



Engineers' Forum

Volume 25 No. 3 September 2006

Simple,



or not?

THE ART OF SIMPLICITY

**A BRIEF LOOK INTO MOBILE
PHONE TECHNOLOGY**

**DR. KRAFT TO PRESENT MOON
ROCK TO VIRGINIA TECH**



Think Big and Build from There.

Oshkosh Truck Corporation designs and builds the toughest, most reliable, most technologically advanced trucks in the world. These vehicles have to perform in extreme conditions and face the toughest terrain on the planet. Our employees are the real power behind Oshkosh vehicles, and we're looking for engineers who are ready for this kind of challenge. If you've got big ideas and stand by them, then we invite you to join us on campus.

Please contact career services for dates Oshkosh Truck Corporation will be on campus in the Fall.

MECHANICAL ENGINEERS - FULL TIME & INTERNS/CO-OP

ELECTRICAL ENGINEERS - FULL TIME & INTERNS/CO-OP

INDUSTRIAL/MANUFACTURING ENGINEERS - FULL TIME & INTERNS/CO-OP

For more specific information and to apply, please visit our website at:

www.oshkoshtruckcorporation.com



Oshkosh Truck Corporation and its subsidiary companies offer competitive salaries, an excellent benefits program, and opportunities for ongoing training and growth. We are an Equal Opportunity Employer. Women and minorities are encouraged to apply.

Editor-in-Chief

Divakar Mehta

Managing Editor

Kari Adkins

Business Manager

Robert Ridgell

Layout and Design

Naren Sundaravaradan

Distribution Manager

Charlie Crawford

Webmaster

Mark Everett

Writers

Kari Adkins

Liz Crumbley

Divakar Mehta

Lynn Nystrom

Editorial Advising Committee

Lynn Nystrom

Director of News and External Relations for the
College of Engineering

Engineers' Forum is Virginia Tech's student-run engineering magazine. Engineers' Forum is published four times during the academic year. The editorial and business office is located at:

223 Femoyer Hall

Virginia Tech

Blacksburg, VA 24061

Phone: 540-231-7738

Email: forum@vt.edu

URL: <http://www.ef.org.vt.edu>

Member of Engineering College Magazine Associated, Mike Dorsey, Chairperson. The opinions expressed in the Engineers' Forum do not necessarily reflect those of the administration, faculty, or student body of Virginia Tech. Copyright 2005 Engineers' Forum. All right reserved. Reproduction in whole or in part without permission is prohibited.

Printed in the USA.

From The Editor

Dear Reader,

Welcome to yet another issue of the Forum! As the new academic year commences, I would like to welcome all incoming students into the VT community. The next four years are going to be the best of your life, but do remember to keep the balance between work and fun; the rest will just piece together on its own.

For decades now, the Forum has been the voice of VT engineers, always bringing you VT engineering news and other stories. As a part of our quest for change, we would like to introduce some new features into the magazine. Don't be alarmed, however, because everything else is the same as before. In the next few issues, you will notice some changes and additions. Starting from this issue, we have modified our cover page a little bit, to make it more consistent and organized. We would be delighted to hear what you think about these changes, so feel free to drop us a line. I hope you enjoy this issue.

Respectfully,



Divakar Mehta
Editor-in-Chief
Engineers's Forum Magazine



Inside

Page 4

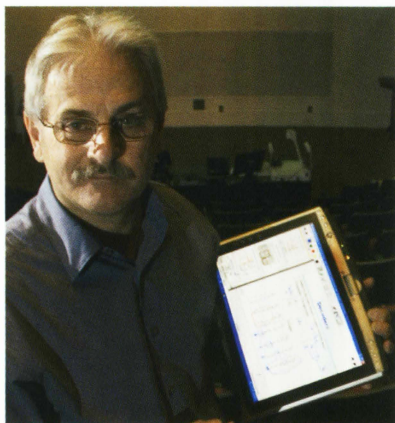
Virginia Tech engineering students win autonomous vehicle competition for third year

- Liz Crumbley

Page 5

College of Engineering announces alliance with Fujitsu and Microsoft

- Lynn Nystrom



Page 9

The Art of Simplicity

- Divakar Mehta

Page 13

Virginia Tech engineering students catch top prizes at ASME competition

- Liz Crumbley

Page 14

Engineering students win Challenge X competition with ethanol-powered SUV

- Liz Crumbley



Page 17

A brief look into mobile phone technology

- Kari Adkins

Page 21

Chris Kraft to Present Moon Rock to Virginia Tech's Engineering College

Looking for a company with
opportunity, integrity &
excitement?



One that offers challenging career growth and a proven track record?

Consider the **Danaher** team. Danaher is a \$4B Fortune 500 corporation with more than 50 companies worldwide including Fluke Instruments and Craftsman Tools. Danaher Motion, with operations in Radford, VA., is a leading manufacturer in electronic motion control products and solutions.

Visit DanaherMotion.com or Danaher.com to learn more about our company. We offer competitive compensation, excellent benefits and the opportunity to make significant contribution to the growth of the company.

DanaherMotion

Kollmorgen • Pacific Scientific • Superior Electric
www.DanaherMotion.com

Equal Opportunity Employer, M/F/D/V

Tindall

Better Building Through Technology

Opportunities

Tindall Corporation is one of the nation's largest privately owned manufacturer of precast/prestressed concrete building systems.

The following positions are available:

*Civil Engineers • Industrial Engineers • Structural Engineers
Construction Engineering & Management*

*For a challenging and exciting career contact us at:
864/576-3230, Fax 864/587-8828, Email hr@tindallcorp.com
Visit us on the web at www.tindallcorp.com*

E.O.E.

Our People Make the Difference?
Can You?

Do you want make a difference in your life and community?

Anderson & Associates has many opportunities currently available for all levels of employment including:

Civil Engineering - Surveying - Landscape Architecture - GIS

www.andassoc.com
careers@andassoc.com

innovative.
engineering.
solutions.

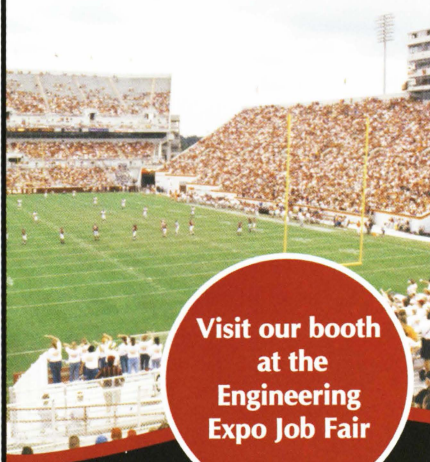
Blacksburg, VA Middletown, VA Fredericksburg, VA Johnson City, TN Greensboro, NC



Draper Aden Associates

Engineering • Surveying • Environmental Services

Blacksburg • Charlottesville • Hampton Roads • Richmond, Virginia
www.daa.com



Visit our booth
at the
Engineering
Expo Job Fair

You've seen our work on campus...
now see what you can do
as part of our team.

If you want to join one of Virginia's premier
employee-focused engineering firms, send your
resume now to tquinn@daa.com.

We clean more than Virginia Tech's uniforms, wiping towels and floor mats.

Coyne Textile Services leads the way in environmentally-friendly cleaning processes that meet EPA's reuse and recycle objectives. One more way Coyne provides extra value for your uniform rental and building services dollar.

- Uniforms for rent or purchase
- Protective apparel for rent or purchase
- Reusable absorbent products (RAS)
- Floor mats and anti-fatigue mats
- Wet mops and dust mops
- Shop and printer towels
- Restroom hygiene products
- Restaurant services



COYNE TEXTILE SERVICES

1-800-MR-COYNE

www.coynetextileservices.com

Virginia Tech Engineering Students Win Autonomous Vehicle Competition For Third Year

By Liz Crumbley

For the third year in a row, the Virginia Tech Autonomous Vehicle Team swept the international Intelligent Ground Vehicle Competition (IGVC), winning best and second-best overall and placing first in the three top event categories. The team

Charles Reinholtz, Alumni Distinguished Professor, and professor Alfred Wicks. Much of the design and construction of the vehicles was directed by graduate students Andrew Bacha of Reston, Va.; Ruel Faruque of Charlottesville, Va.; and Brett Gombar of Montclair, Va.

are judged on design innovations.

The Virginia Tech team equipped their vehicles — “Chimera,” “Gemini” and “Johnny-5” — with computers and navigational sensors, including digital cameras, digital compasses, GPS and scanning laser range finders. The vehicles differ in body construction, power sources, and operational variations that the team implemented in the on-board computer software.

Gemini placed best overall in the 2006 IGVC — repeating its first-place performance from the 2005 competition — and also won the Autonomous Challenge. Johnny-5, which best placed overall in 2004, came in second place overall for 2006 and won the Navigation Challenge. Chimera, a new vehicle built during the past academic year, placed first in the Design Competition.

The Virginia Tech team also won prizes for implementing a new software standard for unmanned systems and for implementing the ability to point to a target at the end of a navigation run.

The IGVC is supported by a number of sponsors, including the Association for Unmanned Vehicle Systems International, U.S. Department of Defense, Society of Automotive Engineers, and General Motors.



IGVC Team along with their vehicles

of mechanical engineering (ME) students also was awarded \$15,000 in prize money.

The Virginia Tech team entered three of the 40 autonomous vehicles that competed in this year's IGVC, which took place in June at the Selfridge Air National Guard Base in Harrison Township, Mich. Thirty-three universities in the U.S. and other countries were represented at the event.

The Virginia Tech students were guided by ME faculty advisers

Three team members graduated from Virginia Tech in May with bachelor's degrees in ME: Ben Amar of Pembroke, N.H.; Randy Depoo of Herndon, Va.; and Ryan Tenga of Fairfax, Va. Graduate student Jon Weekly of Cincinnati, Ohio, and senior Peter King of Alexandria, Va., also participated in the competition.

