VIRGINIA TECH
GRADO
DEPARTMENT OF
INDUSTRIAL AND
SYSTEMS
ENGINEERING

THE ISE CONNECTION

YOUR WAY TO STAY IN THE KNOW AS ISE GROWS

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FEBRUARY 2014

INSIDE THIS ISSUE:

IMPORTANT: To receive this letter in the future, please contact **Joyce Vest** at **[vestjs@vt.edu]** so that we may add you to the newsletter listserv.

Giving a Helping Hand to our Friends Next Door

Many students know the Next Door Bake Shop as a cozy corner with the perfect recipe for studying ambiance: a musical playlist from heaven and fantastic food and coffee. What many students do not know is that the Next Door Bake Shop is expanding at an unprecedented rate. With the booming business, inventory control concerns began to arise. At the beginning of the fall semester, ISE students partnered with the Next Door Bake Shop to analyze the current inventory and ordering systems and look for a more efficient strategy. The ISE team included Katie Bolander, John Redlinger, and John Fenninger.

One of the first priorities for the team was tracking current purchases and inventory levels in order to identify trends. By tracking this information, the ISE team discovered the need to focus their efforts on minimizing the number of trips made to the grocery store, as well as maximizing the bulk food deliveries made by truck. The main goal of the project soon became decreasing the number of trips to the store, which was about eight or nine times per week. In addition to the added cost of gas, these store trips also took the manager's time away from the shop. After compiling the information, the team presented a plan to the manager to allow for a reduction in store trips.

Using information from their classroom studies, the team also performed a cost analysis of purchasing items in-store versus having items delivered by the truck. Many items were found to be much cheaper when purchased in bulk from the truck rather than individually at the store. Though this information was discovered, some items could not be switched due to inventory holding constraints; space was limited due to the size of the establishment.

Overall, the team utilized important concepts from the classroom and gained experience within ISE, all while helping a local business within the community.

Written by Katie Bolander, Project Head

Congratulations Winter Alpha Pi Mu Initiates!

First row, from left to right: Brittany Rodgers, Baekkyung Shin, Julianne Dutzer, Emily Basso, JohnSoon Park

Second row, from left to right: Eric Tabarly, Curtis Calder, Ari Goldberg, Quabena Adu-Gyamfi, Savannah Bailey

Congrats to APM as a whole for yet again winning the Best National Chapter Award!

Trick or Treat with Faculty!

Students and professors participated in Halloween fun.

Top Left: Dr. Eileen Van Aken, Meredith Johnson, Em Basso, Dot Cupp, Teresa Coalson

Top Right: Dr. Michael Agnew, Katie Bolander

Bottom Left: Dr. Joseph Gabbard

Advisory Board Q&A

On Thursday, October 24, 2013, members of the ISE department's advisory board shared their insight and stories on topics including leadership fundamentals, critical factors to consider when choosing a job, and advice for new employees or interns. Some of the advice was lighthearted, like one member urging students to work for Swedes because they take two week vacations. Other advice on the subject of success and leadership resonated a little deeper.

According to members of the advisory board, it is crucial that a successful engineer have insatiable curiosity. After taking a job, a new employee should use the carte blanche of newness to ask current employees to lunch and learn as much as possible. In doing this, one can learn about the company, build a network, seek new knowledge, and have the information necessary to challenge the status quo. Even in the most grueling assignments, panel members stressed the importance of identifying what you are learning. Once you cease to learn from a job, that's when it's time to look for employment elsewhere.

On the subject of leadership, advisory board panel members stated that an effective organization has open lines of communication both upwards and downwards. An effective leader knows how to quickly build trust and authenticity, and the way to do that is to keep the best interest of clients in mind and to know the motivators for clients. That way, you can create both a solution and messaging geared toward those motivators. An excellent leader steps up to make sure that all opinions are being considered, and tries to make all parties feel that they are winning something.

As an entry-level employee, leadership will not simply be handed down. In order to stand out, you must treat your work like it is the $50 million project that senior employees are working on. Instead of identifying problems and asking how you can help, try coming up with an idea for a change. ISE's are talented problem solvers, and the way to earn your boss's attention is to identify a problem, generate a solution, and offer to solve the problem.

On behalf of the students who attended this year's Q&A, thank you to the panel members for sharing your wisdom.

