

NEWS


News Blurbs Now! (NBN)

University at Buffalo Assistant Professor Andreas Stavridis has received a \$24,040 grant from the National Science Foundation for earthquake research. The grant is being used to study the architectural and structural response to seismic activity in regards to the April earthquake in Nepal. Data will be used to evaluate current US guidelines for assessment of existing structures and will benefit the recovery and rebuilding efforts in Nepal. His team will be focusing on masonry structures, especially buildings in close proximity to each other where one building failed and the other did not.



Project Engineer. Visit www.zodiacaerospace.com/en/candidates/our-jobs for additional information.

Job site robots may be coming your way in the future. Researchers at UB are conducting prototyping to find the robot that will work best on the construction site. Building information modeling and smart glasses would be used to connect workers to robots.

 **TRAUTMAN ASSOCIATES** ARCHITECTS / ENGINEERS
Trautman Associates' Vice President John Daly PE was the recipient of the Rev Thomas E Fleming, SJ Distinguished Service Award by Canisius College's Board of Directors of the Masters Business Alumni Association (MBAA). Daly has served on the Board of Directors for MBAA, mentored other MBA candidates, and has also served on their science advancement committee.

of Directors of the Masters Business Alumni Association (MBAA). Daly has served on the Board of Directors for MBAA, mentored other MBA candidates, and has also served on their science advancement committee.

Thomas R Gilmartin PE, LEED AP (Principal Engineer at RJR Engineering, PC) recently attained the credential of Project Management Professional through the Project Management Institute.



Picone Construction Corp has completed partition, door, window, ceiling, lighting, and electrical improvements to St Mary's School for the Deaf Video Lab. The Architect of Record was Conway and Company Architects. Picone also continues to work on worship facilities with door, archway, lighting, and sidewalk updates for Saints Peter and Paul RC Church in Wmsvl.

Zodiac Oxygen Systems is hiring for a Design Engineer, Program Manager, and Systems



A research team at Germany's Ruhr-University Bochum has developed an improved method of tunnel fire protection. By infusing steel fiber into the shotcrete used on the surface of the tunnels, the ability to withstand fire and explosive blasts is markedly increased. An accelerating agent added to the shotcrete mixture, as it is applied with a high-pressure nozzle, allows it to be installed in thick layers, increasing the shotcrete's compressive strength.

The National Council of Structural Engineers Associations (NCSEA) has partnered with Kaplan to offer a live online Vertical Load SE Review Course. The next session takes place August 15-16. A Lateral Load SE Review Course will be taking place in September.

The National Wireless Safety Alliance (NWSA) and the National Commission for the Certification of Crane Operators (NCCCO) have announced that they have entered into a professional partnership for the development and administration of nationally accredited certification programs. This alliance will make the partnership's CCO Signalperson and Rigger certification programs the first official certification programs to be made available by the NWSA to the telecommunications industry.

Consulting-Specifying Engineer Magazine is sponsoring a free 30 minute webinar titled "How to Thrive in the Non-Traditional Engineering World" near the end of August. Sign up at csemag.com.

Did you know that The Center for Innovation, Testing, and Evaluation plans to construct a city in the New Mexico desert? The city will be uninhabited and will be used as a testing ground to assist with innovations in infrastructure systems-energy, water, agriculture, etc. Complete, built to scale and code compliant roads, schools, and buildings will create a great testing ground for new technologies.

Visit <http://r.smartbrief.com/resp/gKaNCrsecuxCuknRXCfm> to see a picture of a bridge made from only 22,000 sheets of paper. Arched bridge – no glue, cables, steel, or magic required.

We need your news blurbs NOW! We want to know about your recent projects, awards, hires, promotions, patents, new products, partnerships, open houses, tours, and anything else you'd like to share. Send your news to ESB1894@gmail.com.

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TECHNICAL ARTICLE

What Are Soft Skills And Why Are They So Important? By iLead India

Most people are still not clear about what soft skills mean. Frankly, the term itself was coined just a few years ago. In any job, the sole importance was given to the candidate's resume and what his qualifications were. But nowadays, a lot of stress is being laid on the candidate's soft skills and if he is properly trained in them.

So what are soft skills? It is hard to be exact in this case, but it essentially is a method to judge a person's performance, leadership ability, and team spirit. Hard skills constitute your educational qualifications and previous job experience. In fact, a lot of recruiters are now paying more attention to soft skills rather than the hard ones. A lot of candidates with impressive resumes but poor soft skills have been rejected in the final rounds of interviews.

That is why you should enroll in soft skills programs in order to develop these skills. Soft skills can be classified into these categories:

~Negotiation~ This is a very crucial soft skill that you need to possess. The art of negotiating a deal with a client or even negotiating with a co-worker is something that you need to master effectively. There is no hard and fast rule about mastering this aspect but you will be trained to negotiate to the

fullest of your capabilities.

~Team building~ Instilling team spirit in the members of a team is perhaps the most difficult task ever. Ego, personal rivalry, office politics, and various other factors come into play and you have to overcome all these hurdles and utilize all the resources efficiently. This is known as team building and it requires some training beforehand.

~Communication~ Last but not the least, you need to communicate well with your superiors and peers. If you can't express your thoughts or grievances in the proper manner, then it will soon begin to affect your performance. Honing this particular soft skill is all the more important when you are talking to clients of the company.

