The Cougar Engineer



Gracious Graduate UH Degree Helped Alumnus Succeed in Career



PC Pioneer Alumnus Helped to Change the Way the World Computes



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From the Dean

Greetings Cougar Nation!

As always, it's a great time to be a Cougar engineer. The University of Houston is on the move and people are taking notice. UH is attracting more world-class researchers. academic leaders and scholars to Houston, research funding is on the rise and enrollment is up-all necessary measures to become a nationally competitive research institution. Alumni participation and giving is another measure for top tier status and you are doing an exceptional job helping us reach this goal!



Over this past year, we've had the opportunity to meet many Cougar engineers at college-related events. We've learned about your professional achievements and personal endeavors, a few of which have been featured in *The Cougar* Engineer. Not only are the departments holding more events for alumni, but the Engineering Alumni Association also has many reunions and upcoming events planned, including an EWeek reception in February and the Cullen College of Engineering Alumni Awards Gala in June. The college is also hosting its annual golf tournament in April and the ASME Crawfish Boil is in May. These are just a few opportunities available to you to come out and network with fellow Cougar engineers. I hope to see many of you there!

In this issue of The Cougar Engineer, we feature several alumni who are working on projects and technologies that are absolutely phenomenal. These alumni are trailblazers whose ideas have had tremendous impact on technology development, engineering design and business practice. We are proud of these accomplishments and the overall success of our UH engineering alumni.

Go Coogs!

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Out of the Ordinary



Alumnus Moonlights as Stand-up Comedian

I t's the way of the comic: bring your home life to the stage.

That's exactly how **Saidas "Sai" Ranade** (1982, MSChE, 1985 PhD ChE) does it. Throughout his life, he has accrued more than enough material—drawing from experiences being reared in India, acclimating to a new American culture, the challenges of earning a doctoral degree in engineering and dot-com layoffs.

His take on these experiences tenders chuckles from audiences in comedy clubs everywhere from Massachusetts and Illinois to Texas and California.

"Comedy is about making light of life," Ranade explains. "Chemical engineering gives me unique experiences that a lot of other people haven't had. My style is driven by ironies, the twists and turns in my own life."

He sees his time on stage as a great release, and audiences seem to like him.

So much so that in 2000 he won the comedy category of the Internet televised show the "Next Big Star," hosted by the late Ed McMahon. Not to mention his bits have regular spots on comedy channels on Sirius Satellite Radio among the likes of clips from Bob Hope, Kevin James, George Carlin, Bill Cosby, Ellen DeGeneres and Buddy Hackett. He has also twice been a finalist in Houston's Funniest Person Competition.

To learn more, visit www.egr.uh.edu/ cougarengineer.

—Erin D. McKenzie



Happenings

Alumnus Part of Shuttle Discovery Crew



ASA Astronaut John "Danny" Olivas

Mark Your Calendar

National Engineers Week Feb. 14–20

Engineering Alumni Association EWeek Reception

Come celebrate how engineers make a world of difference. Feb. 16

Institute of Electrical and Electronics Engineers (IEEE) Chili Cookoff

Test your best chili recipe and support the UH IEEE student chapter. March 11

UH Engineering Golf Tournament Come tee off in support of student scholarships. April 5

Cullen College of Engineering **Alumni Awards Gala**

Join the college and the Engineering Alumni Association in honoring engineering alumni, faculty and friends. Four Seasons Hotel, June 4

For additional information, visit www.egr.uh.edu.

Magazine Features Electrical Graduate

Carl Garcia (2005 MEE) was featured in the spring 2009 edition of *Minority* Engineer magazine, a publication first printed in 1979 that reaches minority engineers nationwide. Garcia, a project manager at RRI Energy (formerly Reliant Energy) in Houston, was among three people highlighted in an article sharing the success stories of minority electrical engineers.

Governor Appoints Alumnus to Coordinating Board

Durga D. Agrawal (1969 MSIE, 1974 PhD IE) was among three people appointed by Gov. Rick Perry to the Texas Higher Education Coordinating Board. The president and CEO of Houston-based Piping Technology and Products Inc., Agrawal will be tasked with setting policies and coordinating efforts to improve Texas higher education while he holds his seat. His term will expire Aug. 31, 2015.

Alumna Pens Book

Xiuli Wang (2000 PhD ChE) has co-authored the book Advanced Natural Gas Engineering with Michael J. Economides, an adjunct professor in the college's department of chemical and biomolecular engineering. Published

> in September, the book addresses the "unique issues and many challenges in the entire food chain of natural gas engineering related to upstream, midstream and downstream," according to its publisher, Gulf Publishing Company.

