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WATERLOO ENGINEERING

INSIDE THIS ISSUE

50th ANNIVERSARY

Bill Lennox will share his memories when the inaugural class of Waterloo Engineering celebrates its 50th anniversary September 28-

October 1, 2012. The former dean of the Faculty of Engineering was one of the first students to graduate in 1962. [See page 3]



**WATERLOO
ENGINEERING**

engineering.uwaterloo.ca/alumni





FROM THE DEAN

I am extremely honoured to be serving as the eighth dean of this extraordinary Faculty and to be writing my first WEAL column. Eight years ago, I joined the University of Waterloo as an engineering faculty member and served as chair of the mechanical and mechatronics engineering department from 2006 to 2011. What attracted me to the university was its energy, atmosphere and vitality and I'm still constantly fascinated by the incredible impact being made by our students, faculty members and alumni.

It was a privilege to have worked with my predecessor and mentor Adel Sedra, who retired as dean of engineering on June 30. He had a clear vision of what needed to be done to make the Faculty one of North America's premier schools of engineering. By spearheading two visionary academic plans – Vision 2010 and Vision 2015 – he did that and much more.

As dean for the next five years, I see my primary responsibility to be preparing the Faculty for a dynamic and increasingly complex world. It's essential that Waterloo Engineering successfully develop “the engineer of the future”, one who will have the depth and breadth of engineering knowledge and skills to adapt and succeed, even in the most challenging conditions. To do this, the Faculty will provide students with opportunities to venture outside their own disciplines, test new ideas and be exposed to a continuum of experiential learning environments on and off campus. The \$8.5-million undergraduate laboratory equipment renewal project, part of Vision 2015, will facilitate change in the content and delivery of programs.

I would like to see outside classroom activities become interactive, focusing on deeper learning and critical thinking through hands-on practicum/projects and open-ended problems that encourage students to locate, evaluate and integrate information to bring the theoretical and practical pieces together. The new “learning space” must be one that encourages communication, collaboration, questioning, perseverance and making informed judgments.

Pursuing new understandings and technology through research and creative work at the highest international level of excellence is central to the Faculty being recognized as a research intensive engineering and architecture school. In an increasing climate of competition, we need to elevate the visibility of our exciting leading-edge research and facilities to recruit top scholars from across Canada and around the world.

Through Vision 2015, initiatives will be developed to foster entrepreneurial activity among Waterloo Engineering's students and faculty members. Teaching and mentorship resources in the Conrad Business, Entrepreneurship and Technology Centre will be leveraged to create a culture that enables students to implement their ideas and start-up projects.

September 2012 is an exciting month for Waterloo Engineering. Not only do we have a new cohort of students starting classes, but the doors will officially open to the new state-of-the-art Mike and Ophelia Lazaridis Quantum-Nano Centre on September 21. The building houses our unique undergraduate and graduate nanotechnology programs, and university research facilities to support two institutes – the Waterloo Institute for Nanotechnology and the Institute for Quantum Computing.

At the end of the month, we'll celebrate the golden anniversary of our very first engineering graduates. The 50-year reunion of the Class of 1962 is taking place September 28 to 30 at the same time as the reunions of many of our other engineering classes. I look forward to attending my first reunion weekend as dean and personally greeting you there or at the many other upcoming events we have planned.

Sincerely,

Pearl Sullivan

Dean, Faculty of Engineering





Bruce Hutchison at his 1962 Waterloo Engineering graduation.

FIRST CLASS MEMORIES

Not long after he graduated in 1962 with an electrical engineering degree, Bruce Hutchinson booked an appointment with his dentist in Saskatoon. Noticing the iron ring on his finger, the dentist asked him where he'd gone to school.

Hutchinson told him he was part of the inaugural class of University of Waterloo engineering students. Impressive? Absolutely. But the dentist knew the City of Waterloo for a reason other than its young, upstart university.

"Oh yeah, students wrote the word 'BEER' on the water tower there!" the man answered, referring to the high jinks that made national news.

What a difference five decades has made. Now when Hutchinson tells people he has an engineering degree from Waterloo, he can see they're simply impressed by the university's reputation.

"Just recently I was talking to a doctor and when I told him I went to Waterloo you could really see him perk up. He was thinking, 'Wow,'" says Hutchinson.

"The reunion gives us all a chance to tell stories...and lies. It will be a great time."

It's this kind of story that will likely be shared by the engineering graduates at their 50-year anniversary reunion being held at the end of this month from September 28 to 30. At the milestone reunion, alumni will have the opportunity to attend a special lecture, visit the new Student Design Centre, and pull up a chair at reunion dinners, lunch buffets and brunches.

Ron Gotts, the class representative for chemical engineering, is looking forward to the iron ring obligation renewal ceremony that will kick off the weekend. An engraved iron ring, specifically created for the first class of engineers, represents much to the pioneering students who took a chance on a new school that was more idea than bricks and mortar.

"Being in the first class, it really forced you to try hard. You were pretty much on your own and had to find a way to get your work done," says Gotts.

Waterloo and its innovative co-op program was instrumental in launching both Gotts' and Hutchinson's careers. Gotts eventually went on to work in the environmental field while Hutchinson, this year's class rep for electrical engineering, taught computer electronics at a college in Hamilton. Bill Lennox, both the former chair of civil engineering and dean of Waterloo Engineering, is also a rep for the reunion.

"One of the things we tend to forget is that when we started in 1957 the terms were only three months, instead of four," remembers Lennox. "So you were always on the move."

Since the failure rates were high during the engineering program's first few years the university would provide the students with loans allowing them to skip work terms and immediately join the next upper-year class.

"Another feature in the beginning was that you could be admitted to a pre-engineering year after just four years of high school. All other universities at that time required five years of high school," says Lennox.

Because there were only 74 initial engineering students, the group of alumni attending the reunion is expected to be small, but that won't stop Gotts from catching up with his former classmates who do come.