Looking for an institute that offers soft skills training? There are quite a few reputed ones that are providing such training for extremely reasonable fees so it should not be difficult for you to find one. Just make sure that the institute has a good name in the market and also that it offers good job placements after the completion of the course.

iLead India has prolific writers who write on a wide range of topics pertaining to education, including higher studies, post graduate courses, academic institutions, MBA education, and more. Visit www.ilead.net.in. This article originally appeared at www.articlecity.com/articles/education/article_2519.shtml.

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CALENDAR OF EVENTS

| | | | |
|----------------|-------|--|---|
| 08-04-15 | 9am | ESB/Beam Golf Tournament | Chestnut Hills Country Club, Darien |
| 08-10-15 | 530pm | ESB Professional Networking Event | 359 Ganson St, Buffalo (Buffalo RiverWorks) |
| 08-22-15 | 8pm | ACEC/PAC Spirit of Buffalo Sail | 44 Prime St, Buffalo (Central Wharf, Canalside) |
| 09-14-15 | 6pm | Ways and Means Meeting | 2555 Walden Ave, Buffalo (Wendt Corp) |
| 09-14-15 | 7pm | Directors Meeting | 2555 Walden Ave, Buffalo (Wendt Corp) |
| 09-??-15 | | ISA Col Ward Pumping Station Tour & Discussion | |
| 10-22-15 | | Past President Dinner | To Be Determined |
| 11-06 to 11-08 | | Engineers Without Borders Regional Conference | Syracuse |
| 12-3 to 12-5 | | Construct Canada Exposition | Toronto |



NEXT BIG ESB EVENT

Buffalo RiverWorks Networking Event

Starting at **5:30 PM**, come and mingle with your professional colleagues.

Enjoy a warm summer evening on the south side of the Buffalo River.

Everyone is welcome to attend this **free** networking event.

Bring a friend, spouse, life partner, or any significant other.

Bring extra business cards to pass out to your new networking friends.

Bring cash or credit cards to pay for your own beverages & food.

buffaloriverworks.com

Buffalo RiverWorks is located along the south bank of the Buffalo River. It is the city's newest waterfront destination including sports, music, boating, and other entertainment.



Learn about how RiverWorks is planning and designing the first ever brewery to be retrofit into an existing grain silo. The former GLF Grain Silo will house the RiverWorks brewery. It will use direct tank-to-tap lines for the three interior bars. A fourth bar will be constructed next to the RiverWorks Beer Garden which will be constructed around the foundation remains of a different grain silo.

RiverWorks is located near General Mills at 359 Ganson Street, Buffalo 14203. From downtown Buffalo, travel south on Michigan Avenue. Cross the Buffalo River at the Michigan Avenue Bridge then turn left on Ganson Street. Turn into the Riverworks parking lot on the left, when you see the largest six-pack of Labatt's Blue!



RSVP your plans to attend this networking event to Rich Cartwright at rcartwright@usaenviro.com. He will be there early to reserve several tables. Dress code is business casual, comfortable shorts, etc.



Networking!

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TECHNICAL ARTICLE

Engineering For All

By Valerie Thompson

Engineering is enjoying a moment, thanks to the maker movement, a cultural phenomenon that encourages everyday citizens to design, build and create. "Making encompasses everything from electronics and robotics to woodworking and traditional arts and crafts," says Pramod Khargonekar, assistant director for Engineering at the National Science Foundation (NSF), "and the movement is poised to change the way we think about engineering—from where it happens to who can do it." Today's engineers are helping to drive many of the technologies that make making possible—from 3-D printers to user-friendly design software. As high fabrication costs and complicated computer programs become a thing of the past, young inventors and DIY (do-it-yourself) enthusiasts can focus on what really matters: bringing their ideas to life.

According to Leilah Lyons, first impressions of computer science and engineering count for a lot. "That's why museums are great places to give kids a chance to encounter these fields—there's more room to present the topics in engaging and playful ways," says Lyons, an assistant professor of computer science and the learning sciences at the University of Illinois at Chicago and the director of digital learning research at the New York Hall of Science, a hands-on science museum in Queens, NY. Together with collaborator Matthew Berland, an assistant professor of curriculum and instruction and member of the Games Learning Society group at the University of Wisconsin-Madison, Lyons is working to understand how activities like making can stimulate curiosity in STEM—science, technology, engineering and mathematics. With support from NSF, the team is testing a new exhibit at the New York Hall of Science, which weaves basic electrical engineering concepts into a virtual fishing game.

According to Berland, making has great potential as a tool for introducing kids to engineering. "Making lets kids practice a wide range of competencies that are critical to engineering, like problem-solving, hands-on skills and collaboration," says Berland. Research shows that an interest in engineering among young people during middle school can predict which students will ultimately end up in engineering careers. Early exposure to making can help students think positively about engineering at this critical age.

One of the ways that making could affect engineering is by encouraging underperforming students and kids who come from backgrounds that are underrepresented in STEM fields to picture themselves in these roles. According to the investigators, early findings from the New York Hall of Science's research on making include reports from teachers that a number of academic underperformers begin to exhibit sophisticated problem solving, collaboration and construction when engaging in making activities. "Making has immense power to engage learners who might not have seen themselves as engineers," says Lyons. The team hopes their research will shed light on how students begin to learn engineering concepts—from how long it takes to work through big ideas, to what they get hung up on. Because the exhibit allows kids to work side by side, they will also gather data on how collaboration and information-sharing affect the learning process.

