an interview, the interviewer gives the prosepective employee information on the goals and expectations of their company.

Interviewing is a very important part of your education. It represents everything that you have strived for and aspired to become... a professional. As graduation draws near, it is difficult to balance all the demands of this final semester. Despite all the stress, this is the reason you have worked so hard. You desire a career that will give you challenging experiences, various responsibilities, continuous growth and endless opportunities . This all sounds straight forward, but the journey through education has been long and tough. Little do you realize, it has only just begun. You are about to reach the most difficult and twisting road: the road of interviewing.

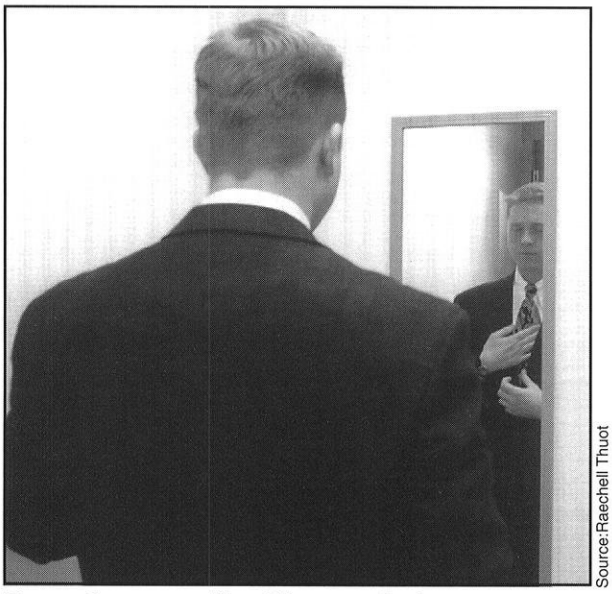
An engineering interviewee's life begins at 5:00 A.M., before the sun even comes up. You must get down to the Engineering Career Service (ECS) office to wait in the long tedious line for a spot on the interview list. You are not alone in this quest, some students actually camp out on the Engineering Hall couches. Many fellow engineers are patiently waiting for 7:15 A.M. when the doors of the ECS office open. Now for those of you who are not engineers, I am certain this sounds ridiculous. But our open interview process works on a first come, first serve basis. So, if you want to interview with a specific company, you must do whatever it takes to secure yourself a spot. This is your future!

An engineer interviewee's life begins at 5:00, before the sun even comes up

For some interviewees, the early morning routine may vary. These people are called "preselects". They have been selected by the company, in advance, to interview. Usually the preselected interviewee is notified by either a phone call or a letter. The preselection title enables you to sign up on a day designated only for preselected recruits. This means that you can come at anytime you choose on the day before the schedule opens. If, however, you are preselected and forget to sign up, you loose the guaranteed interview. The consequence for this mistake is that you must now scramble for a chance to interview along with everyone else.

After getting an interview, you must begin to prepare. Preparation includes researching the company and attending their open house. Both of these opportunities give you the chance to learn everything you can about them. This not only makes you knowledgeable about what job opportunities they have available, but it allows you to become acquainted with the people and the company prior to the interview. Remember to ask any questions that will help you figure out if this is the place for you. After all, it is your career.

So now you know about the company: their goals, training programs and employees. The actual interview is the next step. This is where it all pays off. Everything that you have learned in school is going to come together. Now is the time to sell yourself. Since you have done your research, you know that you are interested in their specific



Source:Raechell Thuot

Presenting yourself well is a must when interviewing for the "big job".

opportunities and you want this company to be interested in you!

Don't forget to get a business card and thank the company for coming to Wisconsin to recruit. The next step is waiting to hear... rejection or second interview. Even though rejections can be disappointing, use each as a learning tool to help you in future interviews.

Second interviews are exciting. They usually mean travel, hotels, dinners, fun and more information about the company. Second interviews include either a plant visit or an office visit. This interview is a little more intimidating, since it is not on your own territory. However, it is a great way to see the working atmosphere, to meet more co-workers and to learn about the company's benefits, advancement and training. Most importantly, the interview will help you decide if you and the company are right for each other.

The company might give you an offer at this time, but do not feel pressured into saying "yes" right away. Take some time, look over all of the information and make an educated decision. It may be a good idea to list the most important aspects of your "ideal" job. These may include the people, location, training, advancement, benefits and wage. Compare the factors that are most important to you and find the company that most fits your needs, desires and future. Keep in mind: this is your decision.

Interviewing is extremely time consuming but necessary. You must bear in mind that school is still a priority. Without a degree, a job offer will not do any good. Even though it is difficult, remember that attending class, completing homework and projects, maintaining involvement in extra-curricular activities and studying for exams is still important. Balancing and budgeting your time is essential during this hectic semester. There is a light at the end of this tunnel, it's called graduating and saying **"Yes, I accept your offer!"**

Author Bio: Trisha Scott is an Industrial Engineering major and has finally closed this interviewing chapter of her life. YES!!