"The reunion gives us all a chance to tell stories . . . and lies," he jokes. "It will be a great time."

FACULTY NEWS

WE'RE NUMBER ONE!

SURVEY RANKS WATERLOO TOP ENGINEERING SCHOOL IN CANADA

According to a recent survey conducted by Business Insider, a respected U.S.-based online news source, Waterloo Engineering is the best engineering school in Canada.

The same survey placed Waterloo 29th in the world, with two other Canadian universities included in the top 50. The University of Toronto ranked 35th and the University of Ottawa took the 44th spot.

Industry and business leaders participated in the survey, and 91 per cent of the respondents reported having a computer science, engineering or equivalent degree. Among these respondents, the majority cited the most important criteria considered when selecting an engineering school were the skills and knowledge acquired, and the brand value of the school.

"I'm delighted that we've been recognized as the number one engineering school in Canada," says Waterloo Engineering Dean Pearl Sullivan. "The ranking speaks volumes about the high quality of our students and alumni. Our exceptional faculty members continue to make a significant global impact through education and technological innovations in Canada and around the world."

Last month, Waterloo Engineering was ranked number 43 in the world (number two in Canada) in the "Engineering/Technology and Computer Sciences" Field of the Academic Ranking of World Universities for 2012. Along with the University of Toronto in 13th spot, we are the only two Canadian schools in the top 50 of what's also known as the Shanghai Ranking.

ENGINEERING DEGREES AWARDED, FACULTY AND STUDENTS HONOURED

Our alumni list grew on June 16 with the convocation of 1,359 students in two ceremonies.

Engineering students took the university's two top Governor General's medals. Matthew Daly of mechanical and mechatronics engineering received the gold medal for highest standing in a master's program and Rongxing Lu of electrical and computer engineering was the winner of the gold medal for highest standing in a doctoral program. Mohit Verma of nanotechnology engineering, with a management sciences option, received the Governor General's silver medal. Isaac Victor Roes, a chemical engineering student, received the Alumni Gold Medal.

Garry Rempel, a chemical engineering professor, was the recipient of the award of excellence in graduate supervision. Arash Shahi of civil engineering received the Amit and Meena Chakma Award for Exceptional Teaching by a Graduate Student.

Two champions of Waterloo Engineering, Réal "Ray" Tanguay and William M. Tatham, received honorary Doctor of Engineering degrees. Tanguay, the first Canadian to be named as a managing officer of Toyota Motor Corporation in Japan in 2005, has been a strong supporter of the University of Waterloo for many years. He introduced Waterloo's co-operative education program to Toyota and helped to establish the NSERC/Toyota/Maplesoft industrial research chair in mathematics-based modelling and design.

In 1990, Tatham, a graduate of Waterloo's systems design engineering program, founded Janna Systems, which became a world leader in providing software for financial services. He is currently CEO of NexJ Systems. Tatham made a significant contribution towards the building of the William M. Tatham Centre for Co-operative Education that was named in his honour.



*Over 1,350 new Waterloo Engineers
convocated in two ceremonies on June 16.*



Adel Sedra shares a laugh at his retirement dinner with University of Waterloo President Feridun Hamdullahpur.

STUBLEY HONOURED WITH PROVINCIAL EXCELLENCE IN TEACHING AWARD

Waterloo Engineering's first associate dean, teaching, was one of eight professors province-wide to receive a 2012 Ontario Undergraduate Student Alliance Award for Excellence in Teaching. Gordon Stubley, a mechanical and mechatronics engineering professor, was presented with the award in early April. He was nominated for it by the University of Waterloo's Federation of Students.

"It was both an honour and humbling to receive this particular recognition because, in part, it is very much in recognition of the accomplishments and initiatives of many in mechanical and mechatronics engineering and throughout the Faculty," says Stubley. "I am fortunate to be part of such a wonderful group."

CONRAD CENTRE RECEIVES \$1.6M TO BOOST ENTREPRENEURIAL VENTURES

The Conrad Business, Entrepreneurship and Technology Centre received a U.S. \$1.6 million grant that will help students turn entrepreneurial ideas into business ventures. The Graduate Management Admission Council® (GMAC®), owner of the GMAT® exam and the leading membership organization of graduate business and management schools worldwide, announced the award in April 2012. Waterloo was the only Canadian university to be recognized in the round of funding.

The funding will support the implementation of a virtual incubation program at the Conrad Centre. It will establish a global, online network of students, community groups, local entrepreneurs and international university partners, and is designed to support the development and launch of new businesses.

"Success, for most entrepreneurial students, hinges on having easy access to essential resources, learning opportunities and networks for collaboration and funding, to build their business," says Rod McNaughton, director of the Conrad Centre at Waterloo. "With this funding, the GMAC MET Fund has given us the ability to further support and produce successful new ventures on campus, in the community, and eventually take it global through academic partnerships."

CELEBRATING AN OUTSTANDING CAREER

Teacher. Builder. Visionary. Mentor. Friend. Those were just a few of the words used to describe Adel Sedra at his retirement dinner held in Waterloo at the end of May. After nine years as dean of Waterloo Engineering, Sedra retired on June 30. The event was emceed by Michael Higgins, the former president and vice-chancellor of St. Jerome's University and a close friend of Sedra's, and featured speakers who spoke about Sedra's many remarkable accomplishments.

On June 21, students, faculty and staff members gathered in the Faculty's Student Design Centre to honour Sedra. Among the speakers was Dave Walsh of engineering computing. Walsh, who was a member of the dean's nominating committee in 2002, recalled first meeting Sedra during the nomination process. "When asked why he wanted the job, Sedra told us that he wanted to make a difference in the engineering profession before he retired and he would like to do it here – and boy did he ever," said Walsh. "After hearing him speak I knew we found our new dean."