The maker movement isn't just about generating excitement in informal settings; researchers also believe it may have a role in formal engineering education.

"There's something about the maker environment that encourages people to try again, start over and get it done, and also have fun," says Cindy Harnett, an assistant professor of electrical and computer engineering at the University of Louisville. Harnett and her colleagues have received funding from NSF to research how a semester-long internship at a local makerspace, a community workshop that enables members to pursue independent projects by providing access to tools and hands-on training, influences the confidence and creativity of students enrolled in undergraduate engineering programs. The results, so far, are very promising. Students enrolled in the program report increased confidence in their ability to solve engineering problems and a greater appreciation for the importance of project planning.

"Sometimes it seems like a switch flips, and a student suddenly jumps into research mode after years of trying to get the right answers on tests and homework," says Harnett. "If we can use the maker movement to get engineering students into the research mind-set sooner, that is a great benefit." According to Harnett, another unique aspect of makerspaces is that they are filled with different projects at many stages of completion and complexity—an important aspect of real-life engineering that's difficult to replicate in the classroom. "It makes me happy to see students learning about unexpected things they bump into at the space—subjects that are outside of their project domains," says Harnett.

Without the right tools, the maker movement would have had a hard time getting off the ground. According to Paul Wright, a mechanical engineering professor at the University of California, Berkeley, a number of things happened in the last 10 years that are making it possible for more people to create and build their own one-of-a-kind creations. "Simple microcomputers are less than \$100, 3-D printers have come down in price, design software is more or less free on the web," says Wright. These tools, conceived of and built by scientists and engineers, help young inventors "jump right in and do something," observes Wright.

That said, today's makers will need a little help if they hope to scale up their inventions for commercialization. With funding from NSF, Wright and collaborator Bjoern Hartmann are working to develop a web-based manufacturing service that they hope will help translate the creativity of students, hobbyists and inventors into products, and help launch new start-ups in a wide variety of consumer sectors. "If makers want to start a business and make their prototype into a product, they will have to make many more by the thousands and make the product user-reliable," says Wright. "We are providing free access to virtual-expert systems that advise on re-design for robustness, re-design for final assembly, et cetera."

To Wright, one of the best things about the maker movement is the message that creating things can be fun. "Engineering has always been that way for those of us on the inside," says Wright. "But maybe we needed another external culture to add a bit more sizzle."

Valerie Thompson, AAAS Science & Technology Policy Fellow can be reached at vthomps@nsf.gov or 703- 292-2545.

AUGUST BIRTHDAYS

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TECHNICAL ARTICLE

Engineering The Spark That Starts The Wildfire

By Sarah Bates

Hot metal fragments can be created from power lines, overheated brakes, railway tracks or any other manner of metal-on-metal action in our industrialized society. The particles can reach more than 5,000 degrees Fahrenheit, around the boiling point of most metals. Although these bits cool as they fall to the ground, they can ignite a flame that quickly spreads if they land on a prime fuel source like pine needles or dry grass. At least 28,000 fires occur each year in the United States due to hot metal hazards, according to a 2013 U.S. Department of Agriculture report. For instance, in 2007, a spark from power lines traveled over the wind and landed in dry grass near Witch Creek Canyon in California. Days later, 1,100 homes and 200,000 acres had burned, with \$1.8 billion in losses.

Some human-caused ignitions are on the decrease, such as those caused by cigarettes and arson. But fires that bloom from stray particles continue to be a problem, particularly around mid-sized populations where there is just the right cocktail of civilization and natural fuels. Engineers supported by the National Science Foundation (NSF) are learning what ingredients and conditions cause this type of fire-starting, known as spot fire ignition.

Anyone who has ever tried to light a campfire knows making fire involves a lot of variables. Combustion is essentially a chemical reaction that's determined by temperatures and material makeup. For spot fire ignition, the situation becomes more complex, because environmental conditions play a big role. "The least understood aspect of the spot fire problem is what happens after a particle lands on a fuel bed," said Carlos Fernandez-Pello, mechanical engineer at the University of California, Berkeley. "The other two parts of the process, particle generation and particle flight, have been relatively well-studied."

Fernandez-Pello and his team mixed metal types and sizes, fuel bed characteristics and wind conditions to see what combinations create fires. Using elegant tabletop experiments, the engineers experimented with a variety of metals and fuels, attempting to replicate real-world conditions. "Obviously, a study of this complexity is difficult to conduct," Fernandez-Pello said. Brass, stainless steel, copper and aluminum ranging in size from roughly a pencil tip to an eraser were heated to temperatures from 1,100 to 2,200 degrees Fahrenheit. The metals represent those used in activities or events that are known to

cause fires, like welding, drilling, metal-cutting and power surges. In reality, some fragments get even hotter, but the researchers were limited by lab equipment. The metals were then flung into beds of barley grass, pine needles, shredded paper and ground grass and paper --similar to fuels found in the wilderness. "One of the most difficult experimental challenges was finding ways to make consistent fuel beds, ensuring the same density and moisture content," said Berkeley graduate student researcher James Urban. "Another difficult part was videotaping the ignition events, which usually happens less than a tenth of a second after the hot particle touches the fuel bed."