Award Recognizes Alumnus' **Groundbreaking Work**

The World Health Organization estimates that naturally occurring arsenic in groundwater accounts for the poisoning of more than 100 million people worldwide.

For inventing the first sustainable solution to the problem—a reusable polymer-based



hoto by John Kish IV

material capable of removing the poison from municipal water supplies and private wells—Arup K. SenGupta (1982 MSEnvE, 1984 PhD EnvE) has been chosen to receive a 2009 Astellas USA Foundation Award. Administered by the American Chemical Society, the award is given to individuals who have made significant scientific contributions that improve public health through their work in the chemical and related sciences. SenGupta is a professor of civil, environmental and chemical engineering at Lehigh University in Bethlehem, Pa.

To read more, visit www.egr.uh.edu/cougarengineer.



Mary Saulog Gamboa (2003 BSEE) proved herself as the most knowledgeable Cougar engineer in our *iSpy: Campus* Infrastructure Challenge printed in our summer 2009. Gamboa, who resides in Alief, correctly answered 20 out of our 23 teasers—earning her a brand new iPod Touch provided courtesy of the University of Houston Engineering Alumni Association.

On her stop in to pick up her prize, Gamboa admitted her path to the top was a dedicated one. She teamed with her sister, Trishia Saulog, who is currently attending UH's Conrad N. Hilton College of Hotel and Restaurant Management, and together, walked the campus and e-mailed other alumni that attended the Cullen College with Gamboa. Her sister, Gamboa boasted, even persuaded two of her professors to put up some of the more difficult pictures during lectures in the hopes someone in class may have the answer.

Much like the challenge hinted, the campus is changing as administrators devote themselves to building programs and adding infrastructure necessary to grow a better, top tier university. This is something Gamboa found out first hand while working to complete the challenge with her sister.

"Four of the things were not even there when I graduated," said Gamboa. "The campus has changed a lot in six years. I am glad my sister was there to give me an orientation."

View the answers online at www.egr.uh.edu/ cougarengineer.

Get Connected Through Social Networks

Check out Cullen College of Engineering's social networking pages. Enjoy live news feeds, see photos from alumni events, participate in discussions and reconnect with former professors and other fellow Cougar engineers on Facebook, LinkedIn and Twitter. To sign up, visit www.egr.uh.edu/cougarengineer.

Linked in. facebook



The Cougar Engi

Photo by Thomas She

Send Your Ideas

We are always looking for stories on alumni who are doing great things. If you know someone with a unique hobby, success story or anything else compelling, we would love to hear from you! Send suggestions to cougarengineer@egr.uh.edu or call us at 713-743-4220.

BREAKTHROUGH DEAS

Over the last century, we have witnessed technologies so incredible it's hard to believe we ever lived without them. The light bulb, the telephone, the Internet—all were life-changing inventions thought up by brilliant minds.

Our own University of Houston Cullen College of Engineering Cougars are among them, responsible for discovering everything from how to network ATM's and arm gas pumps with a credit card swipe option to the creation of software programs offering hospital staff better access to patient records.

Many more are using their education to create innovative devices. From futuristic contraptions many thought could only be dreamt up by Hollywood for the big screen to the gadgets that make living just plain easier for the rest of us, Cougar engineers are working to give rise to the next amazing thing.



Outside his office on the campus of Texas A&M University in College Station, few are aware of the schedule **William Schneider** (1968 MSME) keeps.

Ruled by far more than the semester's engineering lectures, Schneider has been rubbing elbows with billionaire and owner of Bigelow Aerospace, Robert Bigelow. For some six years, the two have worked out of Bigelow's North Las Vegas compound to establish the next big commercial space venture.

Serving as their blueprint—the cancelled TransHab inflatable spacecraft Schneider designed while he was a senior engineer at NASA's Johnson Space Center. Bigelow bought the rights to the craft in 2002 and, with Schneider's help, developed and subsequently launched into orbit two inflatable space habitats-Genesis I and Genesis II. Propelled into orbit on Dnepr rockets out of Russia July 12, 2006 and June 28, 2007, both are holding up well circling Earth just above the International Space Station. Created to be a third of the size of the real thing, the inflatable habitats are testing and validating technologies necessary to successfully carry out plans for a larger, crewed commercial orbital space complex.

"When I got the call shortly after my retirement from NASA that the project was canceled, I thought I'd never see this thing get made," the Louisiana native shared as he sipped coffee in an office where patent plaques and awards compete for wall space with some of the first



University of Houston Cullen College of Engineering

photographs of his inflatable creation. "Now, seeing this becoming reality, it is quite gratifying."