Written by junior Sarah Oertel, Advisory Board and Alumni Relations Committee Head

Focus Groups Provide Feedback for Department

Last semester in early November, the ISE department held focus groups. The purpose of these events was to get feedback from students on various topics including ISE curriculum, electives, and out of the classroom opportunities. The focus groups offered a chance for sophomores, juniors, and seniors to let their voices be heard and help improve the department by interacting with 10-15 other ISE students with no faculty or staff present. These events were facilitated by the ISE Ambassadors who also moderated and recorded student feedback. All remarks remain anonymous and are combined to find common themes and improvement opportunities.

This year, the department held four separate sessions. This allowed for a session of just sophomores and another with seniors only, as well as two sessions with all academic years. The sophomore session generated feedback on the new Intro to ISE course, curriculum for the 2016 check sheet, ease of transferring into ISE, and how they found out about ISE. The seniors-only session allowed for feedback tailored to after-graduation opportunities and skills learned throughout ISE UG curriculum as compared to anticipated skills. The department uses these focus groups to grow and improve the department every year.

Written by senior Matthew Shutt, Curriculum Committee Head

Featured Article

ISE Alumni Making a Difference at Technomics

Did you know?!

Virginia Tech's Undergraduate ISE Program was —named 8th in the nation!

When Technomics, Inc. hired its first VT ISE graduate, Kenneth Rhodes (BS ISE '07), in May of 2007, the consulting firm had approximately 30 employees. Since then the company has grown to over 70 employees including ten VT ISE graduates, the latest additions being Eric Cohen (BS ISE '12) and Betsy Nash (BS ISE '12).

Technomics is an Arlington-based consulting firm that specializes in providing cost analysis services and products to a variety of clients, including but not limited to the Department of Defense, Department of Homeland Security, Department of Energy, and the Government Accountability Office. Cost analysis is a component of systems engineering that entails research, development, and application of quantitative techniques to estimate the development, production, and operations and support costs (i.e. life-cycle costs) of systems such as ships, aircraft, and satellites. Cost analysis is integral to the successful planning and execution of not only complex defense projects, but also non-defense projects such as Department of Energy environmental clean-up projects. Cost analysts assist decision makers in establishing realistic budgets and optimizing the allocation of resources across competing projects.

The company has continued to hire ISE graduates, in part due to their strong background in mathematics, statistics, computer programming, and economics. Technomics CEO Rick Collins' opinion is that many of the best cost analysts in the field are ISEs. ISEs offer a diverse background for a variety of projects. Colleen Craig (BS ISE '08) has worked on data management and analysis in support of work with the Air Force Cost Analysis Agency, while Randall Lantz (BS ISE '06) is developing cost estimating databases for Department of Energy. There are also opportunities to apply direct project management and weapons systems cost estimation skills, for example the work that Bob Nehring (MS ISE '09) and Laurie Calzadilla (BS ISE '08) perform in support of critical Navy and Coast Guard programs such as Littoral Combat Ship, Coast Guard Cutter, and Surface Electronic Warfare Improvement Program.

The skills and tools learned in the ISE curriculum at VT have also contributed to growth into new business areas for the company. Travis Manning (BS ISE '07, MS ISE '08) and James Glenn (MS ISE '05) led a discrete-event simulation project for the Office of the Secretary of Defense to assess the system yield of the nation's satellite launch vehicles. Additionally, Travis Manning and Brian Torgersen (BS ISE '07), former senior design teammates, have started to provide program management and systems engineering support to the Navy's Surface Electronic Warfare Improvement Program.

Technomics has recently become more involved with the ISE department. For the past six years, CEO Rick Collins (MS Economics '92) has guest lectured to the senior design class on the field of cost analysis and its role in project management. Last year the company sponsored its first senior design project, titled "Database GUI Enhancement." The senior design team designed and developed a database tool to help improve company data collection and storage processes at the company.

The impact an Industrial and Systems Engineer can make given their breadth of skills is endless, and can be seen firsthand at Technomics. Whether estimating with non-linear regression, organizing a team of people, or presenting a product, ISEs have the opportunity and skills to excel at Technomics.

Below, several Technomics VT alumni pose for a group photo.

About Technomics, Inc.: Technomics is an employee-owned consulting company with a strong foundation in weapons systems cost estimating and research. The company has grown consistently over the past decade and has offices in Virginia and California. Visit www.technomics.net for more information.