The engineers found relatively large fragments could ignite blazes even at low temperatures, if the fuel was of a certain type. Large shards might come from overheated vehicle brakes, bearings or result from sloppy welding. Small fragments, although more likely to be produced, required higher temperature to ignite fires. The size, shape, and arrangement of the individual fuel pieces (e.g. needles, grass, shredded paper or grind size) also mattered. The finely ground, dried wood caught fire most easily. Ignition required a minimum fragment temperature that depended on the fragment's size and the fuel characteristics. The data can help inform computer models that predict fire likelihood based on weather, particle, and fuel bed characteristics. "Enhanced fire spread models could give land managers and government agencies better tools to take preventative measures," Fernandez-Pello said.

Selective clearing around highways and railroads is one form of fire prevention. Planners often err on the side of caution, understandably. But with more accurate models, more strategic city planning could save trees and prevent forest fires, which is something Smokey can get onboard with.

The results also have uses beyond wildfire prevention. "The ignition of transportation and rocket fuels share many similarities with wildfire fuels," said Ruey-Hung Chen, program director in NSF's Division of Combustion and Fire Systems, which helped fund the research. "The wildfire ignition research can benefit a wide range of combustion applications."

Sarah Bates can be reached at sabates@nsf.gov or 703-292-7738.

Local/Online PDH Opportunities

For additional information regarding these opportunities, contact our office at ESB1894@gmail.com or 716-873-4455. Discounts for some pricing are available for certain society members, small companies, etc. And if you have information regarding future PDH opportunities that may be of interest to our members, please forward them to our office for inclusion in the newsletter and on our website at www.tesb.org.

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Atari Trash Or Treasure

By Robin M Closs SE PE

Have you ever heard stories of 3.5 million copies of the Atari game E.T. being dumped into a landfill in the middle of the night and encased in concrete to try to hide the game's failure? There are many myths surrounding what and if Atari actually disposed of their video games. In April of 2014, a landfill was dug up and there were in fact Atari games in there...but why are we so interested in silicon and plastics that have been underground for so long? There were gaming archaeologists (what???) on site for this "once in a lifetime moment" in video game history.

The word Atari is derived from Japanese and means something like success or to hit the target. Atari was THE system to have back in the day but 1985 brought a different story. The video game industry hit a massive recession when revenue dropped almost 97% between 1983 and 1985. Would you be able to survive with a 97% reduction in your income?

The internet is full of stories, some mythical, some based in truth regarding the discarded video games. The real reason for the dumping seems just to be that Atari closed a plant in Texas so that manufacturing could be moved overseas. The games were dumped simply as a tax write off of unsold goods. An Atari spokesperson was quoted in The New York Times during this period so the actual dumping shouldn't really be in

question. But still many conspiracy minded people believe that someone or some company planted the cartridges for this dig.

Some E.T. games were found in the landfill, but other games were found too. Unfortunately, archaeologists said that there was no way to estimate exactly how many games were buried. How frustrating! Shouldn't gaming archaeologists figure out a way to estimate this? And they couldn't determine the *real* reason the games were dumped either. Well, I guess I can forgive them for that one.

"Very few people have ever played E.T. for Atari," said Ian Bogost, a professor at Georgia Tech and author of *Racing the Beam*, an Atari history book. "The idea of things is more important than their reality. The idea of the game is what this [excavation] is after, though, not the game itself...once you find it, then what? Then you take Instagrams, that's what."

The mystery behind the video game dumping may in fact be more interesting than the actual truth. Some people even want to own one of the trashed games. What do you think? Are you going to search the web, read more articles, do more research regarding this treasure, I mean trash, I mean stuff?

Robin M Closs SE PE is a past president of The Engineering Society of Buffalo and a licensed structural engineering. She can be reached at clossr@yahoo.com or at Nardin Academy where she will be teaching engineering beginning in September.



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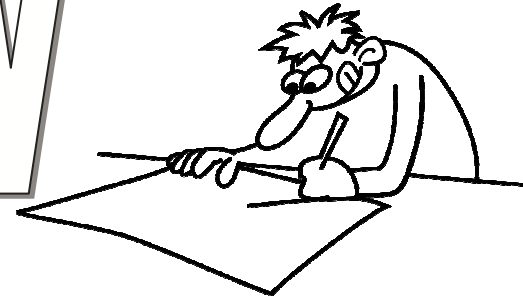
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Three Of The Most Common Delegation ‘Ah-Ha’s

By Scott Eblin

One of the biggest shifts that most rising leaders have to make is the shift from being the go-to person to someone who builds teams of go-to people. As you take on more and more scope in your leadership role, you can't continue to operate as the go-to person who acts as if you're personally responsible for everything that happens. You need to be accountable and own the results but you can't expect yourself to do everything that leads to the results.

That, of course, means that you need to be really effective at delegation. Unfortunately, a lot of leaders aren't that good at it. Too often, they delegate something to a team member and it doesn't get done well, or on time or at all. One of the big reasons this happens is because too many leaders take a "one size fits all" approach to delegation. Effective delegation needs to be custom-fit to the people involved and the tasks that need to be accomplished.