During the IGVC, autonomous vehicles use on-board computer and navigational technologies to navigate obstacle courses and point-to-point destination courses without human intervention. The entries also

College of Engineering Announces Alliance With Fujitsu and Microsoft

By Lynn Nystrom

A few months back, the College of Engineering announced an industry alliance with Fujitsu Computer Systems Corporation and Microsoft Corp. to support its new Tablet PC computing initiative for incoming freshmen.

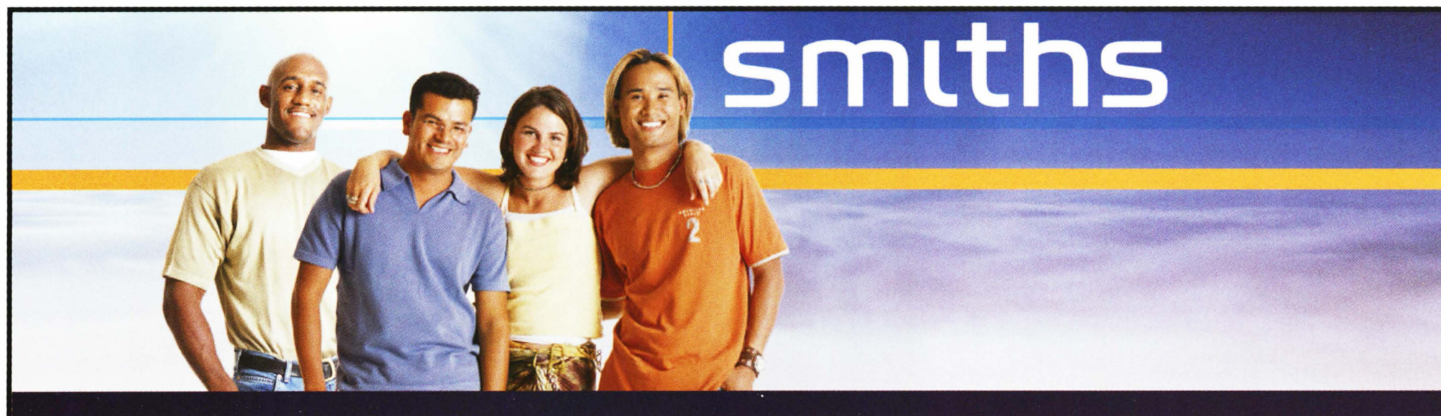
The alliance between Fujitsu, Microsoft, and Virginia Tech will offer engineering students high levels of hardware and software purchasing power and support, and will also provide students, faculty, and staff with training and assistance throughout the development and implementation of new models of teaching and learning.

The Fujitsu LifeBook® T4000 Se-

ries convertible Tablet PC combines the convenience and familiarity of a notebook with the powerful and versatile functionality of a slate Tablet PC. In conventional notebook mode, the Tablet PC offers a keyboard for typing. By rotating and folding the screen it transforms into a tablet configuration. Using a stylus, students can make handwritten notes and drawings in a manner comparable to the way in which pen and paper are used. The LifeBook T4000 Series convertible Tablet PC offers a bright 12.1" display with greater than 160° viewing angles. It is the only convertible Tablet PC on the market with a built-in modular bay that supports an optical drive or second battery for those extra long school days.

"We selected the Fujitsu LifeBook T4000 Series convertible Tablet PC based on its reliability and flexibility, as well as the company's ability to support learning experiences in or outside of the classroom," said Glenda Scales, associate dean for computing and distance learning, College of Engineering at Virginia Tech. "In our deliberations, we also balanced price, weight, service, screen size and years of corporate experience with Tablet PCs. While several vendors met our minimum computer requirements and were strong in a particular area, by selecting Fujitsu hardware we were able to meet the majority of our educational requirements for a Tablet PC."

"In the first year engineering courses, students will use their Tablet PC



Depart from the Average Career.

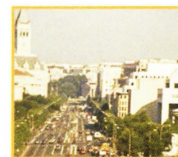
Smiths Aerospace, known for pushing the envelope with exciting new initiatives and special projects like the CCS for the Boeing 787, is a leading global provider of innovative solutions for civil and military aircraft worldwide. In addition to the Boeing 787, current projects in development include next generation technology for UAVs. We seek a broad range of technical experts to join our team in Grand Rapids, MI, Clearwater, FL and Germantown, MD.

Smiths, where you'll enjoy a competitive salary and generous benefits, is a highly renowned designer and manufacturer of advanced avionics systems for military and civil aircraft worldwide. We're offering what you're looking for...a chance to create, advance, learn and enjoy life.

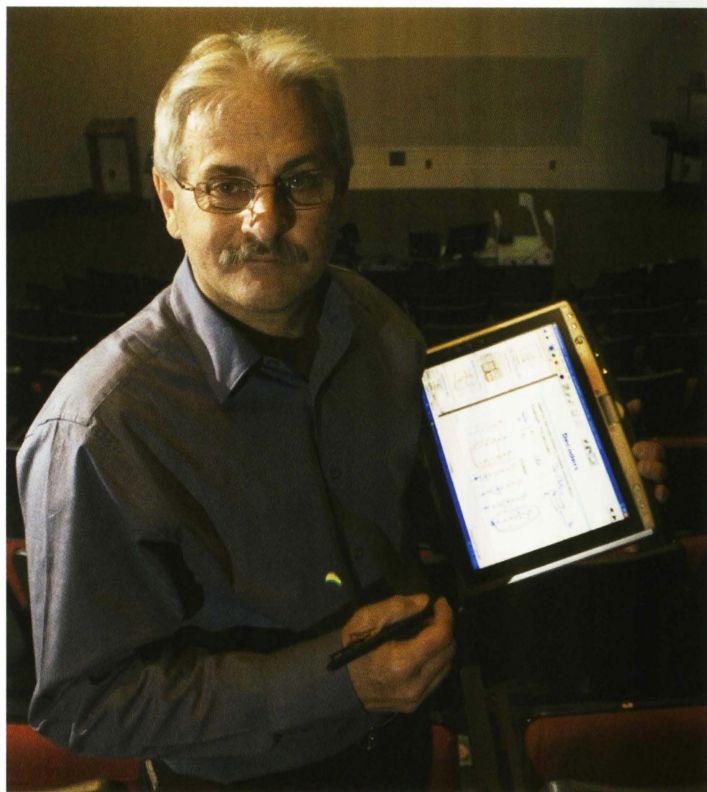
To learn more about our growing company and our current employment opportunities, please visit our website at:

www.smithsjobs.com

Smiths Aerospace is an EOE promoting diversity in the workplace. For security reasons, most positions require applicants meet certain eligibility requirements, including US citizenship or permanent alien status.



to literally sketch their designs on their computers instead of using a mouse that links to drop down menus. Additionally, students will create an electronic lab book where they will have the flexibility to include handwritten notes as well as collaborate with each other electronically," said Tom Walker, professor of engineering education (EngE).



Professor Joe Tront from the department of Electrical & Computer Engineering with a Tablet PC

Faculty will use applications such as Microsoft Office OneNote, Classroom Presenter, and SketchUp in support of the first year curriculum changes.

Beyond the freshman year, students will use Tablet PCs to actively participate in classroom presentations and exercises by drawing responses to queries and sending them to the instructor for public display and further discussion. "The ability to receive a copy of the instructor's notes, including in-class electronic ink annotations, and to add personal notes gives the student a very powerful tool for both classroom participation and after class study," said Joe Tront, professor of electrical and computer engineering (ECE). For the past two years, Tront has been working with groups of 15 to 20 students who use Tablet PCs in his ECE classes.

This summer, Virginia Tech piloted faculty and student
Engineers's Forum • September 2006 • Page 6



**Building Careers...
Building Infrastructure...
Building Intelligence**

Work Locations Include:

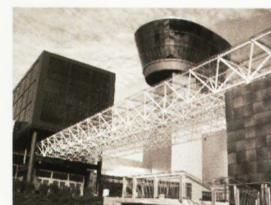
- Dulles, Virginia
- Atlanta, Georgia
- Tampa / Clearwater, Florida
- Stuttgart, Germany
- Orlando, Florida
- Richmond, Virginia

Seeking Qualified Individuals for:

Electrical Engineer and Estimator
Electronic Security Engineer, Technician, Superintendent
Network Design Engineer
Satellite / Telecom Engineer

22461 Shaw Road, Dulles, Virginia 20166
P. O. Box 1278, Sterling, Virginia 20167
Telephone: 1-800-7-MCDEAN Facsimile: 703-421-2348

www.mcdean.com/careers/fig02-09
and click on 'Open Positions'



M.C. Dean, Inc. is an equal opportunity employer M/F/D/V

We Give You
the **Power**
To Succeed

MILLER ELECTRIC
COMPANY



904.388.8000
www.mecojax.com

MILLER ELECTRIC COMPANY
"QUALITY SERVICE SINCE 1928"

Commercial • Industrial • Institutional • Teledata Networks • Highways & Bridges
Jacksonville, FL • Miami, FL • Tampa, FL • Atlanta, GA • Charlotte, NC • Washington, DC

use of Tablet PCs in coordination with the College of Engineering's student transition program. This National Science Foundation sponsored program provides students an opportunity to become familiar with the Virginia Tech university community prior to the start of their academic career.

"Our goal with this pilot is to help our students see the full capabilities of the machines, and we hope that the Tablet PCs will facilitate the collaborative efforts required of these students through their academic years and beyond," said Jean Kampe, also a member of Virginia Tech's Department of Engineering Education faculty.