Although Sedra has retired as dean, he hasn't left campus. He has an office in Engineering 5 and hopes to do some occasional consulting and teaching. As well, he will be writing the seventh edition of his popular *Microelectronic Circuits* electrical engineering textbook.



In June, Patrick Fitzgerald, right, was the fourth member of his family to become a Waterloo Engineer. He followed the educational footsteps of his father Terrence, left, his brother Jordan, centre, and his uncle Brian.

ENGINEERING'S FAMILY TIES

Although Patrick Fitzgerald denies it, there must be something in the water at the Fitzgerald family farm near Peterborough, ON. How else do you explain the fact that Patrick is the fourth in his family to become a Waterloo mechanical engineer? Before graduating in June 2012, his brother Jordan graduated in 2009, their father Terrence in 1981 and their uncle Brian in 1979.

"In our family, it just seems like the thing to do," says Patrick, who is now working at General Electric's large industrial electric motors plant in Peterborough.

Looking out at the audience during his iron ring ceremony earlier in 2012 and seeing his father and brother made him realize how much he had accomplished at Waterloo — and where his career might go.

"Because my dad is an engineer, when I saw him there it was like I was joining him at the engineer's table," says Patrick.

"My wife Christine and I never pushed our sons into engineering. They decided on their own. But when it came down to choosing a university I told them what I knew about Waterloo Engineering already: the co-op program is super."

Terrence, who is a project engineer at Gerdau Long Steel in Whitby, ON, says visiting the campus brought back a lot of memories of his own time at the school. It also showed him that while the university has changed, much of Waterloo's initial appeal remains.

"My wife Christine and I never pushed our sons into engineering. They decided on their own. But when it came down to choosing a university I told them what I knew about Waterloo Engineering already: the co-op program is super," he says.

Patrick agrees with his father. In fact, it was Waterloo's co-op work terms that actually sold him on coming here, even though his brother was already at the school.

"Co-op is more than just about getting experience in the workplace. It helps you decide if what you're studying is right for you. You can really hone in on what you want to do even before you leave school," he says.

Brian, who is a director of engineering and maintenance at a plastics' recycling company in Sarnia, ON, says he's happy he paved the way for all the others after him. He even convinced Terrence to transfer to Waterloo from another university because he didn't think his brother was being challenged enough!

No matter what path they took, however, Waterloo's mechanical engineering program seems to have been a good fit. Patrick made the Dean's Honour List and his brother is now on track to become a nuclear operator.

"I believe this is DNA-driven," says Brian. "I have innate problem-solving skills and I'm not afraid to make a decision. Terry has the exact same perspective. Our parents never drummed it into our heads. It's just how the Fitzgerald family is."

KICKSTARTING SUCCESS

Eric Migicovsky credits Waterloo Engineering's design projects for giving him the skills to create his Pebble smartwatch that smashed Kickstarter.com financing records earlier this year.

"I can't imagine what it's like going through engineering without working on something like Waterloo's fourth-year engineering projects," he says. "If I hadn't had that background where you're working on short four-month schedules and building things, I wouldn't be able to do what I'm doing now."

What the 2009 systems design engineering graduate is doing now is producing 85,000 smartwatches to meet the sales of over \$10.2 million generated in a mere 38 days through Kickstarter.com, a New York-based online funding platform in fields including technology, music and publishing. The Pebble project is the most successfully-funded venture in Kickstarter's four-year history.

Migicovsky came up with his original timely business concept while biking along the canals in Holland during a Waterloo Engineering exchange term in 2008. "I didn't want to risk dropping my new phone into the water, but I wanted to know why it was vibrating in my pocket," he said at the time.

The result of his bike ride was inPulse, a watch that connected wirelessly with BlackBerry® smartphones to indicate when the user had an email, message or call. Pebble is what Migicovsky calls the natural evolution of inPulse, of which about 1,500 were sold.

The biggest differences between the two watches are that Pebble connects with the iPhone and Android phones and has a much longer battery life. Pebble also features a unique e-paper display so the digital screen is visible in the sun. It comes with apps pre-installed, including an app to measure cycling speed, distance and pace through GPS, and a golf rangefinder app that supports more than 25,000 courses. Additional ones can be downloaded from

the phone so you can really make it your own, says Migicovsky.

The boost in sales from the Kickstarter funding has resulted in overwhelming attention from the media, including *Maclean's* magazine and ABC News, and the company increasing its staff from three to nine employees in just a matter of weeks this past spring. Six of those nine employees are Waterloo Engineering graduates.

Migicovsky is now living in Palo Alto, California, where Pebble Technology relocated last year. This past June, he visited the University of Waterloo and, along with Waterloo-based employee Bradley Murray, interviewed potential co-op students.

Wearing an inPulse T-shirt with its tag line "It's Time" printed across the front, Migicovsky says the biggest piece of business advice he's received along the way is that you need to make something people want and to do that you need to listen to them.

Murray, a Waterloo computer engineering graduate, agrees saying the key to the overwhelming demand for the Pebble watch is that company employees learned what people liked, as well as what they didn't like.

"The watch crossed the threshold where people went from saying 'that's cool, but I don't want to buy it' to 'that's cool and I really want to buy it,'" he says.

Another threshold will be crossed when the Pebble watch becomes available to the general public early next year. It will be sold through retailers for around \$150.

Eric Migicovsky's new Pebble smartwatch is a "natural evolution" of his company's InPulse watch shown here.

Photo © 2012, The Waterloo Region Record, Waterloo Region, Ontario Canada

"The watch crossed the threshold where people went from saying 'that's cool, but I don't want to buy it' to 'that's cool and I really want to buy it.'"



TAKING AIM AT CANCER

This year, more than 200,000 Canadians will be diagnosed with some form of cancer. For many of us, it's a disease that hits very close to home. And while the prognosis for patients continues to improve, 200 people across the country still die of cancer each day.