That might sound like a lot of work, but it doesn't really have to be. For several years now, I've been teaching the executives in our leadership development programs how to use a simple delegation checklist I came up with called TRACK™. Using the TRACK checklist, a leader can come up with a really clear picture on how to custom fit the delegation by considering:

- the what's and why's of the Task,
- how to make a clear delegation Request,
- what full Achievement would look like,
- the depth and frequency of Check-in's needed along the way
- and the Knowledge and Kudos that should be gained and shared as a result of the work.

Given time to think about and practice their delegation techniques, the leaders I work with come up with some pretty big ah-ha's about what would make

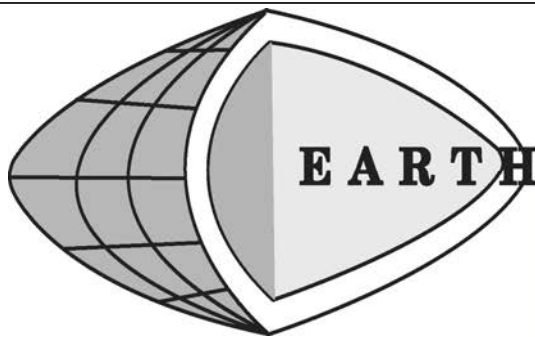
them more effective in sharing the work with their teams. Here are three of the most common delegation ah-ha's:

A little bit of prep goes a long way: Going through the TRACK checklist only takes around five minutes and creates a set of talking points for an effective delegation conversation and plan. Most of the leaders I work with are surprised by how much value there is in taking five to ten minutes to think through a delegation conversation rather than just jumping into it.

It's not about me: When they practice their delegation conversations with some peers, many leaders are surprised and a little chagrined to hear how much they're talking about themselves in the conversation. (As in, "This is why this is important to me," or "I need you to do this.") The leaders who have ninja level delegation skills are the ones who tune into "you" (As in "Here's what you could get out of this assignment," or "What questions do you have?")

Check-ins reduce anxiety and micro-managing: A lot of leaders are reluctant to delegate because they're afraid they won't have all the answers when they get the pop quiz from their boss about what's going on with a project. Most of the leaders I work with are finding that being clear up front with the person they're delegating to about the depth and frequency of the check-in process alleviates the urge to micro-manage and the anxiety behind it. It also makes it much less likely that they're going to drive their team members crazy.

Scott Eblin is an executive coach, speaker, and author of two books: *The Next Level: What Insiders Know About Executive Success and Overworked and Overwhelmed: The Mindfulness Alternative*. He's a graduate of Harvard, teaches leadership coaching at Georgetown University, and is a registered yoga teacher. He lives in Los Angeles and can be contacted via www.eblingroup.com. This article was reprinted from the Eblin Group website.



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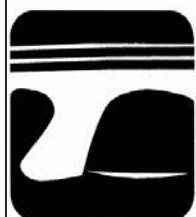
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Stampede, The Supercomputer

By Aaron Dubrow

Sometimes, the laboratory just won't cut it. After all, you can't recreate an exploding star, manipulate quarks or forecast the climate in the lab. In cases like these, scientists rely on supercomputing simulations to capture the physical reality of these phenomena--minus the extraordinary cost, dangerous temperatures or millennium-long wait times. When faced with an unsolvable problem, researchers at universities and labs across the United States set up virtual models, determine the initial conditions for their simulations--the weather in advance of an impending storm, the configurations of a drug molecule binding to an HIV virus, the dynamics of a distant dying star--and press compute.

And then they wait as the Stampede supercomputer in Austin, Texas, crunches the complex mathematics that underlies the problems they are trying to solve. By harnessing thousands of computer processors, Stampede returns results within minutes, hours, or just a few days (compared to the months and years without the use of supercomputers), helping to answer science's--and society's--toughest questions.

Stampede is one of the most powerful supercomputers in the U.S. for open research. Able to perform nearly 10 trillion operations per second, Stampede is the most capable of the high-performance computing, visualization and data analysis resources within the National Science Foundation's (NSF) Extreme Science and Engineering Discovery Environment (XSEDE). The system is a cornerstone of NSF's investment in an integrated advanced cyberinfrastructure, which allows America's scientists and engineers to access cutting-edge computational resources, data, and expertise to further their research across scientific disciplines.

At any given moment, Stampede is running hundreds of separate applications simultaneously. Approximately 3,400 researchers computed on the system in its first year, working on 1,700 distinct projects. The researchers work spanned a range of scientific disciplines from chemistry to economics to artificial intelligence. Researchers are provided access to Stampede free of charge and tap into an ecosystem of experts, software, storage, visualization, and data analysis resources that make Stampede one of the most productive, comprehensive research environments in the world.

"The model that TACC used, incorporating an experimental component embedded in a state-of-the-art usable system, is a very innovative choice and just right for the NSF

community of researchers who are focused on both today's and tomorrow's scientific discoveries," said Irene Qualters, division director for Advanced Cyberinfrastructure at NSF. "The results that researchers have achieved in Stampede's first year are a testimony to the system design and its appropriateness for the community."

