Engineers' Forum

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Copyrighters Byte Back

a look into the future of digital media

Also Inside: Skateboarding, Spy Bird, Photo Spread

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223 Femoyer Hall
Virginia Tech
Blacksburg, VA 24061

Phone: 540-231-7738
Email: forum@vt.edu
URL: http://fbox.vt.edu/eng/forum

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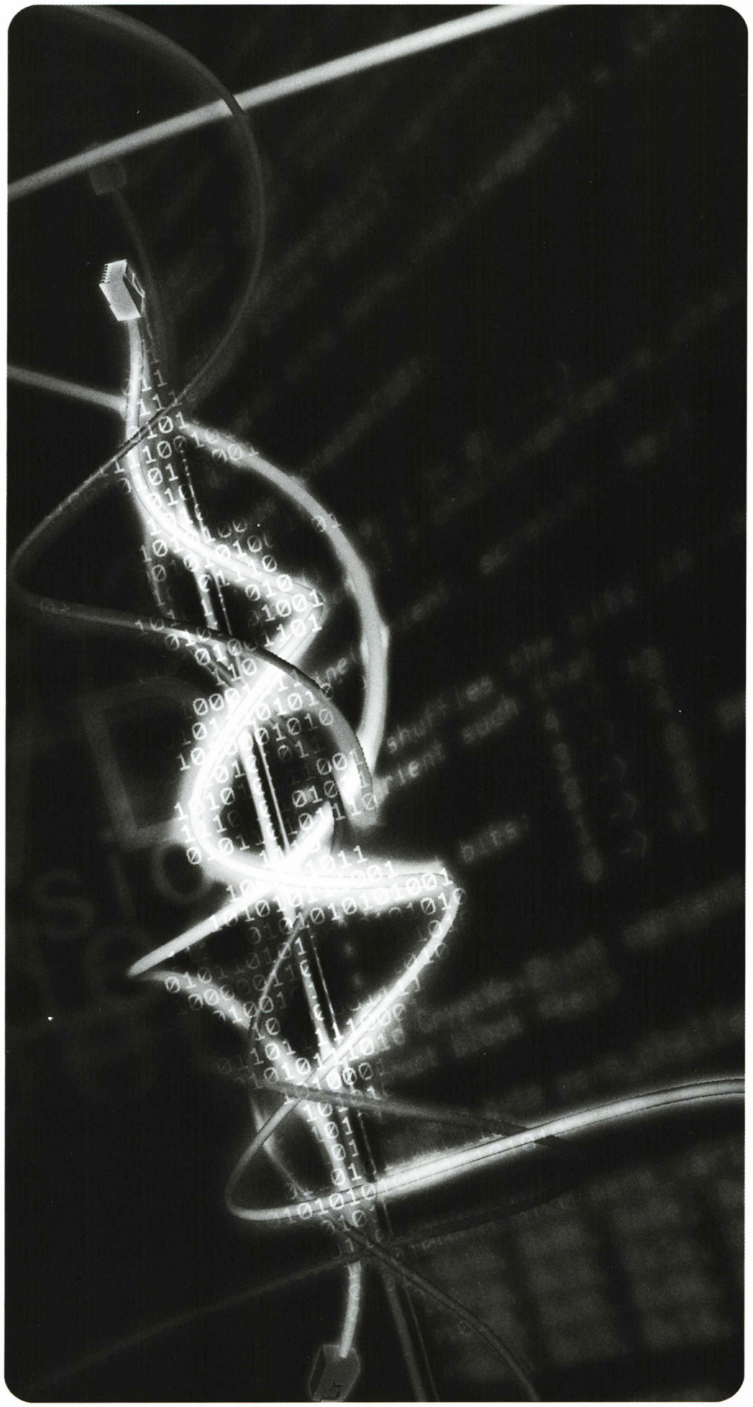


Cover Art by Brian Mcgill

Spy Bird

written by Sarah Lewis

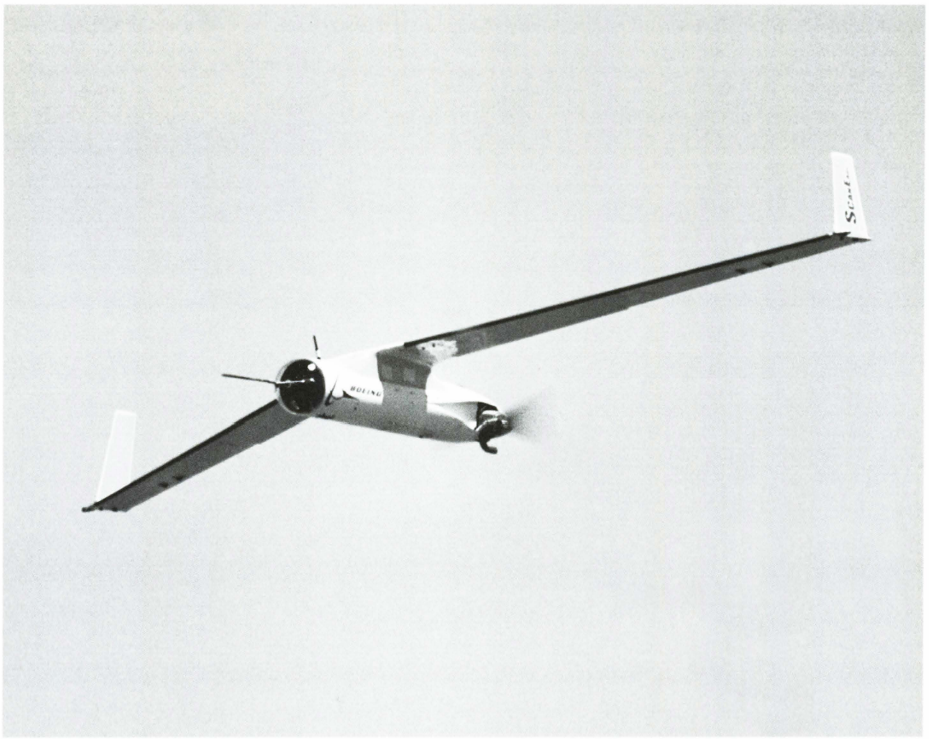
Just about everyone has heard something about the robotics industry, and of course there is the typical elementary school essay question: if you could design a robot, what would it do? The most common answer being: do your homework for you, of course. While this would be a great invention (and any kid who actually designs a working one will get an order from me immediately), a more feasible answer that does not receive as much stagelight, but is currently in production, is a small autonomous plane that could do such tasks as taking spy pictures and looking for fish. The Scan Eagle and Sea Scan are just such planes, however.