Aside from a few minor changes, the Genesis inflatables—measuring roughly 15 feet in length and 8 feet in diameter—are not too far off from what Schneider created for NASA in the late 1990s for use as a module on the space station.

Both are extremely lightweight due to a strategic layering of Kevlar, the material used in bulletproof vests; 3M Nextel, a lightweight ceramic cloth; and open cell foam that is all reinforced by Kevlar straps. This outer layering protects three inner bladders, made of thin plastic material that holds in the module's air.

Prior to launch, this outside shell collapses down, much like an umbrella, onto a hard structural core made from lightweight aluminum similar to those used for the skin on the fuselage

Breakthrough Ideas

FEATUR

and wings of many modern aircrafts. Right now, it is equipped with several test instruments including one that continually monitors radiation levels and internal pressure to be sure the inflatable craft is safe for humans to board.

"The Kevlar straps on the outside of the bladders are the things that take the pressure load," Schneider explains, noting the layers outside the straps—composed of Nextel and foam layers—are placed in a specific order to break up particles of space debris and micrometeorites that can pack seven times more power than a bullet. It's the same problem he was called in to perfect on the space shuttle during more than three-decades with the government run space agency. So far, his choice of materials has proven their durability. Not only can the inflatable space habitat handle air pressure four times greater than what's on Earth and close to three times more than NASA's space shuttle, it has withstood marble sized aluminum balls being shot against it at speeds of close to 16,000 mph.

Even through the rough vibrations of launch, it's held up flawlessly.

"The whole secret is to take it and have it collapsed and strapped onto the center structural core and attach it to the rocket," he said. "Once it has gone through all the vibrations, and is in Earth orbit, then we cut it loose and inflate it. The way it is constructed, it has three redundant bladders, much like a football, on the inside that help inflate it and now there it is, ready to go."

Bigelow Aerospace plans to employ this same technology with its next, much larger craft—Sundancer. It will be the first of the expandable habitats equipped with a life support system that will make it capable of being crewed by humans. A reality as soon as 2011, it will make way for more like it, that the company hopes to attach together using a magnetic docking system Schneider designed.

The connected modules are expected to have several different uses, including everything from space tourism to laboratory areas for pharmaceutical companies to do research in the microgravity environment of space.



Off Highway 303 just outside Dallas, **Joe Zinecker** (1982 BSEE, 1985 MSEE) is another innovator. He is overseeing a project that may very well change the way the country wages war.

Resting on a half-mile track, and clad in tan camouflage, is the culmination of close to six years of his work. Known as the MULE (Multifunction Utility/Logistics and Equipment) vehicle, this robot is the only one of its kind in the world.

Weighing in at 3.5 tons, it is a prototype of the Transport MULE one of three types of robotic vehicles Zinecker and his team of more than 130 engineers is creating for the United States Army's Future Combat Systems Program.

On a recent morning, Zinecker, program director for the Future Combat Systems MULE Program at Lockheed Martin, and a few of his engineers, were using the prototype to show off just what makes the MULE unique.

Approaching the pickup-truck-sized prototype at Lockheed Martin's Robotics Testing Center, Zinecker gestures at its body—constructed of bulletproof material and held up by six airless tires. The tires, he explains, can take a blow from a landmine or bullet and still push on. They are fitted onto wheel hubs that are each powered by an electric motor. "See how those shoulder joints move?" said Zinecker. "There is a motor in each one of those shoulder joints that allow it to do almost exactly what you would do if you were climbing over an obstacle. It can squat its rear end down and shimmy on its belly over a barrier or put its suspension all the way down on the ground so it can hide in the bush or the grass. It can make it over 1.5 meter gaps or articulate over the jersey barriers found on highways and it can get up high to tiptoe over rocks or stumps."

Joe Zinecker is the brains behind the prototype "animal," the only one of its kind in the world.



The robot's diesel electric propulsion system, which produces upwards of 50 kilowatts of power, is used to run the shoulder and wheel motors that allow this unique positioning ability. Leftover power is dedicated to operating different mission equipment packages on each of the three versions—the Transport, Countermine and Armed Robotic Vehicle Assault MULEs. This is in addition to powering sophisticated sensors and image-processing systems capable of allowing these robots to see the edges of roads, rivers and other obstacles as they navigate.



"The most important requirement of the MULE is that they must be carried by the CH-47 Chinook helicopter," said Zinecker. "This drives every aspect of the MULE's design, from the use of special aluminum alloys to the design of lightweight electrical cables."

Together, the three models capable of controlling themselves autonomously or being controlled by

a soldier using a common controller will ease many jobs that unnecessarily put the lives of American soldiers at risk all while making the Army a lighter, more mobile fighting force.