The Intel Xeon Phi [aka the 'many integrated core (MIC) coprocessor'] squeezes 60 or more processors onto a single card. In that respect, it is similar to GPUs (graphics processing units), which have been used for several years to aid parallel processing in high-performance computing systems, as well as to speed up graphics and gaming capabilities in home computers. The advantage of the Xeon Phi is its ability to perform calculations quickly while consuming less energy. As advanced computing systems grow more powerful, they also consume more energy--a situation that can be addressed by simpler, multicore chips. The Xeon Phi and other comparable technologies are believed to be critical to the effort to advance the field and develop future large-scale supercomputers. Though Xeon Phi adoption on Stampede started slowly, it now represents 10-20 percent of the usage of the system. Among the projects that have taken advantage of the Xeon Phi co-processor are efforts to develop new flu vaccines, simulations of the nucleus of the atom relevant to particle physics and a growing amount of weather forecasting.

The power of Stampede reaches beyond its ability to gain insight into our world through computational modeling and simulation. The system's diverse resources can be used to explore research in fields too complex to describe with equations, such as genomics, neuroscience and the humanities. Stampede's extreme scale and unique technologies enable researchers to process massive quantities of data and use modern techniques to analyze measured data to reach previously unachievable conclusions. Leveraging 14 petabytes of high speed internal storage, users can process massive amounts of independent data on multiple processors at once, thus reducing the time needed for the data analysis or computation.

Since it was deployed, Stampede has been in high demand. Ninety percent of the compute time on the system goes to researchers with grants from NSF or other federal agencies; the other 10 percent goes to industry partners and discretionary programs. "The system is utilized all the time--24/7/365," Stanzione said. "We're getting proposals requesting 500 percent of our time."

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With a resource like Stampede in the community's hands, great discoveries await. "Stampede's performance really helped push our simulations to the limit," said Caltech astrophysicist Christian Ott who used the system to study supernovae. "Our research would have been practically impossible without Stampede."

Aleksei Aksimentiev, a professor of physics at the University of Illinois-Urbana Champaign, used the National Science Foundation-supported Stampede supercomputer to explore a cutting-edge method of DNA sequencing. The method uses an electric field to drive a strand of DNA through a small hole, or "nanopore," either in silicon or a biological membrane. By controlling this process precisely and measuring the change in ionic current as the DNA strands move through the pore of the membrane, the sequencer can read each base pair in order. Aksimentiev and his group showed that localized heating can be used to stretch DNA, which significantly increases the accuracy of nanopore DNA sequencing. In addition, he and his team used an all-atom molecular dynamics method to accurately describe DNA origami objects, making it possible to engineer materials for future applications in biosensing, drug delivery, and nano-electronics.

Working with researchers at the National Oceanic and Atmospheric Administration (NOAA), Fuqing Zhang and a team of weather modelers at Penn State University have created an improved method of hurricane forecasting that incorporates high-resolution airborne radar observations from the inner core of the storms. This approach has shown great promise for hurricane systems, but requires significant additional computation. Zhang re-forecast the more than 100 tropical storms that occurred between 2008-2012, applying his new method. He showed that the new system reduces Day-2-to-Day-5 intensity forecast errors by 25 percent compared to the National Hurricane Center's official forecasts. A more accurate prediction system will allow emergency management officials, the private sector, and the general public to make more informed decisions during major storms, minimizing the losses of life and property. The methodology of incorporating airborne Doppler measurements was fully adopted by NOAA's operational hurricane prediction model in 2013. This breakthrough in hurricane prediction recently received the 2014 Banner Miller Award bestowed by the American Meteorological Society.

Cornell University researchers are using the Stampede supercomputer at the Texas Advanced Computing Center to help explain a nanoscale mystery: How can a colloidal gel--a smart material with promise in biomedicine--maintain its stability? Colloidal gels are comprised of microscopic particles suspended in a solvent. They form networks of chained-together particles that support their own weight under gravity. For this reason, the soft solids form an emerging class of smart materials such as injectable

pharmaceuticals and artificial tissue scaffolds. However, they are also beset by stability problems. Researchers conducted the largest and longest simulation of a colloidal gel ever recorded. Their simulations helped answer several questions, including: What are the concentration and structure of the network strands? How does the gel restructure itself over time? And how does its structure affect a gel's mechanical properties?

Aerospace engineers from the University of Illinois, Urbana-Champaign are using the National Science Foundation-supported Stampede supercomputer to explore how jets in general, like those on modern aircraft and inside the human body, generate noise. Jet engines generate intense sound waves that bother people who live near active airports. The noise can be so bothersome that limits are often placed on how loud aircraft can be and how many aircraft can fly over residential communities. Making jet aircraft quieter requires new engine designs; however, no simple explanation of how jets generate noise is available. Daniel Bodony and his colleagues are simulating the turbulent motion generated by air moving from the jet engines and then virtually testing the shape and location of actuators and acoustic liners that can reduce jet noise.

In related research, Bodony is seeking to understand how the voice is created, which also relies on the research around the aeroacoustics of jets. However, this time the unsteady jet of air is created by vocal folds, or vocal chords, when a person speaks. Once speech production is understood, Bodony and his team will use Stampede to determine how to design synthetic vocal chords to restore speech when it is lost due to strokes or other pathologies.

Scientists from the National Renewable Energy Laboratory (NREL) are using the National Science Foundation-supported Stampede supercomputer to improve biofuel production by determining how certain enzymes break down cellulose (plant cell walls). They describe a newly-discovered, naturally-occurring enzyme that could significantly speed up the process by which cellulose is decomposed. The enzyme, called lytic polysaccharide monooxygenase or LPMO, represents an important, unique discovery because of its prevalence in nature, and its potential importance to cost-effective biomass deconstruction. The researchers examined two ways that the fungal enzymes catalyze reactions. The simulations suggest that the binding of copper and oxygen by the enzymes is critical to its function. The group is also designing chemical catalysts for high-temperature deoxygenation chemistry, which is important to convert biomass to fuels.

