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WATERLOO ENGINEERING ALUMNI LETTER

WATERLOO

INSIDE THIS ISSUE



TRANSFORMING EDUCATION THROUGH TECHNOLOGY

While a systems design engineering student, John Baker founded Desire2Learn, a provider of personalized learning solutions to help schools, universities and companies deliver engaging e-learning. Fifteen years later, he feels like the company is still in the early stages of the online transformation of education. [See page 3]





FROM THE DEAN

As Canada's largest engineering school, Waterloo continues to lead the way in engineering and architecture education with more than 8,800 undergraduate and graduate students enrolled in our programs this fall. We are currently educating about 16 per cent of Ontario's and seven per cent of Canada's undergraduate engineering students. While interest in engineering programs has risen steadily over the recent years, our share of first choice applicants has grown considerably. The total number of domestic and international students who applied for fall 2014 was 11,435 for 1,616 first-year spots.

I'm especially proud that the number of women admitted into our first-year programs has more than doubled in the past decade and we have 460 women students enrolled for fall 2014.

This growth is a direct result of the leadership of Professor Mary Wells and a team of dedicated faculty and staff. As the Faculty's Associate Dean of Outreach and the current Chair of Women in Engineering for Ontario, Mary has developed and implemented a strong vision for Waterloo Engineering Outreach that consolidates our outreach and diversity activities.

While our numbers keep increasing, so too does the relentless demand for our exceptional programs. Last year, we set in motion expansion plans to gradually increase our current enrolment by two per cent each year over the next seven years by introducing biomedical engineering and expanding our mechatronics engineering program.

This month, we welcome the first class of biomedical engineering, our 13th undergraduate engineering program. The combination of interdisciplinary faculty expertise and the growing demand for highly-skilled researchers and practitioners makes it the ideal time to introduce this exciting new offering. Prospective students feel the same way: over 700 applications were received for the initial 45 spots.

Our new and immersive program is unique in Canada because of its strong focus on modelling and design, combined with invaluable co-operative workplace experience.

To meet our country's expanding needs for mechatronics engineers, we have begun increasing enrolment in our mechatronics program, which will gradually add another 120 students over the next few years. Our mechatronics engineering graduates have discovered global success in their entrepreneurial pursuits, and they credit Waterloo Engineering with giving them an edge in hardware-software integration skills such as instrumentation, sensor technology, robotics and automation.

On the other side of the world, we are upgrading and expanding the facilities used by students in our School of Architecture's highly-successful Rome program. Work includes exposing the original historic ceiling, resurfacing walls, refinishing floors and installing new lighting and furnishings. Electrical and technology upgrades are also taking place. The renovations, to be completed by early 2015, will enrich our students' Rome experience and allow for other University of Waterloo programs to be run in the space.

INCUBATING EARLY

During the past year, our unique entrepreneurial eco-system has garnered considerable media attention. We're now known as Silicon Valley's Canadian feeder school (*Bloomberg Businessweek*, October 2013), the place to be if "you've got a big technology idea to turn into a billion-dollar company" (the *Globe and Mail's* Canadian University Report) and by our "undeniable reputation throughout tech of the kind of engineering talent that comes out of the University of Waterloo" (Alexis Ohanian, Reddit).

To enhance the skills and knowledge of our budding entrepreneurs, we have introduced the Entrepreneurship Option in Engineering. Students are now able to add electives in Venture Creation and Corporate Entrepreneurship, offered by the Conrad Business, Entrepreneurship and Technology Centre. Students enrolled in these courses have access to industry mentorship, scholarships for entrepreneurial ventures and our enterprising culture that has given rise to over 500 startups, including alumnus John Baker's Desire2Learn featured on the following page.

At the end of this month, we celebrate the 50th anniversary of the Class of 1964, our third class of engineering graduates. I look forward to meeting them and others attending their significant Waterloo Engineering reunions.

Sincerely,

Pearl Sullivan, Dean, Faculty of Engineering

The growth in the number of women in our first-year programs is a direct result of the leadership of Mary Wells, Engineering's Associate Dean of Outreach, and a team of dedicated faculty and staff.





“It’s those individual stories that really motivate me and speak to what we’re doing as a company.”

John Baker (BASc '99, SD), founder and CEO of Desire2Learn, meets with Waterloo Engineering graduates and D2L employees to discuss new ways of delivering engaging online learning. From left, David Horne, John Baker, Dana Frigula and Gary Abbott.

TRANSFORMING LEARNING

Back in 1999, education was mainly delivered in a traditional, one-size-fits-all format and things like acetate overhead projections were still being used as teaching tools in the classroom.

John Baker, a fourth-year Waterloo systems design engineering student at the time, was looking for a project that would interest him and he came up with the idea of transforming education through technology.

“Literally, I couldn’t think of anything more exciting than helping learners around the world and making education better,” he recalls.

While still in school, Baker founded Desire2Learn (D2L), a provider of personalized learning solutions to help schools, universities and businesses deliver engaging online learning. His company started by looking at a number of areas, including the activities of learning.

Recognizing there are students who need extra help, D2L created a system to support adaptive learning pathways so if a student is struggling, more resources and content are provided. It also investigated ways to ensure students living in remote areas or with disabilities such as blindness have access to the best online learning resources.

Fifteen years later, the Waterloo Region-based company employs about 800 full-time staff members and co-op students, many of them from Waterloo Engineering, and its systems are used by more than 1,100 organizations in 20 different countries.