"The dull, the dirty and the dangerous; that's what robots can do," Zinecker explains. "We are saving soldiers lives and streamlining operations with these machines."

How? For troops currently stationed in Iraq and Afghanistan, the danger is not always what they can see, but what they cannot. Thousands of landmines scatter the ground, especially between the border of Iraq and Iran. The most recent survey, conducted by the Red Cross in 2001, found mines hidden underground in Iraq resulted in about two dozen

injuries per month. Zinecker hopes to change all this with the Countermine MULE. This version is fixed with a forward facing arm that uses groundpenetrating radar to identify, tag and destroy mines. Even the larger more menacing mines, too risky to detonate, can be identified, marked for only U.S. soldiers to see, and programmed into digital maps for future convoys to avoid.

is confident in their design.



And for the dangers soldiers can see, his team has created the Robotic Armed Vehicle-Assault MULE. This is one of the only robots out there that will be equipped with live ammunition—both a machine gun and Javelin missiles. Though still a relatively uncharted territory for unmanned ground vehicles, Zinecker "You think robots with guns may be a little scary, a little terminator-like," Zinecker said. "Well, you would be amazed at the amount of software and the amount of thought that goes into making sure there is no possibility the robot will decide on its own when to shoot."

Beyond this model's ability to fire a weapon, it is designed to assist with reconnaissance, surveillance and target acquisition. This means the vehicle can drive itself to a location and use its sensors to feed back information about the area via streaming video. It even has the ability to notify soldiers if it detects something out of place.

As for the third model, there is little question as to what purpose the Transport MULE serves—it is the workhorse. At Lockheed Martin's test facility in Grand Prairie, Texas, the prototype of this model is loaded down with rucksacks, boxes and shoulder holsters for Javelin missiles that test its 2,000-pound cargo capacity. Rather than risk the lives of soldiers, it is designed to haul supplies hundreds of miles away, on its own, with the push of a few buttons.

For Zinecker, the versatility of the three models, and their closeness to completion has him excited.

"Can you picture it?" Zinecker, a nearly 25 year veteran of Lockheed Martin, beams. "These big convoys that happen in Iraq and Afghanistan—in the future they will include mostly robots."

Zinecker's team is scheduled to send their first MULEs to the Army in late 2011. Throughout the course of the next two years, these 20 MULEs—a combination of all three models—will be tested at various military facilities before beginning production in 2013. By 2014, MULEs could be carried by helicopter to combat zones across the world.

About 250 miles south of Zinecker in Houston, a trio of university graduates have engineered a way to rescue the technological brains behind most major companies: data centers.

For years, these facilities—responsible for housing the computer components that make business in the 21st century easier—have been reaching limits in space, power and cooling. That's why **Wade Vinson** (1995 BSME), **Michael Hanson** (1999 BSEE) and **Bruce Mumma** (1986 BBA) helped develop Hewlett-Packard Company's Performance-Optimized Datacenter, also known as the HP POD. It's a device that not only solves the three problems, it does so portably.

"Customers continue to deploy high density hardware to gain better performance, which pushes data centers to their power and cooling limits, often impacting business growth," said Vinson. "As customers look to gain a competitive edge by leveraging the latest technologies, they continue to face severe space constraints. The HP Pod offers innovative IT infrastructure solutions that can support a broad range of hardware while maximizing physical space and better managing energy consumption."



their center go offline as builders work to accommodate the special environmental provisions that can drag out data center builds as long as two years.

The HP POD, however, is selfcontained and can be used in the interim while building is going on or it can be fully loaded with racks of computer servers and shipped as a more permanent solution, each within six weeks. "You get rid of the compromises that are necessary for people and computers to live together," said Hanson of the device.

Not only is the roughly 100,000-pound HP POD weatherproof—allowing the versatility to be placed outside or in a warehouse—it has a unique cooling system that helps make it incredibly powerful despite its compact size. "When you look at typical data centers, the ability to deliver the power neccessary and the cooling to run that kind of power are basically both limited; you are delivering somewhere around 200 watts per square foot," said Vinson of the HP POD they helped craft to come in 20 or 40 foot lengths. "With the HP POD, our power capacity per rack is 27 kilowatts which translates into about 1,800 watts per square foot." This sets it apart from some of the other companies with portable data centers that compete with the HP POD because, even though it is more powerful, its design makes it a more efficient, greener technology.

"A recent report by the U.S. Environmental Protection Agency branded a typical data center with a power usage effectiveness of 2.03," Vinson said. "So that means for every

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watt of computing, you must spend another whole watt in order to get the power and cooling necessary to run it. With the HP POD, we are as low as 1.25—half of the energy traditional data centers use."