Parking Problems Driving You Crazy?: Vision 2000 Paves Way for New Parking Ramp

Jennifer Schultz and Michelle Truscott

Vision 2000, which started ten years ago, is the College of Engineering's (COE) plan to expand and update facilities for students and faculty in order to improve the quality of education. According to Dean Bollinger, "[Vision 2000] is a campaign to establish the College of Engineering as a leader in engineering education, techonolgy and research for the twenty-first century."

Vision 2000 includes plans for a new builiding, remodeling many existing facilities, and funding for scholarships. As result of this modernization, the state will build a parking ramp where Lot 17 currently stands, due to the lose of parking areas that construction will create. In order to implement Vision 2000, $100 million must be raised to cover construction costs. The goal of the COE is to have this money by the year 2000.

Currently, the engineering campus has a space deficit of 160, 000 square feet. To make up for the space deficit, COE rents office space all over the UW campus. In addition, many faculty offices are combined with labs in an attempt to use what space the COE does have to its fullest extent. Because of this space deficit, a big problem on the engineering campus is the lack of workshop space and storage for student projects.

Lot 17 wil soon be replaced with a parking ramp which is part of Vision 2000.

The most publicized part of Vision 2000 is the Engineering Centers Building (ECB), which is being planned to alleivate some of the space needs of the College of Engineering. Dean Bollinger feels the ECB is "...a crucial step for acheiving learning," as it will house a student leadership center, workshop areas for student projects, the technical communications certificate (TCC) program and several focused research centers.

Vision 2000 is already underway. The renovation of the Material Science and Engineering building, costing six million dollars, half of which comes from the state, is the first stage. Another proposed project is to build covered walkways to connect the buildings on the engineering campus. "This will be an important step to building rapport between faculty and students, " said Dean Bollinger. The Dean went on to explain that the walkways would encourage faculty and students to take advantage of all of the buildings on campus not just the one which houses their departments.

One final aspect of Vision 2000 deals with what is perhaps one of the biggest problems on the engineering campus: lack of parking. This problem affects not only the COE, but the entire university. The Madison campus has the worst parking ratio in the Big Ten. There are 195 spaces for every one thousand people.

To improve the parking situation on the southwest corner of campus, Lot 17 will be replaced by a parking ramp which will give approximately 300 more spaces. Lot 17 is the surface parking lot between Engineering Hall and Camp Randall Stadium. The ramp is being constructed to make up for the lost parking created by Vision 2000's plans to build on surface lot 14 (between General Engineering and the temporary buildings on Breese Terrace, will be replaced by the new Engineering Centers Building).

All parking on campus is controlled by the University Department of Transporation. The ramp itself is being entirely paid for by the state. It will cost $16 million, but in time, revenue from the ramp is expected to pay for the cost of construction and maintenance. This amount is not included

in the Vision 2000 plan because the COE does not have any control over parking on its campus.

The importance of a close relationship with industry, creates a need for visitor parking on the engineering campus. Everyday, between 150 and 200 representatives of industry visit the campus. According to Dean Bollinger, "The COE's biggest problem is that we have no visitor parking." Many of these representives are on the campus to interview students for internships, co-ops and permanent employment. The new ramp will hopefully provide more parking for visitors. Dean Bollinger would like to see the ramp fully computerized, with access codes given to vistors allowing them entrance to the ramp at the expense of the host organization.

The ramp will cost $16 million... revenue from the ramp is expected to pay for the cost of construction

Currently, visitors to the engineering campus have to fight with students for the few metered spots in front of engineering hall. These spots are usually filled by 7:45 a.m. During special events, such as EXPO and Career Connections, the meters are bagged to reserve spots. The COE pays a fee to the Department of Transporation in order to have this done.

Because of the COE's unique location with proximity to Camp Randall, the ramp will also be used for athletic events, just as Lot 17 is now. During athletic events, Lot 17 is used as special events parking. Faculty, who pay $400 a year for a parking permit in Lot 17, are not allowed to park in the lot on such occasions. Generally, this is not a problem, however, with the added visitor parking in the ramp, this situation could be improved even more.

Most of the concern around this project has to do with what kind of an impact the ramp will have on traffic. Dean Bollinger feels that there will be virtually no impact on the traffic flow because the number of added spaces in the ramp will be countered by the absence of other surface lots. He also feels that people are constantly coming and going so there aren't really any specific times when traffic is extremely congested. There will be two access routes to the ramp: one from Randall Ave. by way of Engineering Drive (the road in front of Engineering Hall), and the other will be a new drive between the Mechanical Engineering building and the new Engineering Centers Building. There will be no access from Breese Terrace.