The Sea Scan is a small autonomous aircraft that works off a shipboard base. Its current use is intended mostly for fishermen, because it can search for fish for up to three days at a time and send the information back to the base ship, and then return to its shipboard base. President of Insitu, Steve Sliwa, hopes to begin to sell the aircraft to the fishing industry in 2003, and other markets, such as coastal scans and weather detection, shortly after.

The Aerosonde model of the Sea Scan, which flew from Newfoundland to Scotland using only 1.5 gallons of gasoline and twenty-seven hours for the trip, became the first robotic aircraft to fly across the Atlantic Ocean. The flight path itself was a replica of Charles Lindbergh's famous trans-Atlantic flight in 1947. The Sea Scan was designed and built in the small Washington town of Bingen, along the Columbia River, by Insitu Corp. It uses the GPS (Global Positioning System) systems to navigate with microchips and "high-capacity data links" to receive information from its base.

Insitu Corp. is a small company with only about ten employees, but they have been designing and building robotic aircrafts since 1994 and are well respected among many UAV(Unmanned Aerial Vehicle) circles. Last February, however, they attracted the attention of Boeing and signed a contract to design and build a completely autonomous aircraft with Boeing.

The new design was to be based on the Sea Scan. According to the fifteen month contract Boeing and Insitu signed, Boeing will provide the communication technology and the technology for the payload, the sensing equipment, cameras, and all the other components that send the information back to the base control. After the project is completed, the Boeing version of the plane will then be sold to the United States Defense Department, to go along with the X-45A robotic fighter that Boeing is completing. According to Sliwa, the contract with Boeing will more then double the revenue for the company, reaching the $2 million mark, up from $700,000 in 2001.



The Scan Eagle soars high over, leading the flock of UAVs entering the marketplace

The Scan Eagle is a total of four feet in length, and has a ten foot wingspan. It can fly a maximum of sixty-eight knots and weighs thirty-three pounds. On Wednesday, June 18, 2002, the Scan Eagle completed its first successful, completely autonomous flight, remotely piloted only for take-off and landing.

The flight took place at the Boardman test facility, in the eastern part of Oregon. It took off using a pneumatic catapult and then flew a pre-programmed flight path for forty-five minutes, with a maximum altitude of 1,500 feet. While on this flight, the Scan Eagle performed a number of sequences testing its GPS and ability to handle "real-time updates" to the pre-programmed flight sequence from the ground control. The plane landed using the SkyHook method, where the Scan Eagle connects to a rope attached to a 30 foot pole.

The goal of the program is to create a minimal cost, maximum-endurance UAV for multiple uses and customers, both military and industrial. Boeing themselves are the largest manufactures of military aircraft, with a total of over 130,000 delivered to the United States government and other customers from around the world. The final price of the aircraft has not been released, but it is expected to be under the $100,000 mark. Within the next 20 years, it is predicted that the market for these planes will reach $1 billion.

Unmanned Aerial Vehicles are used for numerous purposes. The Scan Eagle, for example, is built to fly both independently and in groups ("swarms") to provide intelligence to the military. These types of planes can be equipped with digital video cameras, chemical-weapon detection systems, communication supplies, etc. For example, they have already been used in battles in Afghanistan with the Al-Qaeda troops.

Planes of this sort have been used since World War II for military intelligence, and have been getting more and more sophisticated as time progresses. The air force of Israel did some of the first research and built some of the first smaller, minimal-cost autonomous planes. The Pointer, built in the late 1980's was the first small, low-cost UAV (model sized), with a nine foot wingspan, to be designed and manufactured commercially. It was built by Aero Vironment Inc. in Simi Valley, California, originally designed for the Marines, and was a remote controlled aircraft with a battery powered electric motor. As time progresses, they will get more and more sophisticated, with longer flight times, and more features in less space.

Feild's Effects

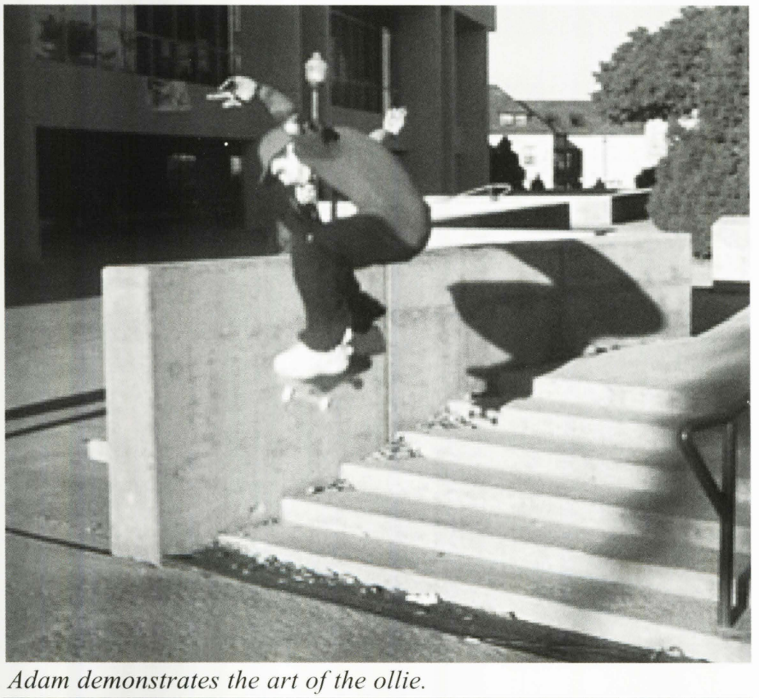
written by Kate Feild
pictures by Landon Fraser

>> The Science of Skateboarding

Skateboarding has seemingly evolved from a 1980s rebellious activity to a marketing powerhouse. Due to a generation that may possibly be bored with conventional sports, "extreme sports" have gained popularity. The X Games, an Olympic-like event focusing on activities such as skate, snow, and wakeboarding, were begun in 1995 and have gained popularity each year of its existence. Volunteering at the X Games this summer in Philadelphia was an experience for me, as the crowds of people surpassed anyone's expectations. Pro skateboarders such as Tony Hawk and Andy MacDonald have gone from being what some people may deem "juvenile delinquents" into pop culture stars and role models. With this emergence in popularity, companies are more willing to put money forth into research to advance skateboarding technology, which I like to call the science behind skateboarding.