Though it mimics standard data center layouts—with all the server racks arranged with a hot aisle in the back and a cold aisle in front—the trio claims their cold aisle can run at 90 degrees and utilize 65-degree water for cooling. That is close to 20 degrees warmer than the norm.

Just like air conditioning in your home, the cool water is used to help remove the heat that the servers create in the small space and bring it outside. So whatever power goes in as current has to come out as heated water. Their use of three-phase power and rubberized seals between the racks adds to the HP POD's dispersal of heat, increasing its energy efficiency.

"The way we have done the cooling distribution we think we have a solution that is the most power dense out there," Hanson said of the HP Pod, which was introduced in January 2009. "It helps businesses reduce their cost and expand their capacity all while being energy efficient."

> To see Genesis I and Genesis II orbiting in space, the MULE in action and a multimedia piece on the HP POD, visit *The Cougar Engineer* online at www.egr.uh.edu/ cougarengineer.

FEATURE

Spotlight

Gracious Graduate By Erin D. McKenzie

UH Engineering Education Helped Alumnus Climb to Top of Baker Hughes Incorporated

Ron Turner (1958 BSPE/BS Math, 1967 MSPE) will be the first to tell you he is not ashamed of what his education helped him achieve in the petroleum industry.

A native Texan, the 73-year-old climbed his way up the ladder of the reservoir consulting and product and services company, Baker Hughes Incorporated, serving as their vice president for 11 years. His work even earned him recognition from *Institutional Investor Magazine*, which named him the best corporate representative in the oil service industry five consecutive years leading up to his 1993 retirement.

"I could not have done what I did without the education I had at UH," said Turner, who graduated cum laude. "I thoroughly enjoyed the work that I did, and it was because I was well educated."

The choice to pursue a petroleum degree and dive into the rich business of crude oil, Turner says, was simple. Not only did he live in Houston, the energy capital of the world, but also he saw how much the industry was changing following the Suez Canal crisis that stopped the import of oil to the United States in the 1960s.

"I wanted to work in the service industry because the U.S. changed after the Suez Canal crisis," Turner explained. "The oil companies realized they didn't have any service capacity. They needed new ways of doing things."

So after graduation Turner signed on with Great Lakes Petroleum Services as a reservoir engineer, where he found more efficient ways of recovering oil. He would stay with the company until they closed down operations five years later before taking his talent to Baker Oil Tools. There, he quickly moved on from design engineer—taking the titles product engineer, chief product engineer and chief engineer before becoming the vice president of research and engineering.

Then a series of articles Turner wrote communicating the complexity of the oil business for the company's internal magazine would get him noticed. The chairman of Baker's board of directors as well as the company's CEO wanted to meet him. It is an appointment that would result in Turner's transfer to California, and by 1982 earn him the title as vice president of Baker International Corporation. During his tenure, the company would merge with Hughes Tool Company to take on their current name—Baker Hughes Incorporated. Work would call him back to Houston in 1987, five years before retiring from the company at the young age of 57.

"I am certainly not ashamed of how things turned out," Turner, who now resides in La Quinta, Calif. with wife, Paula, said. "I had some success, made enough money and earned enough honors to be satisfied."

Since his retirement, Turner has served as a trustee with the R.C. Baker Foundation, an Orange, Calif.-based philanthropy organization started in honor of Reuben C. Baker, a company founder who helped revolutionize cable tool drilling in the early 1900s.



Gracious Graduate

SPOTLIGHT

Photos Courtesy of The Seattle Museum of Flight



By Erin D. McKenzie

Alumna Honored With Prestigious Medal

In her post as President and CEO of Seattle's Museum of Flight, Bonnie J. Dunbar (1983 PhD BioE) opens people's eyes daily to the accomplishments of creative minds.



Through exhibits, visitors learn about the engineers who design the equipment pilots have flown across the country and to space. Outside museum walls she shares with communities and schools how these individuals changed the face of the nation.

It is part of why the American Society of Mechanical Engineers (ASME) selected her as their 2009 recipient of the Ralph Coats Roe Medal.

"This is one of the most prestigious awards given out by ASME," said Barry Hyman, the chairman of ASME's committee for the Ralph Coats Roe Medal. "There are few who gualify, but Bonnie more than earned the recognition for being a role model as a NASA astronaut in five shuttle flights, for leading as a senior NASA administrator and for inspiring and educating the public about the nature and history of aerospace technology."

Since the honor was established in 1972 for Roe, an innovator in the design and construction of highly

efficient power plants and advanced desalting processes, it has recognized individuals contributing to a better public understanding and appreciation of engineers' worth to society.