Ways to Stay Connected

If you and members of your class or your employer would like to sponsor or be a co-sponsor of an event (e.g., ISEats, pizza for information sessions, Relay for Life fundraising events) contact us and we will help you coordinate your efforts! Also check out our new student website, www.vtise.org!

Comments or suggestions? Contact Chief Editor Sarah Oertel at soertel1@vt.edu

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Third Annual International Night

The Industrial and Systems Engineering department held its third annual International Night on November 6th, 2013. About forty people, including a mixture of students, faculty, and staff, shared a meal along with some international food provided by the presenters, including Dr. Agnew's Canadian maple cookies and French chocolate treats made by Sarah Oertel. Eight presentations were given by students between the sophomore and graduate student levels along with a presentation given by Dr. Agnew. The presentations covered countries ranging from Australia, to South Korea, to Peru, to Italy. Each presentation consisted of a little history on the country's development, the country's capital and flag, common cultural celebrations, traditional food, and additional fun facts. Students that gave presentations were either internationally born themselves or had previously completed study abroad programs. Celebrations like International Night are good reminders that while we are all ISE students, our backgrounds and heritages truly make us unique, and our experiences serve to set us apart.

Written by junior Jenna Reed, Social Committee Head

ISE Community Involvement with Micah's Backpack

This fall, the ISE community involvement program partnered with Micah's Backpack to work on a new project. Micah's Backpack is a local organization that provides food to children who qualify for free lunches at their local public schools by packing backpacks filled with food for the weekends. A large number of volunteers come together every Thursday evening to follow an assembly line process for packing the food.

Volunteers travel from station to station, putting food items into backpacks until they reach the final station where they leave the bags. Afterwards, they get back in line and repeat the entire process. When the desired number has been reached, all the backpacks are moved to a vehicle and shipped to local schools for distribution.

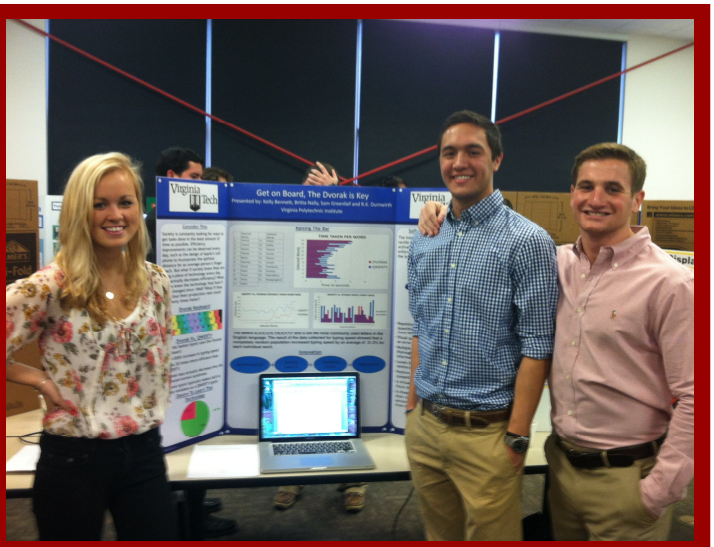
One of the major issues faced by Micah's Backpack was not having the adequate amount of time and staffing level to train and instruct new volunteers. Five ISE students worked together to create a visual aid to improve the volunteer training process for Micah's Backpack. Using knowledge obtained from courses like Human Factors Engineering, the team designed a visual display of the assembly line layout to minimize confusion. Also, new volunteers became more knowledgeable of the overall process which ultimately decreased work time. With the help from ISE students, Micah's Backpack improved its volunteer training process while these students were able to gain real world experience by volunteering for a local organization.

Written by Albert Luu, Project Head

Junior Class Human Factors Design Symposium

Juniors taking the course Introduction to Human Factors during the Fall 2013 semester were assigned a unique and challenging final project. It not only tested their knowledge of the subject, but forced them to think creatively and gave them a taste of what was to come for their senior year capstone project. These students were tasked to choose something in their everyday life and improve it using their newly acquired skills in Human Factors best practices.