According to Michael Brooke, author of "The Concrete Wave," skateboards started in the early 1900s as two-by-fours with steel roller skate wheels connected to them. In 1959, the first Roller Derby skateboard, complete with clay wheels, was available for the market. Clay wheels were less expensive to produce than steel, but tended to be a worse ride. In 1963, a company called Makaha designed the first professional skateboard, and popularity for skateboards grew considerably in a short period of time. By 1965, however, due to lack of new technology, skateboarding died to the general public, and only remained underground for the fans that still yearned for sidewalk surfing.

The second outbreak of skateboarding was due to a surfer by the name of Frank Nasworthy, who went to a roller skate factory in Purcellville, Virginia, in 1970 and found that the urethane wheels



Adam demonstrates the art of the ollie.

being produced could fit onto a skateboard. It took about three years for skateboarding to emerge again, and skateboarding technology has never been the same. New precision ball bearings began production in 1975. Companies sprang up, creating new maneuvering and board technologies. Boards themselves grew in size to allow for better stability.

How can skateboarding be enhanced using ideas from physics or math? Quite frankly, that's the only way skateboarding can be enhanced. The design of every piece of the skateboard involves some sort of thought into the shape or materials used in production. The turning mechanisms (called trucks) on skateboards weren't even designed for quite some time after skateboarding began. They allow the skateboard to only swing in a certain arc to get the best turn with the least resistance. Dave Gesmer, a pro skateboarder, used Mathematica to design new trucks. He utilized a series of complex equations to describe skateboard turns in relation to how a skater shifts his weight. DuPont™ has developed a new fiber called Kevlar® that is being used in a new kind of skateboard called Fusion™. This fiber is more durable and lightweight than wood boards, and has been tested to withstand 1000 pounds worth of pressure. Wheels changed from steel, which offered little traction, to urethane, which has good abrasion resistance, grip, and resiliency.

After discussing the science behind the engineering of skateboards, we need to look at the physics behind skateboarding techniques. Granted, you don't have to be a physicist to be a decent skateboarder, but understanding how skateboards react to forces could potentially help someone to ride better. Take, for example, a trick called an ollie, which is essentially just a jump off the ground, keeping both feet planted on the skateboard. It seems like an easy trick, but without the proper technique, it can be nearly impossible. Before a skater can even attempt this trick, he/she needs to realize that three forces, namely, the force of gravity on the rider, the force of gravity on the board, and the force of the ground pushing up on the board, are acting on them. The skater needs to exert a force on the back of the skateboard, causing the board to angle toward the back wheels. When the back of the board hits the ground, the ground exerts an upward force onto the board, which causes the board to jump up and pivot toward its center of mass. When the skater exerts a force on the front end of the board, the board pivots even more toward its center of mass, until it is parallel to the ground again. Eventually, the force of gravity overcomes the other forces, and the board and skater come back down to earth.

That's going to leave a mark.

This is an example of physics that, if taught in high school, I may have actually understood. It is a concrete example that can be proven using videos of athletes. So why do teachers not use this in the classroom? A new culture of professors seems to be emerging, focusing on sports to teach sciences. One of those sports happens to be skateboarding. To learn about projectile motion, a student merely has to watch a video of Tony Hawk doing a jump. For the not-so-skateboard savvy, websites have popped up to teach professors skateboarding so that they can teach students physics. As an example, the self-proclaimed "Doctor Skateboarding," Bill Robertson, has a Ph.D. in Education and uses physics to help professors learn about skateboarding and skateboarding to help students of all ages learn about physics.

No matter how you look at skateboarders – as hoodlums or role models, delinquents or physicists, there's one thing you have to agree upon: skaters can take architecture that to some people would be ordinary and turn it into an aerial display that is altogether spectacular. They can take what may be a dull physics rule and present it in imaginative ways. They can take a board, some wheels, and laws of science and make something beautiful.

Special thanks to Adam Russell, Thomas Flowe, and Graham Corson for being our skateboard picture guinea pigs.