Virginia Tech's alliance with Fujitsu and Microsoft enabled Virginia Tech to provide specific training for faculty on the use of the Tablet PC

technology in the classroom during the summer months. With Fujitsu and Microsoft's assistance, Virginia Tech's Faculty Development Institute (FDI) worked on developing models by which to train professors and graduate students on the technology and pedagogical techniques of using these new tools specifically in an engineering learning environment. These models can be disseminated to other schools as they implement Tablet PC technology locally.

"We will work with education researchers at Virginia Tech on the use of the Tablet PC in order to investigate the longer term pedagogical implications of using this technology," Scales added. "We have a three-year implementation plan for this initiative. Since the Summer of 2006, we have been working to engage with Engineering Education faculty to develop exciting pedagog-

ical models for their classrooms. We expect to offer this opportunity to additional faculty each summer as they begin to think about new ways Tablet PCs can help them facilitate learning."

With this decision, Virginia Tech becomes the largest and first public college of engineering to require the Tablet PCs for the engineering freshmen. This announcement follows a number of firsts by Virginia Tech's College of Engineering in the area of personal computing.

In 1984, the college was the first public institution in the U.S. to require its entering engineering freshmen to own a personal computer. In 2002, the college moved to a laptop requirement and many of its academic buildings were outfitted to offer wireless communication capabilities.

Examine the Possibilities

FORWARD
THINKING



UNITED STATES PATENT AND TRADEMARK OFFICE

Stand at the center of scientific and technological progress at the United States Patent and Trademark Office, securing exclusive rights for inventors over their discoveries worldwide. The United States Patent and Trademark Office continues to experience significant growth in the filing of patent applications, which translates into immediate opportunities for engineers and scientists to become Patent Examiners.

Patent Examiners

As a Patent Examiner, you will analyze patent applications using your specialized engineering knowledge and technical research skills to evaluate concepts and designs. Your responsibilities will involve determining the acceptability of patent protection, while meeting weekly performance goals. You must possess a BS or advanced degree in engineering or science, technical competence in the area for which you are hired, and strong oral and written communications skills to be successful.

Electrical and computer engineers may be eligible for a recruitment incentive of up to \$9,900 per year for a maximum of four years. A service agreement will be required.

Now Hiring — Immediate Openings

Visit our website at www.USPTOcareers.gov to learn more about how your engineering skills can help keep American ingenuity on the cutting edge.

Examine your career possibilities. Our excellent benefits include enhanced federal salary rates, flextime schedules, health coverage, vacation and sick leave, law school tuition reimbursement and more. US citizenship is required. Equal Opportunity Employer.



Please visit our website at:
www.USPTOcareers.gov

"With our decision to move to Tablet PCs, our College of Engineering continues to be a leader in technology for engineering education," said Richard Benson, dean of the College of Engineering. "The overall engineering community will benefit from the scientific studies of the effectiveness of this program."

In the most recent (2004) survey of the Engineering Workforce Commission of the American Association of Engineering Societies, Inc., the Virginia Tech College of Engineering ranks eighth nationally for the number of undergraduate degrees awarded. "America's Best Colleges 2006" survey, released by U.S. News & World Report in August 2005, ranks Virginia Tech's College of Engineering's undergraduate program 14th in the nation among all accredited engineering schools that offer doctorates, and eighth at public universities.

LifeBook is a trademark or registered trademark of Fujitsu Limited in the United States and other countries. The names of actual companies and products mentioned herein may be the trademarks of their respective owners.

JOIN THE ENGINEERS' FORUM TEAM

forum@vt.edu

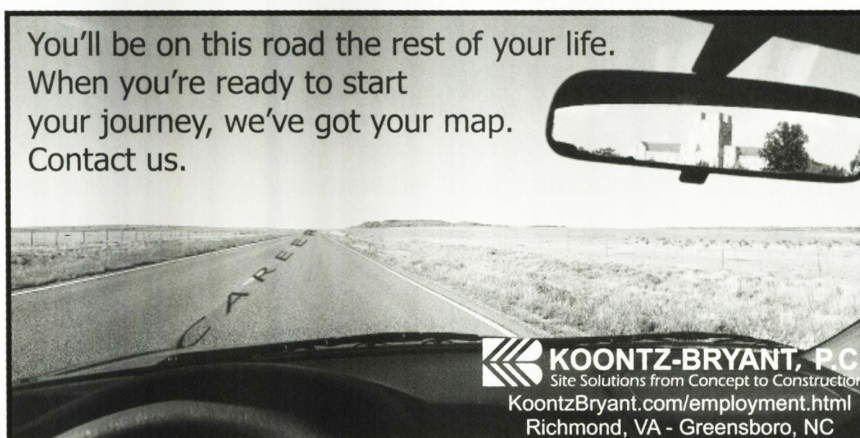
Boone Tractor

Quality & Integrity Since 1984

1111 East Main Street
Bedford, VA 24523
Phone: 540-586-2134
Fax: 540-586-9531

www.boonetractor.com

You'll be on this road the rest of your life.
When you're ready to start
your journey, we've got your map.
Contact us.



Creating success with Virginia Tech graduates.



S&ME

Offices throughout the Southeast
smeinc.com

*A proud sponsor of the 2006 Engineering Expo.
Stop by our booth to find out more about careers with us.*



Vanasse Hangen Brustlin, Inc.

VHB is nationally recognized for the quality of our work on a wide range of projects in transportation, land development & environmental services. We have 16 east coast office locations, including those in Vienna, Richmond, Williamsburg, Newport News, & Virginia Beach, VA. We are a generational company & operate on the belief that a key responsibility of ownership is to pass a healthy, growing enterprise on to the next generation. VHB offers a great working environment, competitive salary/benefits & outstanding professional & personal development programs.

**Co-Op, Internship, Full & Part time positions available.
Please visit www.vhb.com for more information.**

EE0/AA



The art of simplicity



By Divakar Mehta

What exactly is the meaning of this word simple? Oxford University Press defines it as “easily understood or done, plain and uncomplicated in form, nature, or design” along with other definitions pertaining to other scenarios. In recent years, many of us have forgotten about simplicity. Popular culture and media have made it hip and cool to lead complicated lives. This complication has penetrated into every facet of our life ranging from the way we speak to the things we use.

Turn on any radio or television and you will immediately notice the newscasters picking the most pre-

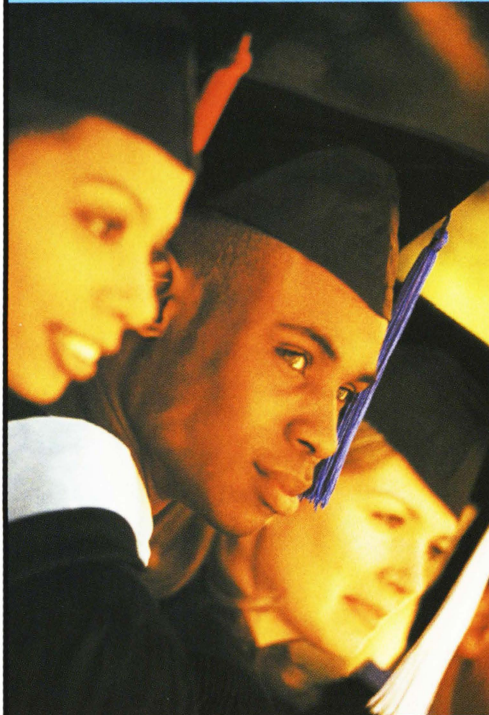
tentious word they can find, so that they can come off as erudite. Similarly, visit any Best Buy or Circuit City around the country and many of the gadgets being sold are as far from “easily understood, plain and uncomplicated” as possible. Let’s pick an example: a modern cordless phone vs. an old rotary phone. Many of us have probably never owned a rotary phone, but the phone was composed of a dial and just a few other things that were essential to making (or receiving) phone calls, that’s it.

A modern cordless phone on the other hand is covered with buttons from one end to another. When was the last time you used the button la-

beled “flash” on your phone. I am an engineering student who loves gadgets, yet I do not have a clue as to why that button exists. I am still able to make and get calls, which was the ultimate reason behind buying the phone. So why does all of this matter? Today’s designers are more concerned with putting all the latest features into their products, than making sure that their product meets its main purpose.

A Deeper Look

Over complication of products can also end up costing designers negatively. The majority of the people around the world already have too many problems to deal with, so a



What now?

With commencement looming in your future, you probably have the same question on your mind that’s been nagging impending college graduates for years: “What now?”

SWIFT wants to help you answer that question.

After all, it’s the creativity and modern resources of new professionals like you that have allowed SWIFT, **Society for Worldwide Interbank Financial Telecommunication**, to expand to a global community of 7,650 financial institutions in over 200 countries. Our vision is to be the global financial community’s foremost messaging infrastructure with the lowest risk and highest resilience, and we invite you to help us make that mission statement a reality.

Whether you’ve just completed a degree in Computer Science or Engineering, SWIFT has a position to match your ambitions. Bring your talents to any one of our careers and we’ll offer you a world of potential, because when it comes to your future and advancement with SWIFT, it’s not just about asking yourself, “What now?”—it’s also about asking, “What next?”

To learn more about SWIFT or apply, please browse the “Careers at SWIFT” pages on www.swift.com and submit your resume via our website for technical positions in Northern Virginia.

SWIFT is an equal opportunity employer.



complicated product is not what they want to add to their daily to-do list. There are numerous examples of extremely simple products becoming great successes. For example, many experts feel that one of the biggest reasons behind the iPod success is its simplicity. The iPod, when compared to other MP3 players manufactured by companies such as Creative or Toshiba falls



The Apple iPod™ mp3 player

short in many features, however, it is still able to outsell the other players, simply because people find the wheel intuitive and can pick the player up and start jamming in a few seconds. Additionally, Apple made it possible for customers to download music with iTunes, a player that is equally simple and easy to use.