Aaron Dubrow, NSF can be reached at adubrow@nsf.gov or 703-292-4489.

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PowerPoint, A Learning Tool?

By Gary Trotta

As I sat in a rather long “hold your questions because we have a lot to cover” business meeting counting to myself slide 46, slide 47, oh darn, look at this, slide 48 has a graph and 11 lengthy bullet points, I started to reminisce on my high school days. Okay, I’ll admit to not being the best of all students in high school. It seems then, as now, my mind was prone to wondering a bit. I’m certain that I would have been diagnosed as suffering from Attention Deficit Disorder had I been in school today. But perhaps it’s for the best, because without much help from the early educators, I had to figure out a method of focusing my thoughts so that I might better learn! What I discovered was that within classes I had a natural interest in, I eagerly asked questions. And my questions lead to small discussions and an even higher level of interest on my part, which lead to more questions and in time, voila, better grades! It doesn’t sound revolutionary, but for me it represented a sort of epiphany which I could transfer to less interesting classes. Just ask a simple question. Obviously I became one of the more obnoxious students to attend class with, but I figured it was all for the greater good.

Back in my boring meeting, I risk breaking the presenter’s rule on audience participation and get in a quick question related to slide 48. Unfortunately I’m told ALL questions will be covered in depth at the end of the program. The presenter again reiterates his mission: “Not rain, sleet, nor will a ‘bored out of their minds’ audience keep me from reaching slide number 92!” I may have never gotten out of high school with the ubiquitous presence of PowerPoint today. It’s hard to get in a decent question amongst the torrential flow of information embedded in the multitude of cryptic bullet points all pounded out by some monotonally sadist. That’s right, it’s that demon PowerPoint residing on over 250 million computer systems today, and according to Microsoft, responsible for over 30 million dynamic presentations daily. And it all started in 1984 when Bob Gaskin, a Berkeley Ph.D., went to work for a small Silicon Valley firm called Forethought. Bob hired a software developer, Dennis Austin, and together they developed an amazingly powerful and poignant software application named, yes, you guessed it – ‘Presenter’ (which was later change to PowerPoint due to a legal dispute over the name). Then Forethought accepted a 14 million dollar acquisition offer from Microsoft, and in 1990 the first PowerPoint for Windows was launched, regrettably destined to become the monster piece of software it is today.

Why “regrettably” you might well ask. Well, it’s due to the fact that PowerPoint, as it is

used today, perpetuates a very traditional, well-entrenched and extremely poor model for learning - an endless decree of information dumped into classrooms and meetings in which content is king, lording over innocent listeners in fear of interrupting the next enigmatic bullet point. We’ve all experienced this event. The presenter comes to the front of the room; the projector is turned on, as a gasp is heard throughout the audience. “He’s got 75 slides to get through!” The lights dim, the intro slide appears, and 20 minutes later a sea of drooping eyes and sagging heads struggle to comprehend the explanation for an endless stream of bullet points. IT IS EXHAUSTING!

But perhaps I’m being a bit hasty, blaming, after all a software application, for what is most likely a more human predicament. We’ve set the standard. Let’s face it, showing up at a presentation without a PowerPoint ready to go in all its colorfully animated glory is like entering the room wearing nothing more than your birthday suit. It’s just not done! How else are we supposed to judge this presenter if not upon their witty presentation quotes, clever transitional slides, and “funny but poignant” cartoons?

And although there are many different presenters, styles, many fall into one of only two categories: the “Shine that light a little brighter, I’m on” speaker, and the “Boy I didn’t know a human being could perspire that much” presenter. Our “bright light” loves to hear the sound of his or her own voice. They’re constantly astounded by the amount of information they know, and even more amazed that it is possible to deliver it all in only 90 detailed slides packed into one tiny little hour. These folks won’t hesitate to tell you, “I may have to move a bit faster here, so hold your questions until you’ve passed away and then send me a message from beyond the grave. I’ll get back to you as soon as you’re reincarnated as a Japanese beetle.” And while pearls of wisdom pour from this presenter’s lips, indeed a downpour of perspiration drenches our next speaker type. If it were not for the sweet control afforded to this speaker by the knowledge that they and only they know what’s on the next slide, they would anxiously melt like the Wicked Witch of the West into a puddle behind their podium. In effect these are speaker junkies, spared cold sweats, nausea, dry mouth and palpitating hearts by that PowerPoint monkey and his henchman the remote mouse. The regrettable point regarding both speaker types is that we, who are here to learn, never have the opportunity to actively participate in the learning process. The net result is of course, we simply don’t learn much.

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Let me relinquish my “not so clever” sense of humor for a moment to introduce a bit of science. We’ll turn to some real experts on just what is needed for us to learn. Did you know that our short term memories only have the ability to retain information for about 10 to 15 seconds? It kind of acts like a buffer zone, and must make room for new information by passing the old new information onto our long term memories, or just dropping it altogether. But studies show it’s not so easy to get information into our long term memories, and typically facts must be revisited and reinforced, before synapses are strengthened and thus retained. Now think of a PowerPoint presentation and its fast and endless information flow. There is literally little time to engage, challenge, analyze, question, converse, and more importantly LEARN!