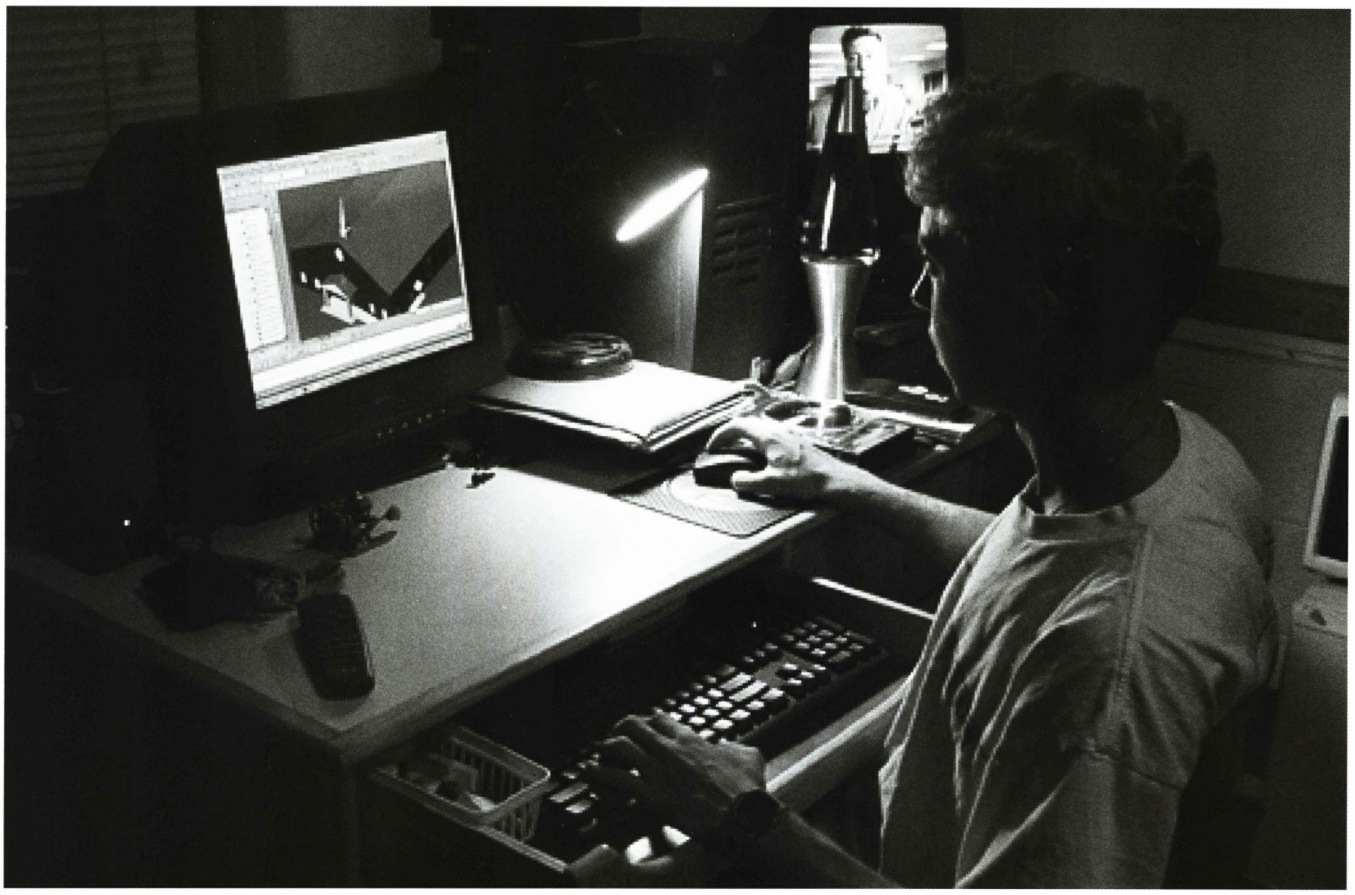
EF Church

written by Nathan Staley, Sheila Ranganath, Jennifer Moore, and Preston Brown
pictures by Professor Pat Devens

Throughout the course of the semester, the students of Engineering Fundamentals 1016 (EF 1016), have strived to learn about Engineering design and graphics. While many of the concepts they learned were important, the most substantial one was the Engineering Design process. In our class, we were exposed to the design process by working on a design project. The design project's purpose was to allow students to gain real experience in the engineering world that would give us a feel for engineering and guide us through the rest of our professional careers. In all the EF 1016 classes, students were divided into groups of four, and asked to either create an innovative project or choose from the projects that our instructor had available. Among the various projects assigned were frisbee launchers, key rings, backpacking tents, and airplane security systems. The Frisbee launcher project had the potential of meeting in competition for a grand prize of $500. The launcher had to be designed with the ability to hit targets at varying distances. If asked, most students will tell you of the hours they spent laboring over their mandatory group project. However, they will also tell you that their efforts were not in vain. Not only did the students of this class gain valuable hands-on experience, but they also enjoyed exploring the field of engineering through the design process.

The most realistic project was offered to two groups in each EF 1016 class by the class coordinator, Professor P.E. Devens. He was working on the project with other engineers at the time. Professor Devens saw the opportunity to present the engineering group creative, new, and innovative ideas, while offering his students the opportunity to submerse themselves in the construction and engineering processes. The project objective was to design a church that would replace the old St. Mary's Catholic Church in Blacksburg, Virginia. The old Catholic church was far too small to withstand the recent growth in its congregation. The church purchased a 36-acre plot of land, far larger than the space they had available. On this plot of land, the church was hoping to place an elementary school, Fellowship Hall, recreational fields, and a traditional looking, yet expandable church. Not only did our team have to take into account the constraints the church community gave to us, but we also had to make sure our design complied with the Blacksburg town building codes. Professor Devens has since submitted our ideas in combination with the ideas of past design teams to an engineering firm for consideration in their actual design. We hope a few of our ideas will be incorporated into the final project design so that our arduous planning efforts will be permanently embodied in the church's architecture.

Our group consisted of four team members. We had 13 weeks to pull together and come up with a final design, which was a diffi-



EF students spent many late nights designing churchs and other structures that might eventually be built at the new church location

work this design would require. Jenn was quoted as saying, "It was all very overwhelming at first, but we knew we had to start somewhere." That is exactly what our group did. We had our first formal meeting and made a time schedule of what needed to be accomplished and when. Then we assigned jobs to each member of the group. We divided up some information that Professor Devens supplied to the group, which consisted of building codes, church construction plans, and constraints that St. Mary's had set for their new church. We read through it all highlighting pertinent information that applied to our final design.

We decided it was important to take a look at the old church. A trip to the church allowed the group to see the flaws in design and sanctuary seating, which constituted the need for a new building. We then had a clearer picture of what was required. St. Mary's church was very modern-looking and, from the exterior, no one would ever know it was a house of worship. When we first approached the church, our group looked on in disbelief, because we all had the same thoughts. Upon entering the church, our thoughts were voiced by Preston as he said, "The sanctuary could double as a gymnasium."

Spring Break was creeping up on every college student. Our group knew that even though there wasn't school, our project still had to go on. We were engineers, and we had an assignment to complete. Each one of us took photos of churches in our local communities. Sheila, a member of the group, visited a construction site for a Methodist church. There, she personally spoke to the head architect and took photos of the church. We all returned to school and compiled our research materials which consisted of photos, floor plans, and online information. Jenn, another member of the group, was quoted saying, "I spent hours of my spring break driving around photographing churches for the project!"

Once we had this information together, we started discussing the important criteria which we desired in our church. We then made drawings of floor plans and exterior designs that would fit the plot of land. Time was getting short and we had to choose a design to