Given at most once a year, 33, including Dunbar, have received the honor since its inception. They include one other former astronaut, writers, industry professionals and political figures.

"I am honored and humbled," said Dunbar of the award she accepted at the International Mechanical Engineering Congress in November. "Being a professional engineer who has had the opportunity to work on and to solve problems that are important to our nation has been a fulfilling and rewarding career. I am deeply grateful to the ASME and to the family of Ralph Coats Roe for this recognition."

After earning both her bachelor's and master's degrees in ceramic engineering from the University of Washington, Dunbar eventually became a senior research engineer with Rockwell International Space

Division. She joined NASA as a flight controller in 1978. Two years later, she earned the title of astronaut where she logged more than 1,208 hours in space on five missions aboard shuttles Atlantis, Challenger, Columbia and Endeavour.

She went on to serve as a senior NASA administrator in 1998. For five years she was actively involved in the agency's educational and grant programs before serving as associate director of technology integration and risk management prior to retiring from the space agency and accepting her current post in 2005.

Since taking over leadership of the Museum of Flight-one of the largest air and space museums in the world—it has achieved notable successes including its designation as an affiliate of the Smithsonian Institution in 2007. The recognition allows the Museum of Flight to access more than 136 million objects housed by the Smithsonian that can be incorporated into its own exhibits.

Class Notes

1960s

Douglas Posey (1969 BSME) is director of apprenticeship programs at Houston Community College.

1970s

Tim Headley (1971 BSEE) has launched a solo practice as a patent, trademark and copyright lawyer.

Ray Ayers (1973 PhD CE) received the Silver Patent Award from the American Society of Mechanical Engineers' Petroleum Engineering Division. He handles deepwater consulting projects for Stress Engineering Services. Previously, he spent 31 years at Shell Oil Company working with pipeline repair, synthetic fiber mooring systems and seismic noise reduction research programs.

Imran (Ron) Toufeeq (1976 BSME, 1978 MSME) has been promoted to senior vice president of operations, asset management and engineering at Pride International Inc., one of the world's largest offshore drilling companies.

Bobby Grimes (1979 MSME) received the Exceptional Volunteer Award from the American Society of Mechanical Engineers' Petroleum Engineering Division. He is the manager of technology services at Hughes Christensen, where he has been employed since 1979. He also serves as vice president of the ASME International Petroleum Technology Institute.

1980s

Reuven Hollo's (1980 BSChE) company Aries Resources LLC has formed a new venture with Energy Special Situation Funds called Aries Energy LLC. The company was formed for the strategic

purpose of acquiring and developing mature oil and gas properties.

Darren Smith (1981 BSEE) is a systems engineer for Entropic Communications in San Diego, Calif.

Kevin Smith (1981 BSEE) is a in Austin.

1990s

Bill Ramsev (1993 BSChE) has been promoted to global industrial and consumer market manager for the specialty elastomers business at ExxonMobil Chemical.

Mark Janzer (1995 BSCE) and Mehdi Nezami (2004 BSCE) have been responsible for the infrastructure design of several U.S. embassies in Africa, the Middle East, Eastern Europe and the Pacific Basin. They have also been responsible for the infrastructure design of the King Abdullah University of Science and Technology (KAUST) campus. This mega-project was recently awarded an LEED Platinum certification. Janzer is a project manager and Nezami is an assistant project manager in the International Division at LJA Engineering & Surveying Inc. in Houston.

Yasir Kazi (1995 BSChE) is working on his Ph.D. in Islamic Studies at Yale University.

Jim Keck (1995 BSChE) and wife, Amv. welcomed twins, William Thomas and Audrey Catherine, on June 8, 2009.

David Hofman (1996 BSME) is intellectual property counsel

for Schlumberger.

Alfred Castillo Jr. (1998 BSCE, 2002 MCE) and wife, **Diana** (1998 BSCE), welcomed their third child, Jeselle Alyn Castillo, on May 22, 2009. She weighed

University of Houston Cullen College of Engineering

staff engineer for Silicon Laboratories

8 pounds, 2 ounces. Alfred is now construction/turnaround labor sourcing manager for North America within the purchasing organization of The Dow Chemical Company.

Ahmad Shaheed (1999 BSME) is a project manager for EPCO Inc. He is managing the engineering, permitting and installation of 43 miles of natural gas pipelines in Fort Worth, Texas and another 17 miles in East Texas.

Jason Wolfe (1999 BSChE) earned a skydiving class-A license from the United States Parachute Association and is working on his private pilot certificate to fly single-engine fixed-wing aircrafts.