At Waterloo Engineering, researchers are applying their ingenuity to the issue, developing tools, instruments and processes that promise to transform how doctors diagnose and treat Canada's biggest killer.

Take the example of Frank Gu, who is the Canada Research Chair in Advanced Targeted Delivery Systems and a Waterloo chemical engineering professor. Today's chemotherapy drugs destroy cancer cells very effectively, Gu explains, but they also damage healthy cells in the process. By enclosing drugs in nanoparticles, Gu and his team can shield the body from toxic drugs, eliminating the side effects that often cut treatments short.

Next, they attach special biomarkers that let the particles home in on tumour cells. "Essentially we are adding a biological GPS," he says.

The result? Atomic-scale "smart bombs" that provide highly targeted treatments. "It's going to really revolutionize the way chemotherapy will be delivered in the future," Gu predicts.

There are still a few details to be resolved, like how to sidestep the body's immune system. As a co-op student, Ameena Meerasa (BASc '12, Nano) worked with Gu to examine which proteins the immune system attaches to different nanoparticles, tagging them for destruction and removal.

By scrutinizing how many tags are attached and what patterns they form, she laid the groundwork for identifying the best nano-vehicles for chemotherapy. "This could potentially lead to more efficient and more efficacious drug delivery," says the recent grad, who is heading off to medical school this month.

Fellow student Ryan Wagner (BASc '12, Nano) took a slightly different approach. During a co-op term, he researched nanoparticle drug delivery at Harvard Medical School. Here at Waterloo, he developed a starch nanoparticle for cancer treatment that won him this year's nanotechnology engineering design symposium award.

Currently, he's honing his business skills as a participant in The Next 36, an elite program designed to cultivate Canada's next generation of entrepreneurs. Wagner's ultimate goal is to launch his own nanotech company. "To make technology useful, you have to get it outside of the lab and bring it into the business world," he says.

Of course, before you can treat cancer, you have to diagnose it. That's where Erin Bedford (BASc '11, Nano) comes in. The doctoral candidate is designing biosensors that can quickly detect the disease through blood tests.

Thanks to a scholarship from the France Canada Research Fund and from the International Doctoral School for Functional Materials, she's splitting her time between Gu's lab in Waterloo and Claire-Marie Pradier's lab in Université Pierre et Marie Curie in Paris, working towards a joint PhD from both institutions.

"What we're doing is going to really revolutionize the way chemotherapy is delivered."



Chemical engineering doctoral candidate Erin Bedford is designing biosensors that can quickly detect cancer through blood tests.



Hamid Tizhoosh, a systems design engineering professor, has developed technology to help radiologists work more efficiently.

Her research involves trapping specific antibodies on the surface of the biosensor. The antibodies, in turn, bind to corresponding biomarkers for cancer, creating a sensitive detection tool that could reduce the need for biopsies.

"I wanted to work in technology and do something good for the world," says Bedford, explaining her career choice. "I found that when I was looking into nanotechnology."

Systems design engineering professor Alexander Wong (BASC '05, MASc '07, Comp; PhD '10, SD) had similar ambitions. That's why he's focusing his research on prostate cancer, a disease that affects 26,500 men across the country.

One of the biggest challenges in treating prostate cancer is pinpointing its location. Wong is developing new MRI modalities to do just that. Instead of taking out the entire prostate gland — a common approach to treatment — his technology will enable doctors to remove the tumour and leave everything else intact.

At the same time, Wong is developing algorithms for computer-aided diagnoses, creating a system that helps radiologists make faster and more accurate decisions about the location and severity of cancerous tissue.

"If it's detected early, there's an extremely high survival rate," says Wong, who recently received a \$140,000 Ontario Early Researcher Award. "Hopefully this will help people have a better quality of life."

Hamid Tizhoosh has also designed technology to help clinicians work faster and smarter.

Systems design engineering professor Alexander Wong, third from right, and members of his research group examine images of a prostate cancer visualization and analysis system.

"It's always about changing something small that affects the lives of many, many people."

As the systems design professor describes it, identifying and marking a tumour in medical images, such as CTs and MRIs, is currently more art than science. Give the same image to 10 different clinicians and they'll draw 10 different tumour outlines — so-called "contours" that can vary as much as 60 per cent. That means in many cases the wrong area is being targeted, leaving the cancer untreated and damaging healthy tissue.

"That's scary," says Tizhoosh.

To address the "inter-observer variability dilemma", he has developed software that learns to predict how each clinician draws contours. Not only can this speed up the process, it also enables doctors to adjust their result through comparison with a "consensus contour" based on the predicted contours of their colleagues.

In 2008, Tizhoosh launched his own company, Segasist Technologies, to commercialize the software. On top of that, he continues to teach and conduct research at the University of Waterloo. Whenever he's tempted to slow down, a visit to an oncology waiting room refreshes his resolve. "You see why you are doing this," he says.

According to Rick Culham, Waterloo Engineering's associate dean of research and external partnerships, Waterloo researchers are helping shape the future of cancer diagnosis and therapy. "It is rewarding to know that some of Waterloo's best and brightest engineers are improving the lives of Canadians facing the uncertainty of cancer through their remarkable contributions," says Culham.

Tizhoosh agrees. "It's always about changing something small that affects the lives of many, many people," he says.



SPARKING DISCUSSION THROUGH DESIGN

Marianna De Cola is making waves at the prestigious 2012 Venice Biennale in Architecture with “Migrating Landscapes”, her entry that includes a mobile system of wave energy that harnesses the power of the sea and monitors water quality in remote Newfoundland.

Attracting over 170,000 international visitors and millions of online viewers from August to November 2012, the Biennale is enabling School of Architecture graduate De Cola (BAS '08, March '11) to spark discussion about the people and politics of Newfoundland.