EF: Continued on Pg..14

Copyrighters Byte Back

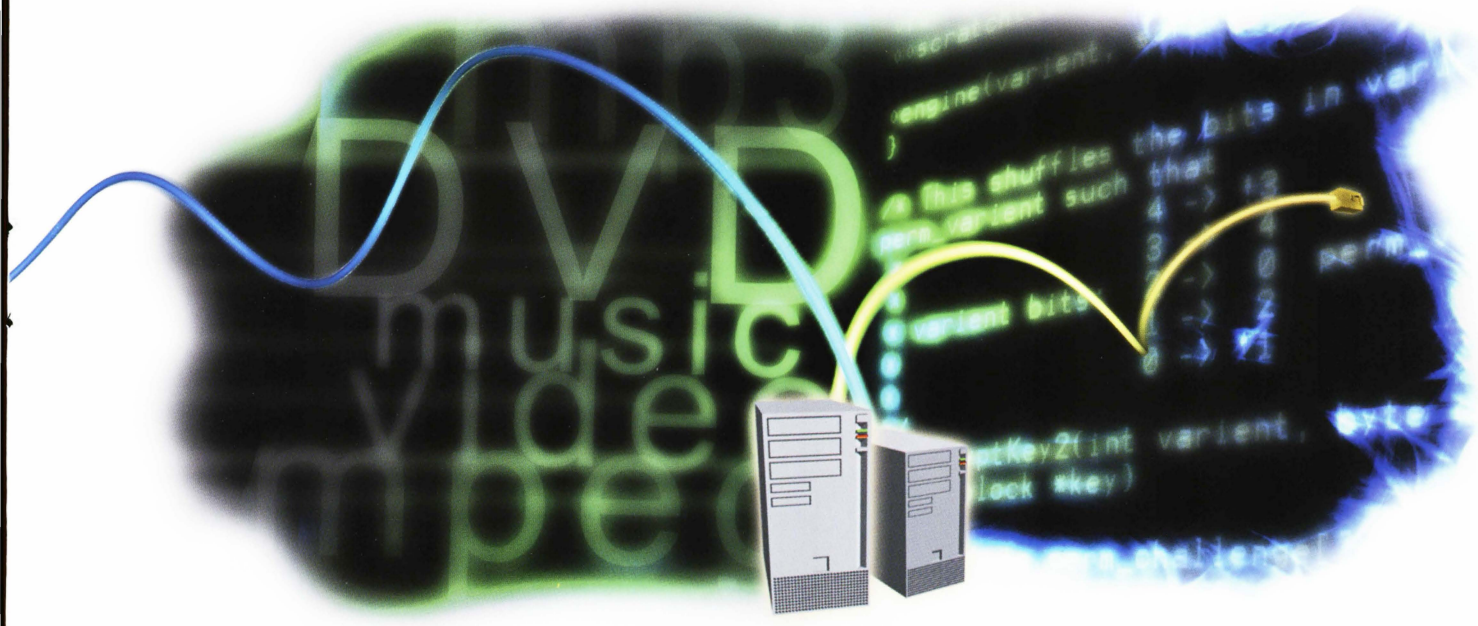
written by Alison Lazarevich
pictures by Brian McGill

In the Digital Age, everyone has come to know the freedom and ease of transferring information online. Pictures, music and all other kinds of media are at our finger tips. However, with the use of the Internet and digital media in general, copyright owners are becoming increasingly concerned with the ease of fraud and the unauthorized distribution of their materials. An example of such a case is the prosecution of the owner and inventor of Napster, an online music exchange medium, lobbied for by the members of the music production community.

On the tail of that incident, Washington has tried to implement legislation that would allow copyright holders to protect their information from illegal distribution. There is currently a bill before Congress that states that "a copyright owner shall not be liable in any criminal or civil action for disabling, interfering with, blocking, diverting, or otherwise impairing the unauthorized distribution, display, performance, or reproduction of his or her copyrighted work on a publicly accessible peer-to-peer file trading network, if such impairment does not, without authorization, alter, delete, or otherwise impair the integrity of any computer file or data residing on the computer of a file trader." For a full text copy of the bill, visit

http://www.politechbot.com/docs/berman.coble.p2p.final.072502.pdf .

So, in essence, a copyright owner such as Time/Warner or Columbia Records can enter computers on public networks, e.g. the Internet, and remove the owner's ability to copy or distribute a file to other members of the public network. For all those avid computer users out there, don't get all hot and bothered yet. There are certain provisions in the bill that must be followed in order for an action to be considered a "legal hack". First off, the hacker can not delete or disable more than $50 worth of information from one person's computer per intrusion. Second, the hacker and the company that employs him/her must file a report with the Justice Department one week prior to the act stating the tools and methods to be used. Third, the company must notify the person whose computer has been accessed as to the name of the copyright owner and why the file was disabled. In addition to these requirements, the bill allows for the affected person to challenge the act by filing a complaint with the Justice Department. And for those of you who don't know, filing a complaint with the Justice Department is much faster than taking the company to court. If it is found by the JD that the file was wrongly disabled,



the company is liable for in excess of $250, depending on the economic loss suffered by the computer's owner. Now, after hearing about all of the stipulations, the bill doesn't sound so bad, or does it?

Take for example the case of a person who has 300 or so MP3s on their computer. Now, one could assume that all of the files were downloaded from illegal sites across the Internet and that all of the music is "stolen". However, what if the person has merely made digital copies of all of their music that they have purchased on CD? Or what if all of the tracks had been purchased at one of the many online MP3 stores? The truth is that there is no way to tell the difference. The MP3 file format does not include information about the purchase status of the file. And this analogy can be extended to other file types such as QuickTime™ movies or MPEG files. The hackers could be disabling an illegal copy of "Saving Private Ryan" or they could be disabling a copy that was digitally recorded off of HBO for later viewing. Now, admittedly, the purpose of this bill is to allow copyright holders to prevent large distributors of cracked software and illegal digital media, but in the past, laws have been used in ways that the writers did not intend.

The following is an exert from the testimony of Bonnie J.K. Richardson, Vice President, Trade & Federal Affairs, Motion Picture Association of America, before the House Commerce Committee Subcommittee on Commerce, Trade & Consumer Protection. "As many of you may already know, the content industries -- movies, television programming, home video, music publishing, computer games and software -- are America's most successful exporters. These copyright-based industries generate more revenues internationally than any other US industry -- more than aircraft, more than agriculture, more than automobiles and auto parts. We also create jobs in the United States at three times the rate of the rest of the economy. As Jack Valenti, President and CEO of the Motion Picture Association of America, is fond of saying, the copyright industries are 'the jewel in America's trade crown'." She goes on to say, "Internet piracy is the single biggest impediment to digital trade today. Piracy of copyrighted materials is not a new problem. In the last quarter century, MPAA and its associated anti-piracy organizations have spent a billion dollars fighting video piracy and signal theft around the world. At present, we have anti-piracy programs in over 80 countries. What is new in the fight against piracy in the Internet era is the speed and ease with which our products can be stolen and distributed illegally over digital networks. Today, Viant (a Boston-based consulting firm) estimates that some 350,000 movies are being downloaded illegally every day. By the end of the year, they estimate

that as many as one million illegal movie downloads will take place every single day. The scale of the problem is unprecedented." While this is only the testimony of one person, the statement illustrates a good point. The Internet and digital file manipulation have made it easier for people to get content they do not pay for and the industry that creates this content has the potential to lose a lot of money because of it. However, the interesting twist in all of this is that those who provide illegal content are not always trying to make a profit, which is why so many Internet users feel that it is wrong to punish the offenders.

Now, one could argue that if files had a signature, a "water mark" of some kind, bills like the one outlined above could more adequately seek out those trying to defraud the copyright industries on a large scale. In fact there is another bill before Congress, called the Consumer Broadband and Digital Television Promotion Act (CBDTPA) that would do just that. The bill, introduced in March of 2002, calls for new technology to be developed and implement that would protect digital copyrighted material. These protections would be included in a broad range of products. The bill states that the protections will be placed in all digital products (hardware and software) that meet the following criteria:

1. Reproduces copyrighted works in digital form.
2. Converts copyrighted works in digital form into a form whereby the images and sounds are visible or audible; or
3. Retrieves or accesses copyrighted works in digital form and transfers or makes available for transfer such works to hardware or software described in subparagraph (B).