2000s



Avelino Reyes-Alfonso Jr. (2001 BSChE) welcomed a daughter, Alezzandra Sofia Reyes, on July 28, 2009. She weighed 6 pounds, 10 ounces.

Casey Broxson (2003 BSCE) married Thomas Hensley on Feb. 15, 2009. Casey is an environmental engineer for Questar Inc.

Morad Kabiri (2004 BSIE) is now director of community development as well as the city engineer for the city of Friendswood.

In Memoriam

Emmet Owen Bammel Jr. (1950 BSME) died June 26, 2009.

J.L. Jones Jr. (1950 BSCE) died Aug. 15, 2009.

Debra Dunlap (1980 BSChE) died Nov. 5, 2009.



PC Pioneer [Alumnus helped change the way the world computes]

By Erin D. McKenzie

Of all the impressive technologies that drive our modern world, perhaps the most indispensible is the personal computer.

Touching most aspects of everyday life, computers allow businesses to track inventory, control temperature and lighting in offices, offer the ability to communicate through e-mail, even work out complex mathematical problems.

But the computer's ability to so easily serve as an accessory in our home offices, briefcases, libraries and college lecture halls was no small feat.

In the late 1970s, when personal computers were first finding their way into homes, they were nothing more than expensive, oversized typewriters. That was until a company, co-founded by **Joseph "Rod" Canion** (1966 BSEE, 1968 MSEE), challenged the way things were done.

Canion, Compaq Computer Corporation's first CEO, pushed the technological envelope during the company's early years and not only created many of today's computer industry standards, but also kept companies motivated to continue developing better PCs.

"Back then, the computer industry was headed in the opposite direction of what it is today," said Canion, reminiscing from his home in Houston's River Oaks area. "Compaq really deserves credit for turning the industry around by establishing a standard for which all the PCs, except Apple, basically ran the same software." PC Pioneer

LEGACY





Compaq's first portable computer was introduced in November 1982. The two floppy disk system weighed 28 pounds and cost \$3,590.

// Early Beginnings

A love of math and the University of Houston's close proximity to his parent's home led Canion to UH. A physics class he enrolled in his freshman year turned him on to engineering, and by 1968 he had graduated magna cum laude with both his bachelor's and master's degrees in electrical engineering.

Within weeks he started what would be a 13-year career with Texas Instruments. It is where he would meet Jim Harris and Bill Mutro, the other co-founders of Compaq. After collaborating on several projects, the trio would eventually start talking about starting a business of their own. And in 1981, with IBM's introduction of a PC, they saw their opportunity.

"There was an electricity associated with the announcement that IBM was coming out with a PC," Canion recalled. "It was an exploding market and we had to get in there and do something."

So they each anteed up \$1,000 to realize their dream—the creation of a computer disk drive for the new IBM PC. But when their funding deal fell through just one week after they quit their jobs, the budding entrepreneurs were back to the drawing board. But it would take Canion just a few weeks to come up with something solid again—a portable computer more stylish and rugged than existing units that would not only compete with IBM, it would run all the IBM software.

It was a tall order.

At the time, computer software was not compatible between companies and IBM had cornered the market on Microsoft. So Canion had some bargaining to do.

"I remember sitting down with Bill Gates in the back room of a party at a conference in San Francisco and showing him the sketch of the portable and telling him how important it was that we had it run their software," Canion said. "I think they saw that with IBM as their sole large customer they were not nearly as powerful as having a lot more equal customers, so they committed to it."

Canion then rounded up Intel to ensure Compaq would have the same microprocessors as IBM and got to work reverse engineering IBM's computer. They needed to work around IBM's ownership of its basic input/output system (BIOS) code to develop its own BIOS—a necessity for them to maintain the legality of creating a compatible computer.

The next month, in February 1982, the trio convinced Wall Street-analystturned-venture-capitalist Benjamin Rosen to help raise the money needed to produce their vision and Compaq was born. They introduced their portable PC that same year, shipping more than 53,000 units and setting a record for a first-year American business by recording revenue of more than \$111 million.

"It was like you realized you had climbed onto a rocket ship and couldn't get off," he said, speaking of his time as CEO during Compaq's first years.

// On the Public's Radar

In the years that followed, Compaq continued to set records. Canion credited his decision to sell his PCs solely through computer stores as one of the key factors that allowed Compaq a fighting chance in the industry.

"Nobody else was doing that at the time—going exclusively through dealers," Canion said. "As a result of that choice, we became the third computer behind IBM and Apple and were in 90 percent of the computer stores." During his time as CEO, Canion and Compaq's successes were featured on a number of magazine covers including *BusinessWeek, Inc., Electronic Business* and *Houston Metropolitan*.