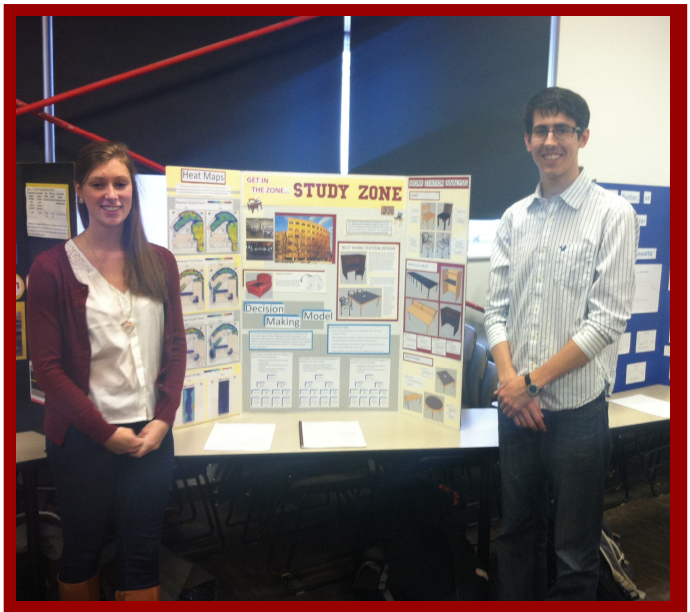
Given limited time and resources, it would have been impossible to actually implement a solution regarding their improvement; therefore, they needed only to define the problem and gather data in order to back up their claimed human factors inadequacies. They then needed to create a poster or visual resource displaying their research method and design and show it at a symposium consisting of the entire class and their projects as well as some ISE faculty. This symposium modeled what the students would be faced with for their senior project on a small scale in order to give them some practice .



From left to right: Kelly Bennett, Sam Greenlief, and R.K. Durnwirth. Not pictured: Britta Nally.

Students got very creative with the projects, which ranged from the evaluation of the safety of crosswalks on Virginia Tech's campus to the noise level on the sidelines of Lane Stadium during a game. Some students evaluated buildings and classrooms in terms of their noise and light levels, desk and chair dimensions and arrangement of the space, and then proposed a redesign of these factors to fit the purpose of the room. There were also several groups that decided to redesign websites or apps in order to increase the intuitiveness of navigating the pages and improve the ease of use.

Many tools were used in the evaluation of these problems including survey research, photometers, sound level meters, measurement tools, and course materials. The symposium ended up being a fun time for all, and students received a lot of very positive feedback from classmates, faculty, and Dr. Agnew, professor of the course. Overall, the final project for Introduction to Human Factors tested and expanded students' skills regarding human factors, allowed them to think outside of the box, and prepared them for the ever-important senior capstone project to come.



From left to right: Project winners Clara Bigelow, Paul Bartholomew. Not pictured: Shae O'Hara and Kevin Lukhard

Written by Junior Em Basso, Community Involvement

Share Your Experience!

The new ISE website has a tab for current and previous students to share their internship or co-op experiences with the rest of the department. Reviews of over 25 companies already exist, but we need your experience to help make this resource even better. The review process takes about 15 minutes and will provide all ISE students a view into what your internship experience at a company was actually like.

Visit the website today to add a review and **c**heck out previous submissions at: **http://vtise.org/careers/reviews** !

Creating a Culture of Giving

At the Grado Department of Industrial and Systems Engineering, our vision is to be leaders in research, education, and professional outreach as well as in our communities and society. Funds from the Commonwealth of Virginia do not cover our annual budget or needs, and private giving is critical if we are to maintain, let alone improve, the high quality of our processes. Giving to ISE at Virginia Tech can provide student scholarships, maximize students' learning, help us attract and retain the world's best faculty, assist with day-to-day operations, and help maintain state-of-the-art research and teaching facilities. If we are to be competitive with other top-10 departments, giving is vital.

To aid us in soliciting funds for this endowment, we recently commissioned a

sculpture, which has been installed on the wall in Durham Hall right outside the departmental office suite. The names of our Benefactors will appear prominently on the large brass plaques above the sculpture and the names of our Patrons will appear on the brass plaques on either side of the sculpture. Our Sponsors' names will appear on the bronze plaques surrounding the sculpture.

For more information on donating to the Hokie Bird fund, visit

http://www.ise.vt.edu/support/vitalgiving.php

A Special Thanks And Recognition To Our Excellence Fund Contributors

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