Parking has always been an issue on campus. While a number of people do use public transporation, ride bicycles or carpool, there are still many people who like the convience of having their own car on campus. In a UW poll, reported in the Isthmus (April 26, 1996), "88% of respondants claimed that *no* incentive would get them on a bus." This attitude may be on the rise as more students are commuting from areas outside of Madison. The bottom line is that many people, students and faculty, are not ready to give up their own vehicles. Therefore, the parking spaces which will be lost due to stages of Vision 2000, such as the construction of the new Engineering Centers Building, need to be replaced.

While the parking ramp will provide 300 more parking spaces than are currently available, it's main intent is not for extra parking, but to compensate for that which will be lost due to building construction. The College of Engineering wants to moderize its facilities in order to educate engineers for the twenty-first century. Vision 2000 was created for this purpose, and the need for a new parking ramp was created by the plans included in Vision 2000.

Author Bio: Jennifer Schultz and Michelle Truscott are very talented editors. They also know every song that comes on the radion no matter what station is playing. Now that is truely amazing!

"La Familia"

Veronica Narvaez

At a large university, it may seem difficult to get involved with a group where you feel you can make a difference. Although this might be the case elsewhere, it does not happen in the University of Wisconsin-Madison chapter of the Society of Hispanic Professional Engineers (SHPE). SHPE is a national organization whose main objective is to promote Hispanic involvement in fields of science and engineering. Nationally, there are thirty-one professional chapters and 109 student chapters.

The Madison chapter of SHPE is a relatively young organization. It was founded in 1991 by two students who, after being exposed to the national organization, realized that it would be beneficial to have a chapter at the University of Wisconsin. After a lot of hard work, the wheels were finally set in motion. Steady recruitment by people affiliated with the organization has led to increased membership. Part of the reason for this increase is due to the fact that there is a very comfortable atmosphere within the group. Among the members, the organization is referred to as "*La Familia*," (the family) with a place for everyone. Sophomore Raquel D'Onghia stated, "It supports you not only academically, but socially, as well. There are people there that care about you and can help you with any problems, not just academics. It's not just a place to go get information about industry, but a place to feel welcome, make friends, and relax from your engineering classes."

The SHPE chapter is dedicated to helping its members reach their fullest potential. They do this by holding various seminars each semester. These include workshops from résumé writing to leadership skill building. Workshops are also given at the SHPE conferences held nationally. The chapter does not limit its boundaries to the university level. It extends its programs into the community, as well. SHPE devotes some of its time tutoring local area middle school students in order to help students to reach their potential.

Even though it is a young organization, SHPE has competed with other organizations in numerous activities. One of the latest awards that SHPE can boast is for the display they created for Engineering Week in spring '96. SHPE took part in the Display of Societies held by the College of Engineering. Along with information about the chapter, their winning display included everything from home-made salsa, made on the spot, to dancing provided by the members. Another event that SHPE is continuously involved in is the bi-annual Engineering EXPO held on campus. In the EXPO held the spring of '95, the organization was given the honor of formally presenting the Descendant's Fountain. As always, this was done with flair and enthusiasm with several dancing groups and speakers.

Talking about SHPE is one thing that every member seems to enjoy doing. If you are interested in the organization, direct e-mail to the SHPE account at SHPE@caelab1.cae.wisc.edu. Their web page can also be visited to obtain further information. The address is http://www.cae.wisc.edu/~shpe/.

Source: Raechell Thuot

SHPE members gather around their display during a student organization fair held for E-week.

continued from pg. 11

"They carry TI-85s with them wherever they go." Maybe technology succeeded in switching from slide rules to calculators. Others usually responded with a simple "no" and no accompanying explanation, or with, "Engineering students are not geeks with glasses, always in the books," or some version of this.

Throw the Survey Out the Window!!

Does this survey serve any purpose to us? On a practical level, probably not. No social injustices were uncovered, and no abusive situations were unveiled. However, each person that was surveyed claimed to know an engineering student, and was probably basing their opinions on the people they knew. So maybe the outsider's view is a valid one, as well as our own. Look at the level of uncertainty or non-uniformity among people. If nothing else, this proves that we are all unique individuals, capable of retaining our own personality traits even as we all pass through the same doors every day. The stereotypes just serve to try to find some common bond that links us together. So is the engineering stereotype really all that bad?