In 1984, Compaq took another risk after IBM introduced a competitive portable and Apple debuted their Macintosh. Rather than sticking strictly to portable computers, Compaq used their reputation to showcase their first desktop model.

The Deskpro line, based on Intel's 8086 chip, shipped close to 150,000 units by the end of that year and set a revenue record of \$329 million.

Two years later, Compaq would move ahead of IBM, beating them to the market with their Deskpro 386. It was the first to use Intel's 80386 chip and bring the current 16-bit architecture to 32. At four million operations per second and four kilobytes of memory, it gave PCs as much speed as old mainframes and minicomputers.

"That put us on everybody's radar screen," he grinned, noting its introduction doubled their sales. "We had challenged IBM and won."

Compaq continued reaching milestones, becoming the first company to achieve Fortune 500 status five years after it was founded. Company revenues were on the rise, too. They reached \$3 billion in 1989 while other PC manufacturers including Apple—had setbacks.

Prior to stepping down as CEO in 1991, Canion would help earn Compaq one more victory with the introduction of the Deskpro 486. It was a PC based on an Enhanced Industry Standard Architecture (EISA). The EISA hardware design, which Compaq led efforts to develop with other PC makers, challenged IBM's micro channel hardware design for their PS/2 PCs. It allowed them to avoid paying a fee to IBM for their micro channel technology and helped Compaq to set industry standards.

"All the rest of the industry offered a better product than IBM's PS/2," he said. "We had to go up against IBM and organize our competitors to follow this evolution of the existing standard. What we created was a standard that everybody benefited from, especially the consumer. It gave us a faster PC with the ability to perform complex operations such as networking and multitasking."

// Legacy of Entrepreneurship

During his nine years with Compaq, Canion built the company into a personal computer powerhouse. A year after leaving, he would take this business savvy and launch the information technology company, Insource Technology Group, where he served as chairman until 2006.

"In the late 1990s, I began to become more involved with early stage companies and really realized that I enjoyed using what I had learned at

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Compaq," he said. "Now I provide not only money to these companies, but I also offer them my experience and advice with start-up issues."

Through membership in the GOOSE Society of Texas, a loose knit group of successful entrepreneurs, Canion has invested in a half dozen companies. And with other entrepreneurs, he has provided funding and advice to the winners of the Rice University Business Plan Competition for the last five years.

Currently, Canion serves as chairman of Questia Media Inc., a subscriptionbased searchable liberal arts web library, and director of the Houston Technology Center, a non-profit that helps technology companies in the Houston area. This is in addition to sitting on the board of directors for ChaCha Search Inc., Invesco Ltd., Physician Capital Group and Auditude—all companies he has personally invested in.

For this man, who changed the way the world computes, mentoring others who aspire to change the way things are done is more than fitting.

"I believe the entrepreneurial spirit and venture capital infrastructure we have in America are very important to our future," Canion said. "Helping more start-ups succeed is something I can do to help."

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COUGAR PRIDE

y day, **Jim Kaucher** (1973 BSME) is the plant manager at Cheniere Energy's Sabine Pass LNG Terminal in Cameron, La., but catch him at Robertson stadium and he is one of the most devoted Cougar fans you may ever encounter.

Fully adorned in red, Kaucher and his wife, Lynn, are among the first to arrive at the tailgate field and among the last to leave the football stadium. A season ticket holder for more than two decades, Kaucher never misses a home football game, travels to an away game a year and has been known to set up his tailgating



Right now is a great time to be proud UH alumni!

The football team ranked in The Associated Press Poll of the top 25 NCAA Division 1 college football teams for the first time in almost 20 years. Research expenditures are higher than ever and voters in November passed a constitutional amendment to establish a National Research University Fund with the goal of helping turn UH and six other Texas universities into top tier schools.

In recognition of these accomplishments, *The Cougar Engineer* plans to highlight some of its most dedicated engineering Cougars in upcoming issues. If you know a graduate like Kaucher, send us a note at cougarengineer@egr.uh.edu.



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tent and other gear in his living room for a televised game.

Step into his Louisiana home overlooking Constance Beach or his second place in Katy, Texas and there are rooms devoted to his alma mater. Each are peppered with signed photos, blankets, shirts and helmets—one even has a handmade UH nightstand. In his driveway he has a red pickup truck and a golf cart emblazoned with UH decals he calls "the Coog."

Why all this? It is simple says Kaucher, "I am very proud of where I got my degree."

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The University of Houston campus is changing. The new meditation pond (above) that sits outside Engineering Building 2 is one of many new additions across campus. Come visit your alma mater and see all the exciting campus beautification and expansion projects underway at UH!