Another not so visible example of complication is the change in society. Like it or not, the world has changed. It is not the same as it used to be. Gone are the days when people used to simply sit and talk at the neighboring grocery store. Today, the daily life has become so complicated that most of us cannot fathom standing around and talking for a few minutes.

Grocery stores have become a racetrack with people trying to get in and out as soon as possible. Grocers also feed this fire for speed by coming up with solutions such as self-checkout, which by the way is another gadget thrown in to the mix. As a society, we spend so much time with gadgets that it has started taking over our lives. Stress has become an integral part of every-



EAGLE FIRE

Your Fire Protection Company

- Sprinkler Systems
- Testing & Inspection of Fire Protection Systems
- Fire Suppression Systems
- Fire Pump Testing
- Alarm & Detection Systems
- Access Control Systems

EAGLE FIRE INC.

7459 White Pine Road
Richmond, VA 23237

(804) 743-2500

**For career opportunities visit our website
and fill out an on-line application!**

www.eaglefire.com

DCJS VA-11-2841
NC-1210 CSA
SC-Q490





ENVISIONING • CREATING • ACHIEVING



Timmons Group is a Richmond, Virginia based full-service engineering firm with more than 325 employees and offices located throughout the Mid-Atlantic.

- Site Development Design & Engineering • Land Planning & Landscape Architecture • Geographic Information Systems
- Economic Development • Transportation Studies & Roadway Design • Geotechnical Engineering & Materials Testing
- Infrastructure Management • Environmental Services



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS.

www.timmons.com

Site Development
Residential
Infrastructure
Technology

body's life. As a society, there is so much stress that problems like insomnia are becoming a disease.

A book published by the United Nations University titled "Women Encounter Technology: Changing Patterns of Employment in the Third World" found that "inputting or manipulating text or data using a visual display unit (VDU) or visual display terminal (VDT)" leads to many problems including insomnia. A VDU or VDT is nothing but a computer with a monitor and keyboard. All the blame can obviously not be placed on complicated devices, but it is a big contributing factor.

The average Joe is so concerned with trivial issues that could be reduced greatly by simplifying lifestyles. The answer designers came up for this problem is multi-tasking. All of a sudden, multi-tasking

became trendy and product manufacturers churned out products that could supposedly do everything. A few years ago, printer manufacturers came up with the idea that one machine should fax, copy, scan, and print. The result: a product that was either plagued with constant technical issues or unhappy customers that found the product hard to use. The lesson here again was creation of more problems than results.

Another big issue arising from complicated products is that they can end up costing the planet more than simple products. The amount of wiring and circuitry inside the rotary phone, mentioned earlier, is negligible, when compared to a cordless phone. The chemicals, metals, and plastics used to manufacture such products are not nature friendly. After disposal, many of these products cannot be composted and are there-

fore land filled and the rate at which the world population is growing, this will become a big problem very soon.

The Path Towards a Solution

There are companies around the world that do believe in simplicity of design. Bose is a company that has been long known for manufacturing well-researched sound solutions. At the same time, the company is known for its simplicity in design and packaging. Rather than packing their products in the most appealing boxes with product manuals that look more like a marketing campaign, they usually come in simple boxes with austere product manuals.

Headphones that cost a few hundred dollars come packed in a box that is as simple as a box could be. Does this mean that they lose business?



Armament Research, Development & Engineering Center Picatinny Arsenal, New Jersey



A leader in research and development for armaments and munitions, the U.S. Army Armament Research Development & Engineering Center located at Picatinny Arsenal, NJ, is seeking current college seniors or recent college graduates in the following career fields:

**Computer Science/Engineering
Electronics/Electrical Engineering**

**Chemist/Chemical Engineering
Mechanical Engineering**

We offer competitive starting salaries and signing bonus with increased responsibility and rapid advancement opportunities, a comprehensive benefits package including health and life insurance, 401K equivalent and professional development with tuition assistance. Quality of life programs include flexible work hours, health services and child care, recreation and fitness facilities. Picatinny Arsenal is located off Route I-80 in Northern New Jersey, approximately 40 miles west of New York City. Resume's may be forwarded or faxed to:

Professional Recruiter
Building 151
Picatinny Arsenal, New Jersey 07806-5000
Fax No. 973-724-3436

For more information visit our Web address: www.pica.army.mil

No! They are promising only one thing when you buy their products: better sound. The problem therefore is that many designers are unable to answer the reason behind their design. The frills needed to sell the product outweigh the performance of the product.

Virginia Tech (VT), a renowned engineering school is known to have produced many respectable engineers, however, I believe that the subject of simplicity could use more focus at VT and all other schools around the world. Before beginning the design of any product, the first question the designer should ask himself/herself is: What will this product do? Once this question has been answered, the next step should be to solely design the product to achieve that function.

After thorough testing and confirmation that the product achieves its goal, the designers can start including other features that will add to the functionality and make the product better. Hopefully we will not end up as a society that has lost its human touch due to over complication.

Anything in excess is not beneficial. Many problems facing modern society can be dealt with effectively by simplifying. There is no reason to be accessible all the time. Try leaving your cell phones at home, the next time you arrive at a dinner table to dine with your family or friends and see how fulfilling the conversation will be without a phone ringing every few minutes.

Wilson Miller

New Directions In Planning, Design & Engineering

4571 Colonial Boulevard, Suite 100

Fort Myers, FL 33912

Tel: 239-939-1020

Fax: 239-939-7479

www.wilsonmiller.com



SI
INTERNATIONAL

Patent Classifiers Needed!

SI International, a 4,400 person IT company serving the Federal Government, is currently searching for applicants to fill numerous Patent Classifier positions in Harrisonburg, VA. These will be full time positions and include all company benefits and the possibility to earn bonuses based on performance. *SI International* is recruiting for over 100 positions to perform review, examination and research functions in order to classify patent applications submitted by individuals with inventions. *SI International* employees will be the first to review all the latest inventions in the United States. We are looking for applicants with a Bachelor's degree from an accredited university. It is preferred that individuals have experience or a degree in areas such as engineering, technology, science or some other technical field.

Salary Range for Patent Classifiers: \$34-39K

All interested applicants should apply online at www.si-intl.com.

Please contact Jamie Calcagno at 540-437-3241 with any questions.

Applicant selected may be subject to a government security investigation and must meet eligibility requirements for access to classified information. EOE M/F/D/V

Ready for Your Next Challenge?



Are you driven by challenge? Are you seeking long-term career opportunities with the flexibility to develop diverse skill sets, while working on signature engineering projects? Are you looking for ways to apply your technical knowledge in a forward-looking, technology-driven organization? Baker, a leading engineering and energy services company, can provide that challenge and the opportunities you are looking for.

Baker offers a competitive salary and benefits package including 401k, holiday/vacation, medical, dental, vision, and much more.

We view challenges as invitations to innovate.

Baker

ChallengeUs.

Michael Baker Jr., Inc.

Alexandria • Manassas • Richmond • Virginia Beach • Winchester
1.800.553.1153 • www.mbakercorp.com

Baker is an EOE Drug Free workplace.

Virginia Tech Engineering Students Catch Top Prizes at ASME Competition

By Liz Crumbley

The Virginia Tech chapter of the American Society of Mechanical Engineers (ASME) carried away several top awards—including one for the design of a fishing apparatus for a quadriplegic—during the recent District F student conference hosted by the University of Tennessee.

The Virginia Tech undergraduate mechanical engineering (ME) students, under the guidance of their long-time faculty adviser Charles Reinholtz, an Alumni Distinguished Professor of ME, won first place in seven out of the eight competitions held during the conference.

The Virginia Tech chapter placed first in the Student Design Competition with “Hokie Hooker,” their version of a cost-effective, reliable apparatus that would enable a quadriplegic to cast a fishing lure accurately, retrieve it, make additional casts, and reel in a weight simulating a fish on at least one cast.

For winning the design competition, the Virginia Tech chapter received \$200 and another \$1,000 in travel funds for the national ASME competition in Chicago in November.

Several individual Virginia Tech ME students also won awards during the District F Conference. Tiffany Murray, a senior from Norfolk, Va., won first place in the Technical Web Page Competition.

In a series of “Old Guard” competitions, which are sponsored by retired ASME members who continue

to support student activities, Ramtin Taheri, a senior from Virginia Beach, Va., placed first in the Technical Content Competition; Amanda Thomas, the chapter’s chair for the year and a senior from Vienna, Va., placed first in the Technical Poster Competition; and Taheri placed second and Greg Vonder Reith, a senior



The fishing pole from the ASME competition in action

from Fredericksburg, Va., placed fourth, in the Oral Presentation Competition.

The Virginia Tech chapter also placed first in the Ingersoll-Rand Contest, which recognizes the most active student chapter in the district for the academic year. “In the five years that this award has been presented, our chapter has finished first three times and second twice,” Reinholtz said. “This should again put us in good position to compete for the title of the most active student ASME section in the world.”

In addition, the Virginia Tech chapter won the Student Kilometer Award, for bringing the most participants the longest distance, and the Students in Attendance Award for having the largest number of students at the conference.

“I want to convey a special thanks to our chair, Amanda Thomas, for leading the student section to another banner year,” Reinholtz said.

ASME District F includes engineering schools from Alabama, Delaware, District of Columbia, Florida, Georgia, Maryland, Mississippi, North Carolina, South Carolina, Tennessee and Virginia.

“Human energy is the primary resource of the organization. Tapping into it, unleashing it, focusing it, perpetuating it - these form the cornerstone of the future.”

And Corning, committed to the future, and a recognized world leader in technology - provides a continuing opportunity for human energy to achieve its maximum potential - in an environment that nurtures talent, creativity and ambition.

Whether your interest is in science & technology, worldwide telecommunications and information display markets, technically advanced scientific and life science products, there is a life-time of opportunity for you at Corning.