De Cola's passion for Newfoundland developed a few years ago while she vacationed on its remote southern coast that was recommended to her by a photography professor for its scenic beauty. There, she connected with residents and learned how communities were shrinking after the collapse of the cod fisheries. “They told me the government was pushing them to re-settle because services like healthcare couldn't be provided in such a remote place,” she says.

Deciding to base her thesis on this issue, she returned to the area several times to research and witness the last days of the community of Grand Bruit. In 2009, the community had an aging population of only 31 residents. After accepting a government payout to re-locate in 2010, they packed up to move by ferry to Burgeo and to Port Aux Basque. Since the boat was small, it took several months to move everyone's belongings, De Cola explains. Riding along with the residents on one of the last ferries leaving she had tears in her eyes knowing Grand Bruit wouldn't exist anymore.

That experience sparked her interest. “I battled with what I could do for those communities,” she says. With no connection to the energy grid, those coastal areas were powered by diesel generators delivered on passenger ferries. De Cola's master's thesis “Wave Energy” was envisioned as a system that could be moved along with the community. “That way they would always have the ability to settle successfully anywhere,” she says.

From that thesis, she developed “Migrating Landscapes” for a nation-wide competition for young architects about migration. After being featured at a regional competition in Halifax and in a national competition, De Cola's project was chosen as one of 18 Canadian entries at this year's Biennale that includes entries from 41 nations.

Made from plexiglass, wood and other materials, her design is a two-level map of Newfoundland's southern coast. It shows Grand Bruit and an anchor town in two scenarios: abandoned and lifeless, and still inhabited and full of life.

De Cola intends her project to be a provocation of ideas. She says that although the oil industry has brought jobs to Newfoundland, residents complain about the negative impact on the fish population. “Perhaps the government can explore how we can exploit this oil and give back to the fisheries that are so inherent in our history,” she adds.

Her plans after the Biennale? As well as working as an intern architect at Kohn Partnership Architects in Toronto, she'd like to tackle more international competitions. Eventually, she'd like to teach and share her passion for architecture and social change. “As a profession, we need to design things that respond to populations and don't inflict on populations.”

“As a profession, we need to design things that respond to populations and don't inflict on populations.”



Marianna De Cola's “Migrating Landscapes” is part of the 2012 Venice Biennale in Architecture.



“People interact with situations that management engineers optimize all the time and they don’t even realize it.”

DIRECT LINE TO SUCCESS FOR FIRST MANAGEMENT ENGINEERS

The next time you’re standing in line at a coffee shop, grocery store or hotel check-in counter, consider who had a hand in getting you through it faster. Chances are it was a management engineer.

Surprised? So was Amanda LeDuc who in June of this year became one of the first 40 students to graduate from Waterloo’s management engineering program, the first of its kind in Canada.

“If you look at a line at Tim Horton’s, you think it’s just a line. But as a management engineer, you can mathematically model and optimize it,” she says. “People interact with situations that management engineers optimize all the time and they don’t even realize it.”

LeDuc’s journey to becoming a pioneering student took a few twists. Back in high school she thought she’d become an architect — until discovering she couldn’t draw. Healthcare was out too. “I was too squeamish,” she admits. It wasn’t until she started looking at engineering and stumbled across Waterloo’s new program did she find the perfect fit.

“Management engineering at Waterloo just seemed to be everything I was looking for,” she says. “And Waterloo has such a great reputation that I wasn’t worried about being one of the first students.”

Waterloo’s first class of 40 management engineers convoked in June 2012.

The program has included real life fourth-year projects ranging from modelling a system to helping a potato chip company deliver to convenience stores at night, to building a software tool to track moment-to-moment exchange rates.

“The program applies rigorous engineering logic and methods to management systems,” says Rob Duimering, the department’s past associate chair for undergraduate studies. “We’re teaching students how to analyze them, critically think about them — and then improve them.”

It’s a formula that works. The class has won numerous awards, including the overall conference grand prize trophy at the Institute of Industrial Engineers National Student Conference in January 2012. Meanwhile, five graduates have joined consulting company Deloitte in Toronto and Vancouver.

Curtiss Luong, who graduated with LeDuc, says his optimization, IT and business training gives him skills today’s service sector needs. During a co-op term, he analyzed priority queues, like those found at hotels and airline counters. How much time do they save priority customers? What are the psychological effects when some people use them and others don’t? Luong had the math, IT and business knowledge to look at the issue from all sides.

“What management engineers bring to the table is incredibly useful,” says Luong. “Our skills are ones that companies can’t do without.”

CLASS NOTES



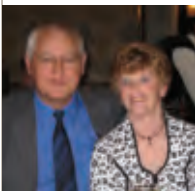
1962

CLASS REUNION – 50 YEARS SEPTEMBER 28-30, 2012

Bruce Hutchinson (Elect '62, '64) is the reunion class rep for the electrical engineering class of 1962. He says, "I encourage you come to the Waterloo Engineering Reunion this September. Let me know what events you plan to attend so we can both see how well we have aged!"
bhutchinson5@cogeco.ca

1967

CLASS REUNION – 45 YEARS SEPTEMBER 29-30, 2012



Bryan Armstrong (Mech '67) says "Mech Eng 1967 Grads, our 45-year reunion is near! Many of you have already been in touch and that's great. Just

drop me a line if you're still wondering what is going on."
bryana@sympatico.ca

1970

Stephen Harris (Mech '70) can be contacted at sjh529@stny.rr.com.