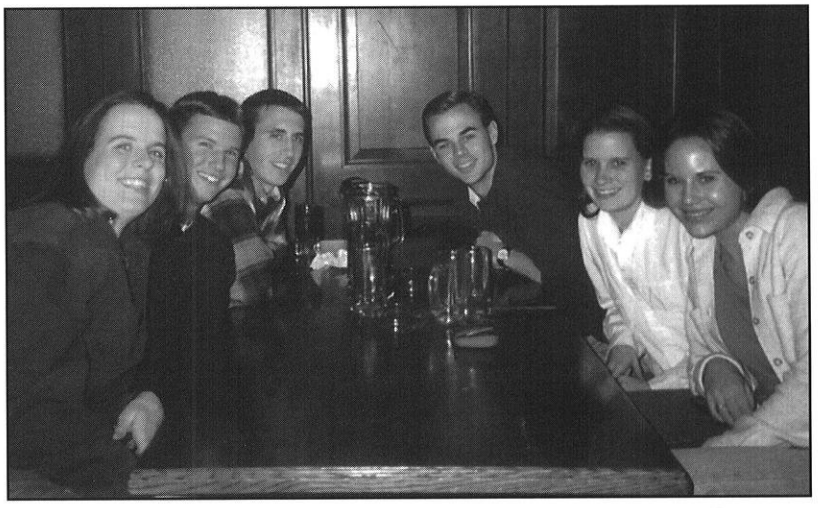
Author Bio: Diana Zeller is a senior in Industrial Engineering.

Farewell and Good Luck

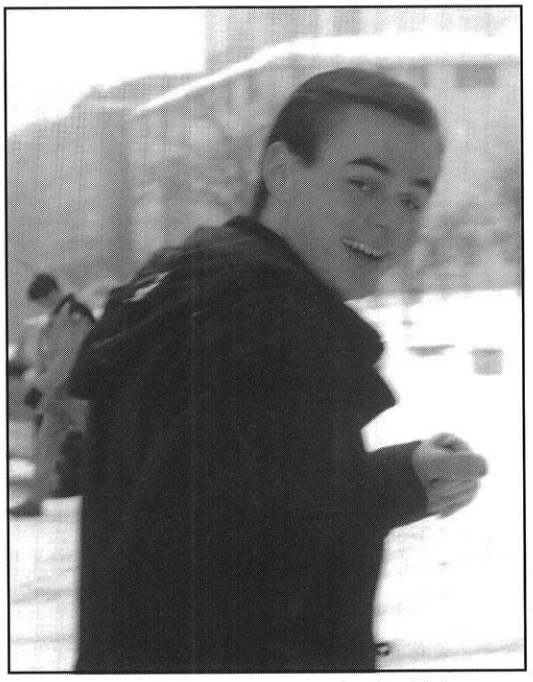
The Staff of the *Wisconsin Engineer*

Jonathan William Furniss has been with the *Wisconsin Engineer* for over three years. During this time he has managed to hold almost every position on staff including Editor-in-Chief, General Manager, Circulation Manager, writer, production staff, drink mixer, gopher, and the list continues. Basically, Jon has done it all when it comes to helping out the magazine's staff.

This past December Jon **finally** graduated with a degree in Mechanical Engineering. There were times when we all wondered if Jon really wanted to graduate and get a job, or if he was just enjoying his current job as a full-time student. We wish him luck in his new job and hope that he never forgets his friends back in Madison still working on the magazine. And just for old times sake we would like to say "WOOOOOOOOOOOOOOOO WHOOOOOOOOOOOOOO!!!"



Jon has shared many good times with the staff of the Wisconsin Engineer, and above is one of those times.



Jon is in one of his usual go-lucky-kick-up-your-heels-and-let-the-sunshine-in moods.

JustOneMore

Many of us have often wondered what the key to success was. How does one succeed in today's business world. Well, after extensive calculation and study, we have determined that by applying some simple algebra to some trite phrases and clichés, a new understanding can be reached of the secret to wealth and success.

Here it goes:

Knowledge is Power
Time is Money and as every engineer knows,
Power is Work over Time.

So, substituting algebraic equations for these time worn bits of wisdom, we get:

$K = P$ (1)
$T = M$ (2)
$P = W/T$ (3).

Now, do a few simple substitutions:

Put W/T in for P in equation (1).

This yields:

$K = W/T$ (4).

Put M in for T in equation (4), and this gives:

$K = W/M$ (5).

Now we've got something. Expanding our equations back into English, we get:

Knowledge equals Work over Money.

What this MEANS is that:

1. The more you know, the more work you do and
2. The more you know, the less money you make.

Solving for Money, we get:

$M = W/K$ (6).

Money equals Work over Knowledge.

From equation (6) we see that Money approaches infinity as Knowledge approaches 0, regardless of the amount of Work being done.

What this MEANS is:

$W = M*K$ (7).

Work equals Money times Knowledge.

From equation (7) we see that Work approaches 0 as Knowledge approaches 0.

Overall, what this MEANS is:
The stupid rich do little or no work.

Working out the socioeconomic implications of this breakthrough is left as an exercise for the reader.

Contributed by Neil Burgard from an unknown source.

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