If you're interested in making a long-term contribution - if you're interested in helping to define and shape the future - we invite you to join the Corning Team!



CORNING

www.corning.com

Corning is an Equal Opportunity Employer M/F/V/H
Corning Incorporated, Corning, New York 14831

Engineering Students Win Challenge X Competition with Ethanol-Powered SUV

By Liz Crumbley

With a Chevrolet Equinox SUV they re-engineered into an ethanol-powered hybrid, the Virginia Tech Hybrid Electric Vehicle Team (HEVT) took top honors during the second-year competition of Challenge X: Crossover to Sustainable Mobility, held at the General Motors (GM) Mesa Desert Proving Grounds in Arizona.

The HEVT is among 17 university teams selected by the U.S. Department of Energy (DOE) and GM to compete in the three-year Challenge X, a national competition that encourages engineering students to help develop advanced propulsion technology for the next generation of energy-efficient, low-emissions vehicles.

In addition to placing best overall, the Virginia Tech team won in three categories, reported mechanical engineering graduate student Steven Boyd, HEVT's leader. "We took first place in best written technical report, lowest emissions, and lowest petroleum consumption," Boyd said. "We achieved a 75 percent petroleum reduction from the standard Equinox consumption."

The HEVT engineering students, most of them undergraduates, modified the Equinox using a Saab 2-liter E85 engine that runs on 85 percent ethanol and 15 percent gasoline. The team integrated the Saab engine into the Equinox with a split parallel hybrid electric drive.

"With the E85 engine and two battery-powered electric motors, we can use either to turn the wheels — or we can use them together," said Doug Nelson, HEVT faculty adviser and professor of mechanical engineering at Virginia Tech. "The motors also can be used as a generator to absorb energy from the engine and recharge the batteries."

Ethanol is a renewable fuel typically distilled from corn. In addition to achieving the goal of reducing petroleum consumption, the E85 fuel mixture produces fewer overall greenhouse gas emissions.

"It helps to have the 15 percent gasoline in the fuel for cold starts," Nelson added. "From the beginning of the competition, our goal has been to reduce the petroleum



Centennial
contractors enterprises, inc.



We are a national commercial general contractor performing design build & construction services for government & institutional facilities across 17 states.

Requirements: Must be working towards B.S. Degree in Civil or Mechanical Eng., Construction Mgmt or CET. We offer excellent compensation and advancement potential. Please apply online at www.cce-inc.com/join.htm

We are offering entry level opportunities for:

Field Engineers & Summer Interns

Assisting project managers & superintendents in performing take-offs, scopes of work, scheduling, subcontractor management & safety program.

MicroAire®

Integrity in Product & Personnel for the Benefit of Patients



MicroAire Surgical Instruments is a leading manufacturer of powered surgical instruments and disposable surgical products. Located in Charlottesville, Virginia. MicroAire markets products globally for use in orthopedic, plastic, and oral-maxillofacial surgery.

MicroAire is currently seeking graduating, co-op and internship students to assist in the design, development, and manufacture of powered surgical instruments. While employed at MicroAire, you will gain valuable experience in the fast-paced field of medical devices. Interested **Mechanical, Electrical and Industrial Engineering** students are encouraged to contact:

Human Resources
MicroAire Surgical Instruments
1641 Edlich Drive, Charlottesville, VA 22911
(800) 538-5561 (Toll Free)
(434) 975- 4144 (Fax)

careers@microaire.com

To learn more about **MicroAire** and our line of products, visit our website at www.microaire.com.

consumption of the Equinox by as much as 80 percent.”

“Developing the advanced technologies that reduce U.S. dependence on imported oil is critical to the future prosperity of our country,” said Ed Wall, program manager for the FreedomCAR and Vehicle Technologies Office of DOE’s Office of Energy Efficiency and Renewable Energy.

To succeed in Challenge X, the Virginia Tech team had to produce a fuel-efficient, low-emissions Equinox that also retains all of its original performance and utility factors, such as fully operating air conditioning, cargo space and acceleration performance.

“Designs like our Equinox hybrid demonstrate that alternative fuels and advanced propulsion technolo-

gies can increase fuel economy and reduce emissions without sacrificing vehicle performance or utility,” Boyd said.

During this second year of the competition, the vehicles re-engineered by the HEVT and other teams were judged on design, fuel economy,



The HEVT Team in Mesa Arizona

The HEVT members are students from the departments of mechanical engineering, electrical and computer engineering, and computer science in the College of Engineering.

performance and a number of other factors. After this event, the teams will have another year to refine their entries for the final competition event and judging in June 2007.



Looking for a position where you can utilize your engineering skills and stay “Ahead of The Curve” in the engineering world? At The Engineering Groupe, Inc. we stay ahead of the curve by optimizing the use of our people, technology and expertise to consistently find the best, most cost-efficient ways to provide civil engineering services.

We’re currently looking for highly motivated, team-oriented candidates eager to work in a cutting edge environment that fosters growth and development. Our firm provides superior services for public and private clients in the areas of civil engineering, land development engineering, land planning, feasibility studies, surveying, GPS, highway design, water resources engineering, landscape architecture and construction administration.

We have offices throughout Northern Virginia including Woodbridge (Headquarters), Alexandria, Leesburg and Fredericksburg as well as an office in Charlottesville.

www.enggroupe.com

"These students are working on the same challenges that our GM engineers continually work on every day — high-efficiency, high performance vehicles that consume less fuel and produce fewer emissions from the well to the wheel," said Dan Hancock, vice president of GM Powertrain Engineering. "This hands-on learning is providing them the necessary skills to embark on a career in engineering with a competitive advantage."

DOE and GM gave each team chosen to participate in Challenge X an Equinox and \$10,000 seed money, as well as up to \$25,000 in automotive parts.

The other teams competing in Challenge X are from Michigan Technological University, Mississippi State University, Pennsylvania State University, Rose-Hulman Institute of Technology, San Diego State University, Texas Tech University, Ohio State University, University of Akron, University of California-Davis, University of Michigan, University of Tennessee, University of Texas at Austin, University of Tulsa, University of Waterloo, University of Wisconsin-Madison, and West Virginia University.



ADAPTIVE METHODS

ABOUT ADAPTIVE METHODS



Formed in 1973 as Applied Hydro-Acoustics Research, Inc., Adaptive Methods quickly became a partner with the U.S. Navy in developing modern, towed-array sonar systems for ocean surveillance and anti-submarine warfare applications. Our core products for the Navy have expanded from engineering services to include the development of modern software and integrated computing hardware solutions for surveillance and tactical sonar modernization programs.

We adopted our new corporate identity - Adaptive Methods - in August 2005 to better reflect the expanded scope of the Company's products and business values.

Adaptive Methods continues to successfully execute technology transition programs that serve the Navy's objective to transform undersea warfare capabilities. The Company's programs deliver increased product value through improved sensor performance, operability and user flexibility.

Our development and real-time systems implementation of adaptive signal and information processing algorithms provide the sonar operator with increased detection range and resolution to monitor the acoustic field. Data fusion and intelligent display technologies for complex multi-sensor systems provide the operator with comprehensive situational

awareness and powerful contact evaluation tools. Mission management and decision-aid products leverage our advanced modeling and simulation technology to ensure optimum employment of valuable sensor and processing resources.

Looking forward, Adaptive Methods will offer our talented workforce new opportunities to harness innovative technologies for tactical surveillance and security sensor systems. In all endeavors, we will maintain focus on our foremost goals of product values and customer satisfaction.

We are an equal opportunity employer actively supporting workforce diversity and proud to be an affirmative action employer. Women and minorities are encouraged to apply.



Adaptive Methods is a developer of advanced sensor processing and computing architecture products for surveillance, security and military combat systems.

Visit our Careers section for a listing of all current open positions; then, send your resume to careers@adaptivemethods.com

www.adaptivemethods.com



YOUNGBLOOD TYLER & ASSOCIATES, P.C.

"ENGINEERING EXCELLENCE SINCE 1971"

7309 HANOVER GREEN DRIVE
MECHANICSVILLE, VA. 23111
(804) 746-5285

Youngblood, Tyler & Associates, P.C. is a consulting engineering firm which provides land Planning, civil engineering and land surveying services in the land development field, from conception to completion, for residential, office, industrial, and commercial projects.

A Brief Look into Mobile Phone Technology

By Kari Adkins

Have you ever wondered how that little cellular phone in your pocket or purse actually works? How does that phone place a call without any wiring to someone across the country or on the other side of the world without a moment's hesitation? Most of us take our cell phones for granted, never questioning how the device works or the years of research and development that went into one of the fastest growing technologies in the world.

A cellular phone by definition is "a mobile radiotelephone...that uses a network of short-range transmitters located in overlapping cells throughout a region, with a central station making connections to regu-

lar telephone lines." What makes a cell phone work is its ability to use radio frequencies to transmit sound across great distances to cellular base stations and then on to the receiving end of the call.

The technology that is used in the modern cell phone can be traced back to the 1950s with the development of two way radios for emergency services. A two way radio essentially works like this: one person pushes the transmit button on his or her device and talks to the person on the other end, ending his statement with the phrase "over" to signify that he is done speaking. Then the person on the other end of the two way radio can talk back to the other person.

Essentially a two way radio allows for one person to transmit sound data while the other person waits for the channel to open up once the first person finishes speaking. This is called a half-duplex radio.

In contrast, a cell phone is a full-duplex device, meaning that both parties on the call can speak at the same time. This is due to the fact that the two phones are operating on different channels instead of the same channel as seen in two way radios that have been used for over forty years in the United States.