1971

James Aitken (Elect '71) is retired and living in Folsom, California. He's active in training border collies and competing internationally in dog agility events.
jim.aitken1@gmail.com

1972

CLASS REUNION – 40 YEARS SEPTEMBER 29-30, 2012

Dante Ferri (Chem '72) reports that he's been busy over the past year driving as a volunteer for the CAS out of Barrie along with caring for his two mini Dachshunds. Dante and his wife periodically leave their home in Wasaga Beach to visit their two daughters – one lives in Los Angeles and the other in Kingston, ON – and their grandchildren. Music, including guitar and harmonica, remains his passion.
danteferri@yahoo.com



John Woodrow (Chem '72) is the reunion class rep for his 1972 chemical engineering class. John says, "Thank you for the many positive

responses from classmates who plan to attend the reunion. I am still waiting to hear back from a few more and would appreciate receiving the profiles and recent pictures of classmates that I have requested. I can be contacted at jogold.woodrow@eastlink.ca."

1977

CLASS REUNION – 35 YEARS SEPTEMBER 29-30, 2012

Alar Korgemets (Elect '77), along with **John Burdett** (Elect '77), are the reunion class reps for this year's 35th reunion for the 1977 electrical engineering class. They're planning a 'reunion beginner bbq' at Alar and Linda's place for the Friday night and invite classmates to email either John at johnburdett@sympatico.ca or Alar at korge@golden.net.

Ronald Ristich (Chem '77) started with Dow Chemical in Sarnia, ON. He transferred to Fort Saskatchewan, then to Vancouver, back to Sarnia and to Lake Jackson, Texas in 1995. He moved to Pearland, Texas in May 2008. Ronald retired from Dow Chemical in July 2011 after 34 years of service. He now has his own company providing Lean Six Sigma training. Ronald and his wife Heather have two daughters, Jenny and Kaitlin, a son, Jason, and a new granddaughter, Madison.
ronristich@gmail.com

1982

CLASS REUNION – 30 YEARS SEPTEMBER 29-30, 2012



Thomas Chiu (Civil '82) is working as a district structural engineer with

the Office of Statewide Health, Planning & Development for California enforcing building code compliance for all hospital construction in the state. He says, "My wife, Julie is a banker. My eldest daughter, Christine graduated from UCLA last year with a major in psychology and a minor in education. She is now pursuing her master's degree in education at UCLA. My son, Eric, is in 7th grade. I will be looking forward to retirement when Eric graduates from college."
Tchiu88@charter.net

Sue Eastwood (Chem '82) is the reunion class rep for the 1982 chemical engineering class. In addition to the Waterloo Engineering events, Sue has arranged an afternoon of golfing and/or socializing for the class on Friday, September 28 at the Grey Silo Golf Course. She says, "Even if you don't golf, please join us at the club house for a relaxed afternoon and a buffet dinner. We've also booked a party room at the Waterloo Inn for Saturday night following the reunion dinner, so be sure to come there to continue the festivities!" Contact Sue if you'd like to participate in the additional events.
stark.eastwood@gmail.com

1986

William Weber (Mech '86) can be contacted at wcpeng@gmail.com.

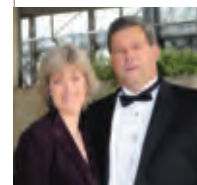
John Wieser (Civil '86) completed the sale of his project management/management consulting company Project Control Group Inc. to Stantec Consulting Ltd. in 2010. He is now working with Stantec on the transition and integration of PCGI's specialized services within Stantec's offices across Canada and is enjoying more time with his wife Charlene and their two kids.
john.wieser@stantec.com

1987

CLASS REUNION – 25 YEARS SEPTEMBER 29-30, 2012

Rob Gulbranson, Paul Moynihan, Blair Russell and Mike Schweigert (Chem '87) are the reunion reps for the chemical engineering class of 1987. They say, "We are looking forward to our 25-year reunion and hope as many classmates as possible come to Waterloo and join in on the festivities – feel free to contact any of us: Rob Gulbranson at chemicaleng1987@gmail.com; Paul Moynihan at Paul.Moynihan@Rothschild.com; Blair Russell at chemicaleng1987@gmail.com; and Mike Schweigert at michael.schweigert@utoronto.ca."

1991



Josephine Hill (Chem '91, '92) was chosen as the recipient of the APEGA Women in Engineering and Geoscience Champion Summit Award.

Josie is pictured here with her husband, **Richard Frayne** (Elect '89).
jhill@ucalgary.ca

1992

CLASS REUNION - 20 YEARS
SEPTEMBER 29-30, 2012

1994



Angel Yau (Elect '94) became the CEO of Kim Eng Securities (HK) Limited last year.
asyyau@gmail.com

1997

CLASS REUNION - 15 YEARS
SEPTEMBER 29-30, 2012

1999

Jeff Barnard (Civil '99) became engineering manager at AFI Hydro Inc. in Paris, ON during October 2011. AFI designs, fabricates and installs water control gates and hoisting equipment for large hydro projects throughout Canada. Jeff is still living in Breslau, ON with his wife and two sons.
jbarnard@afihydro.com

2000

Ed Kim (SD '00) and his wife, Claire, are celebrating the recent arrival of their first son, Theodore.
eddy@eddykim.com

2002

CLASS REUNION - 10 YEARS
SEPTEMBER 29-30, 2012



Danny Chow (SD '02), the reunion class rep for systems design engineering 2002, recalls the joyful anticipation while unboxing his first digital camera 10 years

ago. He has the same feeling about the reunion this September and looks forward to catching up with the growing families of SysDe9'ers. He hopes to see you there! Ping Danny with your thoughts, ideas and questions.
dtchow@alumni.uwaterloo.ca

Malgosia Green (SD '02), founder and CEO of Savvica in Toronto, was named one of the 20 Young Women in Power by Canadian Business Magazine for 2011.
heygosia@gmail.com



Jason Tham (SD '02), CEO of Nulogy Corporation, was awarded the AceTech Ontario Leadership

Award for Innovation, Growth and Leadership by the AceTech Network of CEO's.
jason@nulogy.com

2004



Kurtis McBride (SD '04, '08), co-founder and CEO of Miovision Technologies Inc., was named the

recipient of the 2012 Peter Brojde Award for Canada's Next Generation of Executive Leadership by the CATA Alliance.