This definition covers a very wide range of digital devices including PDAs, laptops, portable MP3 players, and Internet routers. The bill, if passed, would in effect place a monitor in any of these devices that would be capable of many functions including blocking content or reporting back to copyright owners on your activity (the implementation of this function is supported by many copyright holders). Many individuals feel that this is essentially placing a "cop in every computer" that could collect evidence against violators, which could lead to civil action or criminal prosecution. How would you feel if you knew that someone was watching all of your file transfers and reporting back your activity? Would it keep you from transferring any files at all? or just the illegal ones?

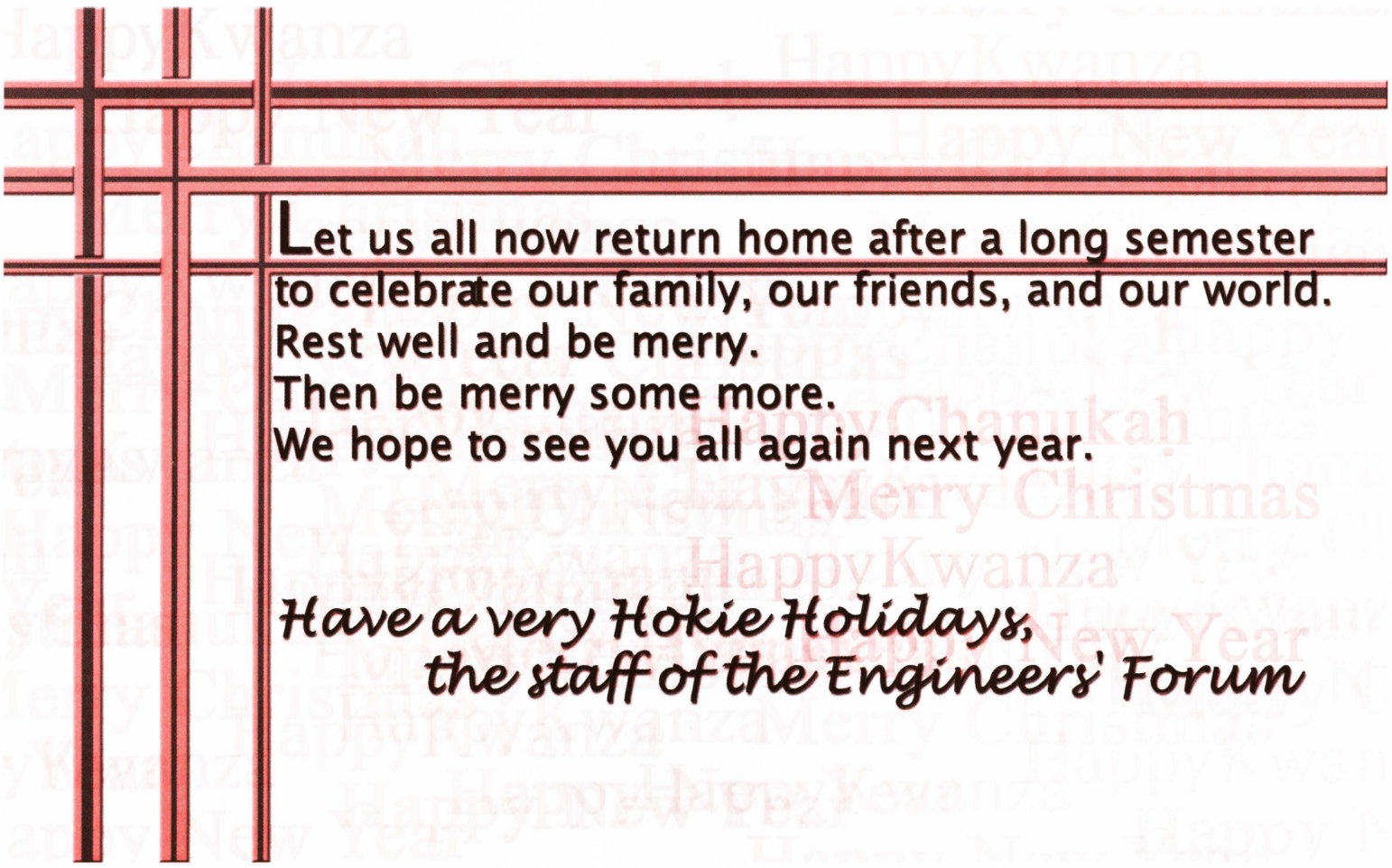
This space intentionally left blank because you weren t here to submit anything for it.

What could you have put here? A witty editorial, an insightful thought, or that perfect picture which would have won the acclaim of thousands? Too bad. Try our next issue by contacting forum@vt.edu or 231-7738. Because a blank page is a terrible thing to waste.

The overlying issue here, which is causing so much hot debate, is the difference between physical and digital privacy, which is far beyond the scope of just the ownership of content. For example, there is no law that says a music production house can enter a building and take material and destroy devices used in the distribution of bootleg CD's. In these cases, the proper authorities have to be notified and the police or other law enforcement agency takes care of the matter. The idea here is that if a person is going to be prosecuted and stopped, their rights must be protected. But this bill, if made a law, would allow copyright owners to take the matter into their own hands. In addition, the bill

makes no statements about criminal prosecution. So, would evidence obtained by a "legal hack" be admissible in a court of law? One would hope not because no subpoena was obtained. But even if the actions made on behalf of copyrighters waived their right to bring criminal or civil charges against the offender, there is a flavor of vigilantly justice attached to these actions. In the case of the CBDTPA, standards could be enacted that would allow companies to spy on any Internet user. However, in the non-digital world, if someone wants to tap your phone, they must produce evidence of a crime or at least demonstrate probably cause for warrant. The CBDTPA would circumvent the right to privacy to serve a higher purpose.