What we today would call a modern cell phone was first developed for commercial use in the 1980s. Across Europe and the United States in this time period many dif-

it's a control thing.



careers.lutron.com

Important Dates @ VT:

- **Sept. 19** - Engineering Expo (10a-4p)
Commonwealth Ballroom
- **Sept. 20** - Engineering Expo (9a-2p)
Commonwealth Ballroom
- **Oct. 1** - Full-Time Resume Drop Deadline
Submit resume through eRecruiting
- **Feb. 13** - CONNECTION Co-Op Fair (10a-4p)
Squires Student Center

Lutron is seeking both Full-Time and Co-Op/Intern students studying:
EE, CmpE, ME, CS, Physics, Math

ferent cell phone technologies were developed to meet the ever-growing desire of the public to have mobile phones. In Europe the Global System for Mobile Communications (GSM) network was developed by the European Union to be a unified system enabling users to go from country to country without having to purchase another mobile phone while in that country.

This is made possible through a series of towers that all operate on the same band of frequencies, thus eliminating one of the common problems that would be faced if each country developed a different network. Today there are four different bands that cell phones operate on: in Europe the phones either operate on the 900 or 1800 band; in the United States, Canada, and South America the phones operate on either the 850 or 1900 band. Many of today's phones are quad-band phones, making them able to connect to calls all over the world, whether their phone was purchased in the United States or Europe.

Another attribute of the GSM network that makes cell phones what we know them to be today is the Subscriber Identity Module (SIM) card. A SIM card stores information about the user of a cell phone and their personal data such as phone numbers and the country of origin for the phone. The development of these two technologies paved the way for a common cell phone system across Europe.

In the United States we also use the GSM network. There is also another network that is used as well: the Code Division Multiple Access (CDMA) network. CDMA is a network that has been developed primarily in the United States. The only downside to this network is that the phones do not utilize SIM cards, as mentioned above. This complicates the process of purchasing a new phone or visiting a foreign country and having to buy a new phone while visiting that country because the country uses a different band as compared to the United States.

The devices that make it possible

Now that the method of transmission has been established, one can look at the evolution of the cell phone into the modern small phones that we are all familiar with today.

Build something that means something.

While your fellow graduates are busy making coffee and emptying wastebaskets, you can be doing **something much more rewarding: starting your career with a company that wants you on the job, learning, growing and becoming a valuable, contributing member of a team. That company wants you now.**

We have a diverse, challenging career opportunity that is not readily found in today's construction market waiting for you. Contact Bob George at 610-222-3144 to take advantage of the AI / VT connection today!



American Infrastructure™

PENNSYLVANIA • DELAWARE • MARYLAND • VIRGINIA

careers@airecruiting.com

www.americaninfrastructure.com

Southland Industries is a mechanical design-build contractor specializing in **HVAC and Plumbing** services. Each year **we recruit** from major universities and regional colleges in an effort to attract the **best and brightest** mechanical and construction engineers.

Please visit us on the web at www.southlandind.com to learn more about **who** we are, **what** we do, and how we are the **right company** for you.



Southland Industries
Design • Build • Maintain

Offices are located nationally, in the Mid Atlantic we are located at:
22960 Shaw Road, Suite 800 Sterling, VA 20166 703.834.5570

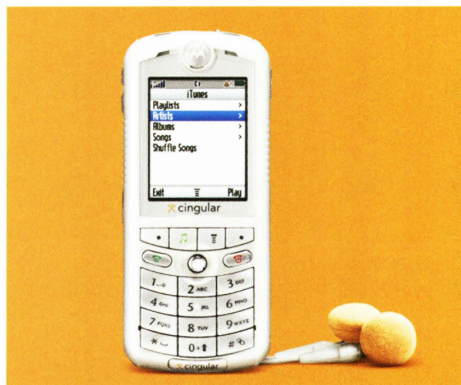
www.southlandind.com

The first mobile handheld phone was the Motorola DynaTAC 8000X, which was rather large and cumbersome, but truly revolutionary for the time. At this time all phones were installed in cars and ran on an analog signal.

As car phones became more popular developers were trying to figure out ways to "cut the cord" and make the phone truly wireless and capable of being carried anywhere with relative ease. Cell phones began to diminish in size with the development of power amplifiers and transceivers that could provide the amount of power needed to make a cell phone function in an even smaller package. Without these power amplifiers a cell phone like we use today would not work because the small battery would not provide enough power. The development of these chips paved the way for the cell phone as

we know it today.

The size of the cell phone decreased exponentially after the development and marketing of power amplifiers to industry leaders, including



The Motorola ROKR™

Nokia and Motorola, today's number one and two, respectively, in the cell phone industry. Phones today are lightweight and hold a decent charge. Most phones provide hours of talk time and can last for a few

days on standby, before needing a re-charge. These phones have color screens, cameras, GPS tracking systems, internet and instant messaging access, and even the ability to download songs and data without being connected to a computer or on a wireless LAN.

The newest phones can also play MP3's and industry leaders are working on combining devices such as the popular Apple iPod with a phone, as seen with the Motorola Rokr phone which was released this year. Many phones are Bluetooth technology ready, enabling consumers to connect their phones with their computers and synchronize their calendars and pictures with their phones with a simple click of a button.

The future will only tell what new technologies will be incorporated

The road to success is often paved by Titan America.

Send your resume to:



**University Recruiting
Titan America
6071 Catawba Rd.
Troutville, VA 24175**

Email: hrad@titanamerica.com

EOE/AA/M/F/H/V



**TITAN
AMERICA**

Opportunities for: Chemical, Electrical, Mechanical, Mining and Civil Engineers

Titan America is one of the premier cement and building materials producers in the Eastern United States. We are best known by our brand and business names: Essex Cement, Roanoke Cement, Separation Technologies and Tarmac.

Titan America's operations include cement plants, ready-mix concrete plants, concrete block plants, quarries, import and rail terminals, as well as fly ash production facilities. We provide outstanding opportunities for engineering graduates to work in a challenging environment where your voice is heard, your contributions matter, and your career really rocks.

into cell phones as consumers desire phones to be combinations of many different devices. How cool would it be able to have everything in one device: a PDA, iPod, cell phone, and internet access in one device? It is a little over the top admittedly but it is a dream that is becoming a reality with every passing day.

Cell phone technology changes on a daily basis, caused by the influx of so many different designs of phones by the many different manufacturers in the industry. Who knows what the future will bring as it relates to cell phones and our interactions with these devices. One thing is certain: as long as there is a market, the phones will get smaller and combine multiple technologies so that consumers can "get the most bang for their buck" with their new piece of technology.

So, the next time that you pull out your cell phone to make a call, just remember that the call you are making is the result of many years of research and development around the world that has changed the way the world and its citizens interact with a simple click of the talk button.



Make It Happen Here

Engineers are idea people who help grow our business.

You have your Engineering degree, which means you are in hot demand. There are numerous career options out there. But think about it. How many would allow you to chart the future course for a Fortune 500 company and to achieve the kind of visibility that implies?

You will use your talent for examining trends, analyzing complex issues and developing new products to drive business strategy for a financial services leader.

Learn more, do more, achieve more – and always be rewarded for it! Are you a student pursuing a quantitative or technical engineering degree? Then discover the following full-time opportunities at Capital One.

- Operations Analysts
- Financial Analysts
- Data Analysts

capitalone.com/careers

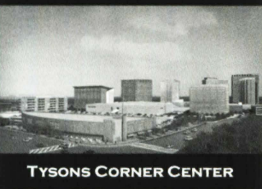
We are an equal opportunity employer committed to diversity in the workplace.
We promote a drug-free work environment.

Capital One®

Auto Loans | Banking | Credit Cards | Healthcare Finance | Home Loans | Personal Loans | Savings | Small Business



NATIONAL AIR & SPACE MUSEUM



TYSONS CORNER CENTER



PATENT & TRADEMARK OFFICE

we offer careers in:

- engineering
- land planning
- landscape architecture
- transportation
- gis/mapping
- telecommunications
- environmental sciences
- surveying

**EXCITING PROJECTS!
18 GREAT LOCATIONS!
ESTABLISHED FIRM!**

Why Work For PHR+A ?

- Reputable Firm and Growing Since 1952
- 18 Convenient Offices In VA, MD, WV And PA
- Competitive Pay And Benefits Package
- 401k With Company Matching
- Tuition Reimbursement
- Exciting And Challenging Projects
- Opportunity For Growth And Development
- Employee Recognition Programs
- State-of-the-art Technology
- Great Place To Build Your Career!

If you are interested in becoming a part of the PHR+A team either as an intern or full-time employee, please email your resume to human.resources@phra.com or you can mail a copy of your resume to:

Patton Harris Rust & Associates
Attn: Human Resources
14532 Lee Road
Chantilly, Virginia 20151

Patton Harris Rust & Associates
Engineers, Surveyors, Planners, Landscape Architects.

HDR ONE COMPANY | Many Solutions™

If you're looking for an engineering, architecture, planning, design, environmental, consulting or design-build job opportunity and the chance to shape your own future, we want you at HDR. People are HDR's most valuable asset. HDR is known industry wide for its broad based employee ownership, knowledgeable and experienced professionals, and the creative solutions they have for our projects. Our clients choose HDR because of our staff, their expertise and dedication. Client service sets us apart from the competition.

We offer employee-ownership, outstanding training, professional development and career opportunities in offices across the US in a variety of disciplines. We're continuing to grow and are looking for staff with technical and leadership skills that can help lead us into the future.

HDR
8404 Indian Hills Drive
Omaha, Nebraska 68114-4049

**Ph: (402) 399-1000
Ph: (800) 366-2701
www.hdrinc.com**

Chris Kraft to Present Moon Rock to Virginia Tech's Engineering College

Staff Writer

The man who led the U.S. mission to the Moon in the 1960s will be honored at Virginia Tech Sept. 30 by the National Aeronautics and Space Administration (NASA) for his direction of America's space program. Dr. Christopher C. Kraft, Jr., a 1944 aerospace engineering graduate of Virginia Tech, will receive NASA's Ambassador of Exploration Award.