2007

CLASS REUNION - 5 YEARS
SEPTEMBER 29-30, 2012



Julie Kim (MSci '07) has been nominated for a Canadian Comedy Award in the category of Best Stand-Up Newcomer. She was a

gala performer at the 2012 Halifax Comedy Festival that will be aired on CBC next year. Julie has performed in Toronto, Ottawa, Vancouver, Victoria, Montreal, Winnipeg, Halifax, Boston and Chicago. She is also a speaker and delivers a broad range of corporate hosting and facilitation services.
www.juliekimcomedy.com

2008



Christopher V. Olekas (Comp '08) is currently working in embedded software development at Magnum Semiconductor in Waterloo.
chris.olekas@gmail.com

2009



Robert Hoyoung Jung (Mech '09) says, "I relocated to Bristol, England in 2011 to join Airbus. Currently, I work in the flight physics department, specializing in

component loads computation. It's both an exciting and stressful time for us as we await the launch of a new aircraft family next year!"
robertjung@alumni.uwaterloo.ca

IN MEMORIAM

Gordon S. Aitken (Elect '69)
Douglas J. Andrews (Civil '77, '79)
James P. Ayres (Arch '74, '76)
Allen G. Barnstaple (Mech '69)
Gerrit J. Bijl (Chem '92)
Stalin A. Boctor (Elect '67, '70)
Ernie R. Brubacher (Elect '69)
William G. Chalmers (Arch '71, '73)
Justin T. Chan (SD '01)
Peter F. Cole (Civil '72)
David J. Edgar (Mech '77)
Ralph D. Edgecombe (Civil '72)
Hugh R. Etherington (Civil '62)
William R. Finlayson (SD '76)
Bernard A. Fransen (Civil '62)
William Gregson (Civil '72)
Donald E. Grierson (Civil '64, '66, '68)
Warren L. Leonhard (Elect '85)
Michael Jurisich (Civil '96)
Dennis J. Morgan (Civil '81)
Gordon N. Munn (Civil '74)
Thomas W. Phillips (Mech '70)
Robert H. Porter (Mech '71)
Glen A. Schabler (Civil '76)
Erlane F. Soares (Civil '76)
Denis P. Stelmack (Elect '86)
Clifford C. Summers (MSci & SD '69)
William R. Swain (Civil '67)
David S. Tam (Civil '66, '73)
James F. Thomerson (Chem '77)
James M. Thomson (Mech '71)
Robert J. Tromp (Elect '87)
Charles A. Vanoverbeke (Mech '87, '10)
Arnold A. Van Winden (Civil '85)
Edward R. Waluska (MSci '78)
Alfred T. Windatt (Mech '73)
Robert J. Wollcocks (Civil '73)



A special iron ring ceremony will be held for the Waterloo Engineering Class of 1962.

UPCOMING EVENTS

MIKE AND OPHELIA LAZARIDIS QUANTUM-NANO CENTRE GRAND OPENING

Date: Friday, September 21, 2012

Time: 10 to 11:30 a.m. (tours to follow)

Location: Mike and Ophelia Lazaridis Quantum-Nano Centre, University of Waterloo

Join us at the official grand opening of the newest building on campus. The celebration will include a ribbon-cutting ceremony, tours of the building and refreshments.

TD WALTER BEAN LECTURE

Date: Thursday, September 27, 2012

Time: 7 to 10 p.m.

Location: Humanities Theatre, Hagey Hall, University of Waterloo

The lecture entitled "Averting Disaster: coping with earthquakes, tsunami and nuclear meltdowns" will be delivered by Norio Okada, a former professor at the Disaster Prevention Research Institute at Kyoto University and former president of the Japan Society of Natural Disaster Science.

The much-anticipated Mike and Ophelia Lazaridis Quantum-Nano Centre will open its doors September 21. A public open house will follow on September 29.



REUNION FOR THE CLASS OF 1962

Dates: September 28 to 30, 2012

Location: University of Waterloo and Waterloo Inn

Waterloo Engineering's first golden anniversary reunion begins Friday, September 28 with a special Iron Ring Ceremony, an obligation renewal, followed by an Iron Ring Stag at the University Club on Friday evening. The next day features the Back To The Classroom Lecture (see details below), a lunch buffet, an open house in the Engineering 5 building and tours of Waterloo Engineering buildings. A memorable reunion dinner will be held Saturday night and festivities will conclude with a brunch on Sunday.

REUNION FOR THE CLASSES OF 1967, 1972, 1977, 1982, 1987, 1992, 1997, 2002 AND 2007

Date: September 29 and 30, 2012

Location: University of Waterloo and Waterloo Inn

Saturday's events feature the Back To The Classroom Lecture (see details below), a lunch buffet, an open house in the Engineering 5 building and tours of Waterloo Engineering buildings. A memorable reunion dinner will be held Saturday night and festivities will wrap up with a brunch on Sunday.

Register for reunion events at:

<http://uwaterloo.ca/engineering/alumni/reunions>

BACK TO THE CLASSROOM LECTURE

Date: Saturday, September 29, 2012

Time: 10:30 a.m. to 12 noon (EST)

Location: Internet (accessible worldwide)

Keith W. Hipel (BASC '70, Civil; MASc '72, SD; PhD '75, Civil), a Waterloo systems design engineering professor, will present the Back To The Classroom Lecture entitled: "Tackling Climate Change: A System of Systems Engineering Perspective."

The lecture will be available online by live streaming video and then will be offered as an archived video after the event.

MIKE AND OPHELIA LAZARIDIS QUANTUM-NANO CENTRE PUBLIC OPEN HOUSE

Date: Saturday, September 29, 2012

Location: Mike and Ophelia Lazaridis Quantum-Nano Centre, University of Waterloo

The open house will include tours of the building, family-friendly activities and a special science concert with Jay Ingram of the Daily Planet and his band.