We have to ask ourselves a tough question at this point. Is the protection of those who make money from content more important than a person's privacy? The magnitude of the problem has the copyrighters saying, "Yes, it does." However, many users of the Internet strongly oppose the infringement of their digital privacy. They support methods of digital management such as encryption, which has worked so well for the digital cable and satellite providers, as a protection for content. But, encoding has its problems too. Many of you probably remember the case of the Princeton research team that broke a music encoding scheme and were able to remove a copyright "water mark" and preserve the quality of the file. A paper detailing the research was not published, however, because the researchers faced possible litigation if the results were made public. But, again, this is an issue of personal freedom being placed in opposition with the protection of content. Which is more important, a person's right to privacy and freedom of speech or a person's right to control and protect their ideas and investments? Is the free exchange of ideas more important or is allowing content creators to recoup investments so that they can continue to produce quality goods? In a perfect world, this is an easy choice; we could have both. But, as witnessed by the hot debate about digital copyright infringement, we don't live in a perfect world.



EF Continued from Pg. 9.

develop. We put our alternatives into a decision matrix and chose the best solution by weighting our design criteria. After coming up with a design we all thought would fit well, we started creating an AutoCAD representation. This consisted of a floor plan and exterior model. "It was tough, but designing the church in CAD has really helped me recognize the power of this design program," Nathan pointed out. The end of the semester was approaching, but our group was right on schedule. We held our weekly meetings and documented our daily contributions to the success of the design.

Students surveying the site and looking forward to the future of thier project

It was time to put everything together and decide on how we were going to present our project to the class. Our group decided on a PowerPoint presentation that explained how our church was designed, and why it was best for St. Mary's needs. Together the group practiced the presentation over and over. Then on the last week of classes we presented our finished project and church design to our class just as a group would do for an engineering firm. Our church was a success, and we all felt rewarded for accomplishing our assigned task. Jenn was quoted saying, "All of our work really paid off. It was a great hands-on experience and taught us many lessons about the design process of a real engineering project."

Nathan, another member, said, "This project has allowed me to better understand how an engineer and his peers would interact in solving a given problem." Preston, who created a lot of the AutoCAD design said, "I really impressed myself with how much I learned from working with AutoCAD!" We all left the project with mixed emotions. Some of us were exhausted from the long hours on the computer and others exhausted from putting it all together into the report that was presented. Everyone agreed that Sheila said it best: "We're done and it's the best feeling ever, to think freshman engineers designed a Catholic church to seat 1,400 people, with a bell tower, steeple, and stained glass windows." What an amazing feeling of accomplishment!

E-Mail Bag

The Life of a monkey

A tourist walked into a pet shop and was looking at the animals on display. While he was there, another customer walked in and said to the shopkeeper, "I'll have an AutoCAD monkey please."

The shopkeeper nodded, went over to a cage at the side of the shop and took out a monkey. He fitted a collar and leash, handed it to the customer, saying, "That'll be $5000."

The customer paid and walked out with his monkey.

Startled, the tourist went over to the shopkeeper and said, "That was a very expensive monkey. Most of them are only few hundred dollars. Why did that one cost so much?"

The Shopkeeper answered, "Ah, that monkey can draw in AutoCAD - very fast, clear layouts, no mistakes, well worth the money."

The tourist looked at a monkey in another cage. "That one's even more expensive! $10, 000! What does it do?"

"Oh, that one's a Design monkey; it can design systems, layout projects, mark-up drawings, write specifications, some even calculate. All the really useful stuff," said the shopkeeper.

The tourist looked around for a little longer and saw a third monkey in its own cage. The price tag around its neck read $50,000.

He gasped to the shopkeeper, "That one costs more than all the others put together! What on earth does it do?"

The shopkeeper replied, "Well, I haven't actually seen it do anything, but it says it's an Engineer."

The Way Engineers Think

An Engineering Student, a Physics Student, and a Mathematics student were each given $150 dollars and were told to use that money to find out exactly how tall a particular hotel was.

All three ran off, extremely keen on how to do this. The Physics student went out, purchased some stopwatches, a number of ball bearings, a calculator, and got some friends. He had them all time the drop of ball bearings from the roof, and he then figured out the height from the time it took for the bearings to accelerate from rest until they impacted with the sidewalk.

The Math student waited until the sun was going down, then she took out her protractor, plumb line, measuring tape, and scratch pad, measured the length of the shadow, found the angle the buildings roof made from the ground, and used trigonometry to figure out the height of the building.

These two students bumped into the Engineering student the next day, who was nursing a really bad hangover. When asked what he did to find the height of the building he replied: "Well, I walked up to the bell hop, gave him 10 bucks, asked him how tall the hotel was, and hit the bar inside for happy hour!"

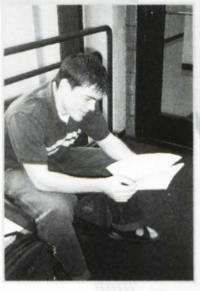
PHOTO SPREAD

Study, Study, Study!

A continuing feature, the photo section introduces VTech student around campus.
This month we tracked down people studying.

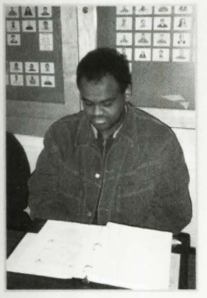
Linh Phan
Year: Sophomore
Major: Biology, soon to be Eng.
Studying: Calculus

Jennifer Masros
Year: Sophomore
Major: Political Science/Econ
Studying: Econ



Erik Neander
Year: Sophomore
Major: Mechanical Engineering
Studying: Statics

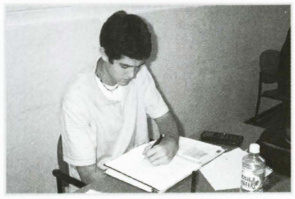
Casey Liss
Year: Junior
Major: Computer Engineering
Studying: Orbital Mechanics



Desta Alemayehuae
Year: Junior
Major: Aerospace Engineering
Studying: Intro to AE

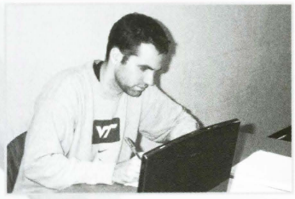
Caroline Tabb
Year: Sophomore
Major: Marketing
Studying: Accounting

Justin McFarland
Year: Sophomore
Major: Biology
Studying: Psychology

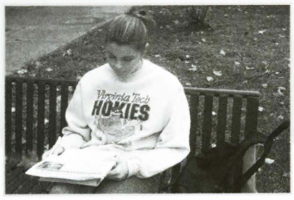


Levi Bracken
Year: Sophomore
Major: Computer Science
Studying: Multivar

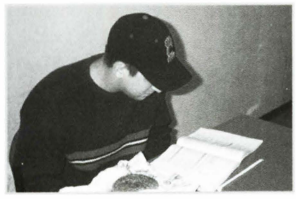
Leslie Baynes
Year: Junior
Major: Mechanical Engineering
Studying: Fluids



Kevin Schoonover
Year: 1st year Grad
Major: Electrical Engineering
Studying: Grading papers for
Intro to Computer Engineering



Victoria Miller
Year: Sophomore
Major: Biology
Studying: Psychology



Robert Barkanic
Year: Sophomore
Major: Political Science
Studying: Music Appreciation

Editor's Letter

written by Michael Carr

What would you do if someone gave you a million dollars? Or better yet, a hundred million dollars. What would you do if suddenly you never had to worry about money?Buy the car, the house, or whatever. Sure, fine. But then what would you do for the rest of your life? Not everyone can be like our collective friend Peter and do absolutely nothing. For a little while it would be nice to sit around, enjoy the smell of the air, eat, sleep, etc. To do it for the rest of your life would take tremendous stamina.