Michael L. Coats, director of NASA's Johnson Space Center, will present the award to Kraft in front of more than 100 of his prominent fellow alumni of Virginia Tech's College of Engineering. In turn, Kraft will present the award — a small sample of lunar material encased in Lucite and mounted for public display

— to Richard Benson, dean of engineering, for permanent display in the college.

The moon rock to be awarded to Kraft is part of the 842 pounds of samples brought back to Earth during the six Apollo lunar expeditions from 1969 to 1972.

The ceremony will begin at 10:30 a.m. at The Inn at Virginia Tech. Because of limited seating, admission will be by invitation only.

"We are deeply honored by Dr. Kraft's decision to present his award to Virginia Tech's College of Engineering for permanent display," said Benson. "There is a generation of engineers, of which I am a part, which came of age during the

Mercury, Gemini and Apollo space missions. Dr. Kraft was the face of those missions — engineering at its daring best. Dr. Kraft's extraordinary contributions to NASA are just the measurable part of his legacy. How many of those inspired teenagers in the 1960's went on to successful careers in aeronautics, microelectronics, medical devices, computer science, engineering education, and more? We'll never know the whole of his legacy, but we can safely say that few Americans have ever done so much to advance the engineering and scientific prowess of this great nation."

NASA also is presenting the Ambassador of Exploration Award, in ceremonies elsewhere, to the 38 astronauts and other key individuals who

WELLCO ENTERPRISES, INC

wellco

**ALWAYS
A STEP
AHEAD**



TUFFKUSHION®

**COMBAT BOOTS THAT
"MAKE THE DIFFERENCE"
FACTORY DIRECT PRICING**

FRED WEBB, JR. VP CLASS OF '82

WWW.WELLCO.COM 800-840-3155



L.F. Jennings, Inc.

The Mid-Atlantic area's premier General Contractor

You are tomorrow's builders.

GO HOKIES!

407 North Washington Street • Fall Church, VA 22046 • (703) 241-1200

McDONOUGH BOLYARD PECK
CONSTRUCTION ENGINEERING

ACHIEVING QUALITY THROUGH TEAMWORK



800-898-9088

mbpce.com

Excellent Professional Opportunities for Inspectors, Civil Engineers, Mechanical Engineers, Electrical Engineers, & Architects interested in Construction Management.

SERVICES

- Construction Management
- Construction Claims Analysis
- Resident Engineering
- Program Management

Send Resume to:
Attn: Human Resources
8315 Lee Highway, #400
Fairfax, VA 22031
Fax - (703) 245-5993
recruiting@mbpce.com
EEO/AAE

Branch Locations
Fairfax, VA
Williamsburg, VA
Raleigh, NC
Roanoke, VA
Columbia, MD
Atlanta, GA

participated in the Mercury, Gemini and Apollo space programs, for realizing America's vision of space exploration from 1961 to 1972.

Kraft's career is indeed phenomenal. As NASA's director of flight operations in the 1960s, he was instrumental in the decision to land an astronaut on the moon. It was 1961 and the Russians had just sent Yuri Gagarin into space. Several weeks later U.S. astronaut Alan Shepard completed a successful mission, spending 15 minutes in a suborbital flight directed by Kraft. Following that flight, President Kennedy challenged the country to land a man on the moon within the decade and return him safely to earth.

Kraft recalled this challenge, saying "With all due respect to the memory of John F. Kennedy, I must tell you that I thought the man had taken leave of his senses. We had never even placed a man in orbit. And yet, here in front of television cameras beaming his message all over the world was the President of the United States committing us to a lunar landing."

Despite his reservations at the time, Kraft says NASA succeeded with the moon landing because of the "national commitment to the cause. We had financial problems. We had people problems, and we had horrible experiences to deal with...But the great majority of the public, the Congress, and the presidential administration we had during that time period were very supportive of the goals we had set."

After Neil Armstrong set foot on the moon, Kraft went on to lead the planning and operational control of the two sub-orbital Mercury

missions through Gemini, Apollo, Skylab, and the Apollo Soyuz/test project.

He was deeply involved in the development of the Space Shuttle. During its definition and design studies, he played a vital role in the decision-making process that created the Space Shuttle program, and he determined the initial configura-



Dr. Christopher C. Kraft

tion of the Space Shuttle system, a new concept in space transportation. Kraft was the director of NASA's Lyndon B. Johnson Space Center in Houston, Texas from January 1972 to August 1982.

A native Virginian, he was born in Phoebus in 1924, two years prior to the launching of the first liquid-fueled rocket by the American physicist Robert Goddard. The influence of high school teachers led him to his choice of engineering as a profession, and he selected Virginia Tech. Graduating in 1944 with a

bachelor's degree in aeronautical engineering, he immediately joined the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics (NACA), the precursor of NASA.

In October 1958, Dr. Kraft was selected as one of the original members of the Space Task Group, the organization established to manage the Project Mercury. The group developed the basic concepts of the Mercury Project that launched the human space flight program for the United States. He personally served as the flight director for all of the Mercury missions and many of the Gemini missions.

Dr. Kraft retired from NASA in 1982. In a tribute to his career at the time, the Roanoke Times editorialized that Dr. Kraft "... probably instilled more confidence in our space program than any slick campaign could have done, because of his knowledge and ability to impart it. He knew more about all of the systems aboard our spacecraft than anyone else, and was in the unenviable position of making quick, life and death decision about the flights. He was the ultimate technical generalist. Even his name seemed perfect for the job."

For all your business needs call
CS Business Systems, Inc.



1236 Main Street
Buffalo, New York 14209
(800) 886-6521

www.csbusiness.com

Would you hate your alarm clock less if you had a job you loved more?

We are currently hiring in the following departments:

Software Engineers (*Embedded*)
Software Application Developers
Design Engineers (*Digital/Analog/RF*)
Design Certification Engineers
Aviation Software & System Engineers
Aircraft Systems Designer - Mechanical
Mechanical Engineers
Engineering Technicians
Software Test Technicians



Send resume and salary requirements to:

Garmin International, Human Resources, 1200 East 151st St., Olathe, KS 66062

fax: 913-397-0835 • e-mail: engineeringjobs@garmin.com

For more information on open positions,
see the job opportunities section at www.garmin.com



For nearly half a century, the **Institute for Defense Analyses** has been successfully pursuing its mission to bring analytic objectivity and understanding to complex issues of national security. As a not-for-profit corporation operating three federally funded research and development centers that serve the Office of the Secretary of Defense, the Joint Chiefs of Staff, Unified Commands and Defense Agencies, we provide a solid and exciting foundation for career growth and longevity. And, through specialized analytic, technical and scientific talent, we are moving steadily forward, confidently increasing our capabilities to face the country's important security issues.

How will you **put your** **expertise to work every day?**

IDA is seeking highly qualified individuals with degrees at the doctoral or master's level in the following:

- Biochemistry
- Biomedical Engineering
- Chemistry
- Chemical Engineering
- Economics
- Electrical Engineering
- Genetics, Bioinformatics & Computational Biology
- Materials Science & Engineering
- Mathematics
- Mechanical Engineering
- Operations Research
- Physics & Astronomy
- Statistics
- Systems & Computer Science

Along with competitive salaries, IDA provides excellent benefits including comprehensive health insurance, paid holidays, 3 weeks' vacation and more — all in a professional development environment that encourages individual thinking and produces concrete results. Applicants selected will be subject to a security investigation and must meet eligibility requirements for access to classified information. US citizenship is required.



INSTITUTE FOR
DEFENSE ANALYSES
www.ida.org

Please email your resume to: resumes@ida.org, or mail to:
Institute for Defense Analyses, ATTN: Employment,
4850 Mark Center Drive, Alexandria, VA 22311;
FAX: (240) 282-8314.

Visit our website for more information on our specialized opportunities. EOE.



NRL • Naval Research Laboratory

ACCEPT THE CHALLENGE

Are you a seasoned professional or a recent college graduate seeking challenging and rewarding employment? Would you like to become a member of an elite research and development community involved in basic and applied scientific research and advanced technological development for tomorrow's Navy?

The Navy's corporate experimental laboratory, Naval Research Laboratory (NRL), offers a wide variety of challenging research positions. The main office of NRL is located in Washington DC with remote sites located at Bay St. Louis, MS and Monterey, CA. NRL is always looking for new achievers with backgrounds and/or graduate-level education in Aerospace, Ceramics, Computers, Electronics, Material and Mechanical Engineering, Computer Science, Chemistry, Materials Science, Metallurgy, Physics, Geology, Geophysics, Meteorology, and Oceanography. Technical excellence and achievement through exchange of new ideas, opportunities for continuing education, and publication of research results is strongly encouraged.

APPLY TODAY

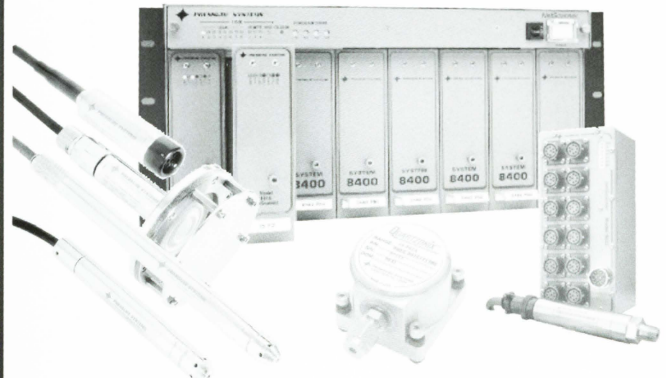
Applications accepted for specific vacancies only. Employment opportunity information for all NRL sites is available on our Human Resources website at <http://hroffice.nrl.navy.mil/>. If you do not have access to the internet or require more information, please call our Human Resources Job Information Center on (202) 767-3030.