WATERLOO

GO ENG GIRL

Date: Saturday, October 13, 2012

Time: 9 a.m. to 3 p.m.

Location: Rod Coutts Engineering Lecture Hall,
University of Waterloo

Go Eng Girl is an opportunity for Grade 7-10 girls across Ontario to learn more about the exciting world of engineering. The free University of Waterloo event includes fun, hands-on activities with mentoring from current women Waterloo Engineering students, special guest speakers, an information fair and a free lunch. To find out more, contact Rohini Wittke at rwittke@uwaterloo.ca or **519-888-4567, ext. 35239**.

WATERLOO ENGINEERING ALUMNI SKI DAY

Date: Friday, January 18, 2013

Time: 8:30 a.m. to 4:30 p.m.

Location: Osler Bluff Ski Club, Collingwood

Hit the slopes and join us for this annual event hosted by Steve Vokes (BASc 1977, Civil). The day includes skiing, timed runs, lunch, and prizes awarded at the après ski at this gorgeous private ski club.

The Ask an Eng Alumni mentorship program provides guidance and direction.



WATERLOO ENGINEERING ALUMNI CURLING BONSPIEL

Date: February 2, 2013

Time: 9:30 a.m. to 6:00 p.m.

Location: High Park Curling Club, Toronto

Curlers of all levels are encouraged to join the curling bonspiel for a fun-filled day on the ice with fellow classmates. Enter singles, couples and teams. Beginners are welcome and will receive a free introductory lesson.

CLASS REUNIONS FOR 2013

Dates: September 28 and 29, 2013 for the Classes of 1963, 1968, 1973, 1978, 1983, 1988, 1993, 1998, 2003 and 2008

Mark your calendar!

CLASS REPS WANTED!

Volunteer to be a Class Rep for your upcoming class reunion and be part of the action! Register today by emailing engineering.alumni@uwaterloo.ca or calling **519.888.4567 ext. 36838**.



GREETINGS ALUMNI

September is a time to celebrate as we mark the 50-year anniversary of the graduation of our first engineering undergraduate class. Alumni from the Class of 1962 are invited to two special reunion events: the Iron Ring Ceremony (obligation renewal), and the Iron Ring Stag.

We're also celebrating the one-year anniversary of the Ask an Eng Alumni mentorship program. It's an easy-to-use online program that has engineering alumni mentoring current engineering students and offering them advice on a variety of topics including leadership, ethics and career direction. We're always looking for new mentors – if you'd like to volunteer, please contact me at gosia.brestovacki@uwaterloo.ca or 519-888-4567, ext. 36838.

I hope you enjoy reading this issue of WEAL. Please send me your Class Note and any story or profile suggestions for future issues of WEAL or eWEAL.

Sincerely,

A handwritten signature in black ink that reads "G Brestovacki".

GOSIA BRESTOVACKI, Senior Alumni Officer

For the latest Waterloo Engineering alumni events, visit engineering.uwaterloo.ca/alumni

AN AMBASSADOR FOR HER PROFESSION

You won't find the "Y chromosome" among the requirements listed on engineering school application forms. Yet in first-year classes across the country, men still outnumber women five to one.

Rana Tehrani Yekta (BASc '10, Civil) wants to change that ratio. As a volunteer with Go Eng Girl, Waterloo's Women in Engineering group and the Canadian Association of Girls in Science, the outgoing civil engineering graduate student has been working with girls and young women to turn them on to engineering.

Now her efforts have received an extra boost, thanks to the 2012 Vale Master's in Engineering Scholarship. As part of the \$10,000 prize, Tehrani Yekta is thrilled to serve as an ambassador for her profession, talking to high school students about careers in engineering.

"Most of the girls have the perception that they should leave math and sciences to the males," she explains. "I want to break those stereotypes."

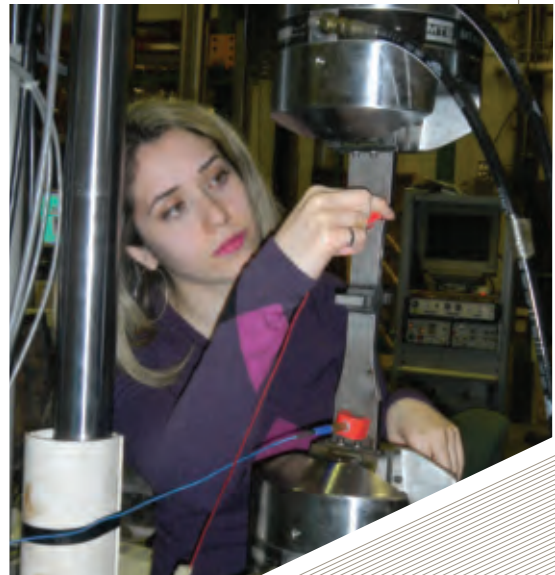
From an early age, Tehrani Yekta loved learning how things work. When she moved from the Middle East to Canada at age 16, this passion drove her to overcome culture shock and language barriers, earning Tehrani Yekta a spot in first-year engineering at Waterloo in 2005.

The same determination kicked in when she failed to win the Vale scholarship last year. Undaunted, she contacted the judging panel and used their feedback to improve her application this year. "Sometimes you have to fall to stand up even taller and stronger," she says.

When she's not busy promoting her chosen career, you'll find Tehrani Yekta in the lab, developing criteria for ultrasonic impact treatments used to improve welds on bridges. Next up comes an internship with Vale's central engineering department in Thompson, Manitoba — a part of her scholarship package.

As for the future, she knows exactly what direction she wants to take. "I plan to work to be a successful engineer and great role model for women considering the career."

Rana Tehrani Yekta, civil engineering master's student



WATERLOO ENGINEERING

WEAL

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<http://alumni.uwaterloo.ca/privacy>

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