So what do you do? Personally, I would get a job doing exactly what I am studying to do. It might sound funny to some, but I genuinely enjoy my field. Frankly I can't really see myself doing many things. Well, except perhaps doing this entire magazine thing.

When I got into school the vision of what I wanted to do wasn't so clear. Eventually, with a little experience, I discovered what it is I want to do for the rest of my life. Through a little finagling I got into the right curriculum and the right activities to help me make sure my ideal future job was in my reach.

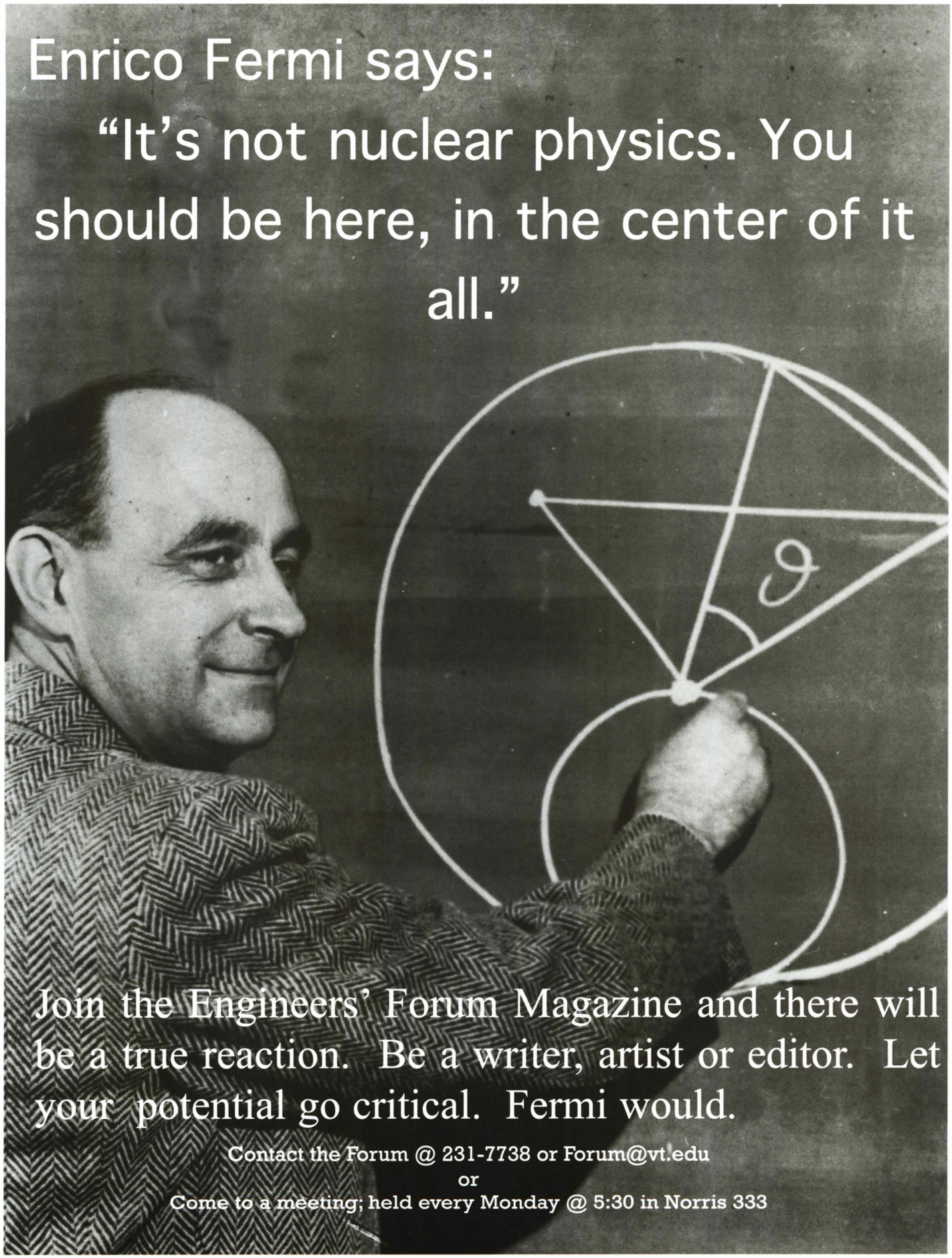
Now that the job search is on I am looking at places I would love to work. Many of the places I am looking at are top-notch, for my interest, but the pay is on the bottom end of the scale. And you know what that doesn't bother me at all.
How silly does that sound? All I want is the cool job, and they could pay me in food and rent money. And I'm an engineer, where average starting salaries are in the high forties.

Thing about it for a second and it makes a bit more sense. Baring any major problems I will be working for the next forty years. Now ask yourself, would this guy like to have fun and enjoy what he does most days of the week?

You probably answered yes, for good reason. Now ask yourself that question. Then think about what you are studying. Is what you are studying to do what you want to for 48 weeks a year for the next forty years? I would hope it is, for your sake.

Do what you want to do, and start doing it now. While you may not win the lottery today, you should be happy in your life. Why work at that miserable job, killing yourself? Yes, being able to justify away the shiny red sports car as a midlife crisis buy is nice. Being able to better enjoy life everyday is the far superior reward. Be happy in what you do, and who knows, maybe you will win the lottery. Good karma always helps though.

Michael Carr
Editor-in-Chief


Enrico Fermi says:
"It's not nuclear physics. You should be here, in the center of it all."
Join the Engineers' Forum Magazine and there will be a true reaction. Be a writer, artist or editor. Let your potential go critical. Fermi would.
Contact the Forum @ 231-7738 or Forum@vt.edu
or
Come to a meeting; held every Monday @ 5:30 in Norris 333