NRL is an Equal Opportunity Employer

NRL • 4555 Overlook Ave SW, Washington DC 20375

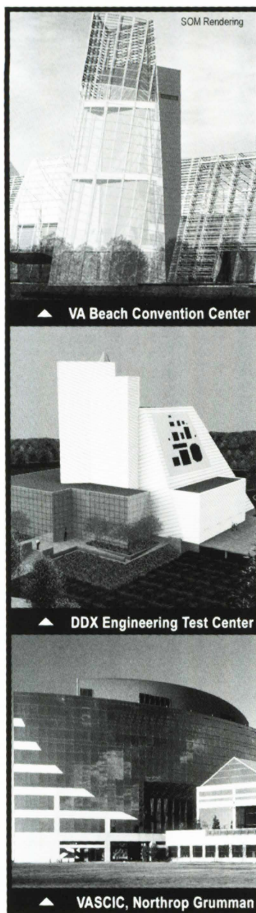
Esterline Pressure Systems



**Precision Level and Pressure Instrumentation
from Transducers to Systems for
Environmental, Industrial and Aerospace**

Visit us on the web:
www.PressureSystems.com

On-line Transducer Store:
www.LEVELandPRESSURE.com



Where SUCCESS is THE CORPORATE CULTURE

Since 1920, Clark Nexsen has been a firm that prides itself in our commitment to our employees and exceptional client service.

We offer you an opportunity to work with one of ENR's Top 500 design firms* on some of the highest profile projects in the Hampton Roads area.

COME AND MAKE YOUR MARK...

CLARK • NEXSEN

Architecture & Engineering

WWW.CLARKNEXSEN.COM

Norfolk Charlotte
Alexandria Raleigh Roanoke

*Engineering News-Record April 19, 2004

MOTHER, AEROBICS INSTRUCTOR, COMPUTER ENGINEER, FBI SPECIAL AGENT.



Special Agents

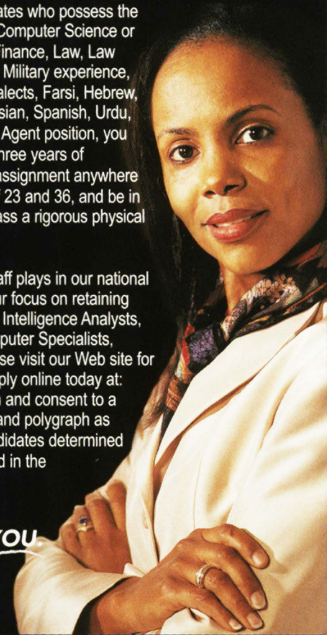
We are currently seeking Special Agent candidates who possess the following critical skills: Intelligence experience, Computer Science or IT, Engineering, Physical Science, Accounting/Finance, Law, Law Enforcement, or other Investigative experience, Military experience, and Foreign Language (Arabic, Chinese - all dialects, Farsi, Hebrew, Hindi, Japanese, Korean, Pashtu, Punjabi, Russian, Spanish, Urdu, and Vietnamese). To qualify for the FBI Special Agent position, you must possess a four-year college degree plus three years of professional work experience, be available for assignment anywhere in the FBI's jurisdiction, be between the ages of 23 and 36, and be in excellent physical condition with the ability to pass a rigorous physical fitness test.

Professional Support

The important role our Professional Support staff plays in our national security is unquestionable. We're increasing our focus on retaining quality candidates for critical openings such as Intelligence Analysts, Language Specialists, Financial Analysts, Computer Specialists, Investigative Specialists, and many more. Please visit our Web site for complete details. Positions are added daily. Apply online today at: www.fbijobs.com - You must be a U.S. citizen and consent to a complete background investigation, drug test, and polygraph as a prerequisite for employment. Only those candidates determined to be best qualified will be contacted to proceed in the selection process.

Today's FBI. It's for YOU.
Visit FBIjobs.com

The FBI is an equal opportunity employer.



Drawing A Line On Quality. Since 1947.

Interesting Challenging Rewarding

HSMM provides a challenging and stimulating environment for our personnel without losing sight of our corporate principles. We offer excellent opportunities for career growth and development in a respectful, professional work environment.

We serve clients at all levels of government and throughout the private sector. Our team of over 600 professionals develop creative, yet practical, designs and engineering solutions for clients worldwide.

Professional and technical employment opportunities available in various disciplines and locations. Submit your resume today! www.hsmm.com

EOE/AA

HSMM

ARCHITECTS ENGINEERS PLANNERS

ENGINEER

WE'RE NOT LIKE EVERY OTHER HIGH TECH COMPANY. WE'RE HIRING.

No one told you the hardest part of being an engineer would be finding your first job. Of course, it's still possible to get the high tech work you want by joining the U.S. Air Force. You can leverage your degree immediately and get hands-on experience with some of the most sophisticated technology on earth. To find out how to get your career off the ground, call 1-800-423-USAF or visit our Web site at airforce.com.



U.S. AIR FORCE
CROSS INTO THE BLUE

NATIONAL SECURITY AGENCY

NSA

Where Intelligence Goes to Work

Join our workforce and get a cool career, great benefits, and a secure future.

Visit our Web site to:

- > Learn how you can apply your technical knowledge
- > Find Computer Science/Engineering jobs available
- > Apply online

NSA: Securing Tomorrow Today



www.NSA.gov/Careers

LIFE AT NSA:

"Apply skills in new ways relevant to critical problems."

Visit www.NSA.gov/Careers to learn more.



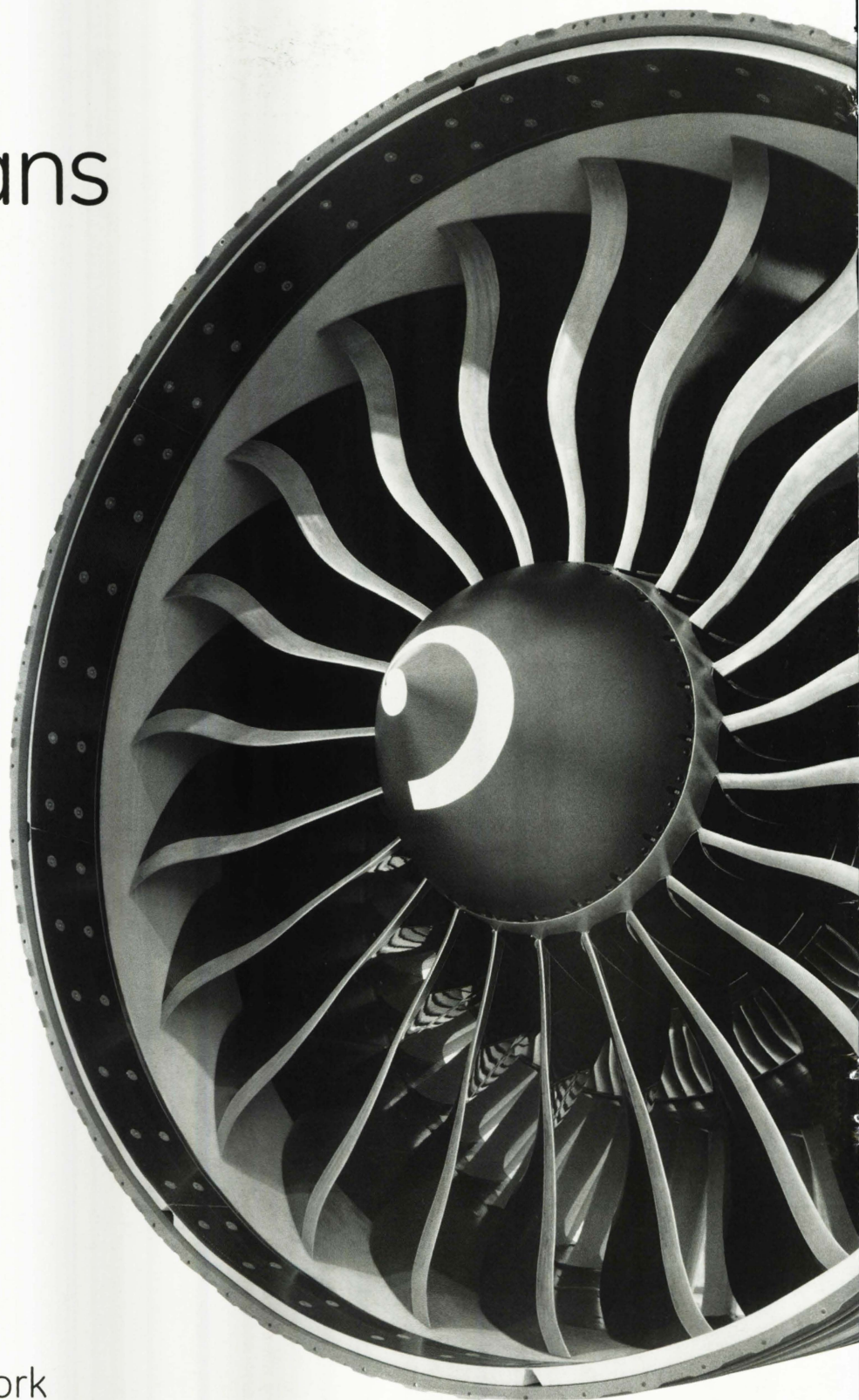
U.S. citizenship is required. NSA is an equal opportunity employer. All applicants for employment are considered without regard to race, color, religion, sex, national origin, age, marital status, disability, sexual orientation, or status as a parent.

GE
Aviation

We're big fans of aviation.

The world's most powerful turbofan engine, the GE90-115B, is backed by some of the boldest technical innovations in aviation history. In fact, the pursuit of innovation drives everything we do.

We're also big fans of engineering students from Virginia Tech, whose technical contributions can help us shape the future of aviation.



imagination at work