According to Judith E. Fisher, PhD, in her article entitled Active vs. Passive Learning, within a traditional classroom lecture “The listener’s attention does not remain constant. In fact, after just 10 - 20 minutes of trying to pay attention, the average listener’s attention slips and waivers. Even the most compelling presenters and the most dynamic content information will not be able to sustain attention from average listeners for longer periods of time.” In fact it has been shown that although it may be administratively convenient for listeners to be seated in meeting and classroom settings, such sedentary postures do little to help us learn. When our brains become active and alert they require a higher level of oxygen and adrenalin. However, when seated, oxygen and adrenalin levels decline. In addition, if adrenalin levels fall too low our ability to learn will simply stop. Dr. Fisher goes on to state in her article “Active Learning implies that students engage in some kind of learning activity that forces them to remain mentally alert as they manipulate the content information in a variety of ways. They won’t be simply hearing what you present; they’ll be analyzing, restating, interpreting, reflecting, considering and applying the information.”

Richard Hake, ‘Measuring Teaching and Learning Performance: Interconnected Issues’ further explains, “The fact that Interactive Engagement (IE) methods are far more effective in promoting conceptual understanding than traditional passive-student methods is probably related to the ‘enhanced synapse addition and modification’ induced by those methods.” This idea is further reinforced by Leamson (Teaching and Pedagogy - 1999) who writes “Teaching must involve telling, but learning will only start when something persuades students to engage their minds and do what it takes to learn.”

With all this said then, is Edward Tufte ‘spot on’ in writing his article “PowerPoint is Evil.” Tufte goes on to infer that PowerPoint induces stupidity, turns everyone into bores, wastes time, and degrades the quality and credibility of communications. Yet with all this stinging criticism of the Number 2 software in the world, who comes to our

rescue, moving faster than a speeding bullet point, infusing learning into our otherwise boring presentations in a single bound, saving sleepy audiences from a multitude of uninformed informers and fights for truth, justice, and a better way to learn? It is none other than our hero, that application behind the mask, and I’ll bet you never guessed it, Microsoft PowerPoint. Hold on, did I say PowerPoint?

Indeed just like John Travolta in Pulp Fiction, or Johnny Depp in Pirates of the Caribbean this bad guy may still do good! Indeed PowerPoint has been the victim of a bad rap. It is really the way we choose, or better yet, choose not to use this very dynamic application. In effect teachers and trainers have chosen, for whatever reason, to use PowerPoint as an instructor-centered versus learner-centered tool. If real learning requires learner engagement, participation and interaction with the material to be learned, PowerPoint is just right for the job. Consider just a few ideas for using PowerPoint to engage your audience. You begin your program presentation with an interactive icebreaker built in PowerPoint. Perhaps it is a word search game highlighting key words within the upcoming program, or a ‘Family Feud’ slide, in which your class is charged with coming up with the top 10 qualities found in great leaders or in providing outstanding customer service. You decide to turn you entire presentation into an interactive game by periodically introducing stimulating program questions and scoring teams as you move through your presentation. You cleverly insert flow charts, graphs and mind maps into your presentation and challenge members of your audience to step up and attempt to present these back to the group. Towards the end of your program you decide to insert one of a myriad of great quiz show games built in PowerPoint to review materials you’ve just presented. Your effort is to creatively turn a boring data dump into an enjoyable, even fun and interactive presentation, using our new best friend MS PowerPoint. You find your learners are more relaxed, better able to learn, and in the end, have really retained a lot of the information you were always trying to convey.

Gary Trotta is the founder and CEO of Training Games Inc. (www.training-games.com). Training Games Inc. develops games for speakers, teachers and trainers in MS PowerPoint and MS Excel including the TGI Presentation Game which “Turns Your Presentation into a Training Game.” Gary has a Master’s Degree in Human Resources and Organization Development from the University of San Francisco and a B.A. in Psychology from SUNY Geneseo. He has over 26 years of experience in corporate training and various corporate management positions. He considers himself a “trainer” above all else. Contact Gary Trotta at gary@training-games.com. This article originally appeared at www.articlecity.com/articles/education/article_2516.shtml.



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The Engineering Society of Buffalo contemplates publishing biographical sketches of members in the monthly newsletter "The Western New York Engineer". For this purpose we would like the following information:

Date of Birth: _____ Married Y N

Member of what other clubs/societies: _____

Education: _____

In what engineering field(s) are you interested in? _____

Resume attached? Yes No

Sports & Hobbies: _____

Name of Spouse and Children: _____

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Children: _____

Name as it should appear on ESB Membership Card: _____

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- Activities in which you would like to participate
- Advertising
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 - Bowling League
 - Newsletter/Roster
 - Golf Outing
 - Education
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 - Scholarship Run
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 9:00 am Registration & Open Practice Range
 10:00 am Shotgun Start

Where: Chestnut Hills Country Club
 1330 Broadway Darien, NY

Fee Includes: 18 Holes of Golf with cart, Bucket of Balls on Driving Range,
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Questions: Email Jeff Wach at jwach@egwpersonnel.com



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 The Engineering Society of Buffalo
 C/O Jeff Wach
 1700 Clinton St
 Buffalo, NY 14206
 716-826-4233

Please register me for:

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