Despite this, Baker feels his company is still in the early stages of the online transformation of education.

“We’re just getting warmed up,” he says. “It takes a long time to go through and have a fundamental change on a huge system like education. But it’s one of those things you can definitely get passionate about and put your life behind.”

AN ACCOMPLISHED ENTREPRENEUR

Recently called one of Canada’s most accomplished entrepreneurs by *Forbes* business magazine, Baker has received numerous honours throughout the years including Waterloo Engineering’s Young Alumni Achievement Medal in 2010 and the Ernst & Young Entrepreneur Award in the Software and Technology Category in 2013.

But perhaps the greatest accolade for Baker is the feedback he receives about D2L’s programs, including from a University of Waterloo professor whose autistic son was struggling in school. Thanks to D2L, the student, went from failing to the top of his class and is now starting college.

There’s also the single mother living in Doha, Qatar. By using D2L’s software she was able to finish her university undergraduate degree, go on to pursue a master’s, and with those qualifications in hand, be hired as a dean of nursing.

“It’s those individual stories that really motivate me and speak to what we’re doing as a company,” he says.

THE IMPORTANCE OF GIVING BACK

What also motivates Baker is volunteering his time throughout the community. In 2013, he was appointed to the Social Sciences and Humanities Research Council of Canada and he sits on a number of boards, including Waterloo Engineering’s Dean’s Advisory Council and Canada’s National Ballet School.

“I believe the arts are going through a transformation just like learning,” he explains. “I see the potential of leveraging our technology to create an international dance hub so choreography may be shared globally and students can learn from each other, as well as the Bolshoi and other renowned ballet companies. Just think of watching that archive in another 100 years!”

Baker’s desire to make a difference to education is part of his DNA: his grandfather and both parents became teachers and his father now runs a private school in Bayfield, ON.

“I finally convinced him to switch from the software someone had built him to ours,” says Baker with a smile, adding, “he’s not our biggest client, but he’s a good one.”

FACULTY NEWS

RESEARCH EXCELLENCE ENDORSED

Critical research into health care operations, medical imaging systems, micro-nano devices for cancer detection and smart energy distribution received a boost in March with four professors receiving new and renewed appointments as Canada Research Chairs.

Alexander Wong holds the new Canada Research Chair in Medical Imaging Systems. The systems design engineering professor is developing medical imaging systems to improve the understanding and early diagnosis of cancer, making it easier to use minimally invasive therapies for treatment, improving recovery times and reducing discomfort for patients.

As the new Canada Research Chair in Health-Care Operations Management, Hossein Abouee Mehrizi of management sciences is developing systems to more efficiently admit higher acuity patients and contribute to informed discharge planning guidelines for hospitals.

John Yeow received a renewed appointment as the Canada Research Chair in Micro and Nano Devices. The systems design engineering professor is developing miniature devices and highly selective sensors that will help create new medical instruments for diagnosing and treating disease.

Ehab El-Saadany's term was renewed as the Canada Research Chair in Smart Energy Distribution Systems. The electrical and computer engineering professor is examining how to integrate decentralized power generation sources into the central electricity system.

"The targeted research areas reflect our commitment to advancing technologies that will improve the human condition," says Pearl Sullivan, dean of engineering.

NEW LAB CREATED FOR NANO TO QUANTUM-SCALED RESEARCH

A lab designed for research programs ranging from quantum computing to nanoelectronics opened its doors in June.

The 1,200-square-foot Molecular Beam Epitaxy facility, located in the Mike & Ophelia Lazaridis Quantum-Nano Centre, is equipped to grow novel compound semiconductor materials to accelerate progress in nanotechnology, quantum computing and quantum encryption, as well as other areas of research.

Zbig Wasilewski, an electrical and computer engineering professor and the Waterloo Institute of Nanotechnology Endowed Chair, heads up the new Molecular Beam Epitaxy facility.

"Molecular Beam Epitaxy is the most powerful technology for materializing the devices of the future," says Zbig Wasilewski, an electrical and computer engineering professor who heads up the lab.

The lab received funding from the Canada Foundation for Innovation, the Natural Sciences and Engineering Research Council of Canada (NSERC) and the University.

IMAGE PROCESSING EXPERT AWARDED FELLOWSHIP

Zhou Wang, an electrical and computer engineering professor, is the recipient of an NSERC E.W.R. Steacie Memorial Fellowship for his work in understanding how people view the quality of images and videos.

Wang leads a research team that is developing next-generation ways to measure and improve the visual experience for a variety of multi-media applications. Over the past decade, Wang has developed the standard for objectively measuring image quality, called the Structural SIMilarity (SSIM) index. Companies such as Cisco, Motorola, Ericsson AT&T and NBC rely on the SSIM method to deliver products and services with the best possible perceptual quality to hundreds of millions of viewers worldwide.

"One of our goals is to develop a flexible multi-dimensional assessment framework that closely reflects the experiences of the end user," Wang says. "Our research can subsequently be used to guide the design and optimization of a wide range of network visual communication products and services."

STUDENT RECEIVES UNIVERSITY TEACHING HONOUR

Rania Al-Hammoud was one of just three University of Waterloo students to be awarded the 2014 Amit & Meena Chakma Award for Exceptional Teaching by a Student.

Al-Hammoud completed both her master's and doctoral degrees in civil engineering at the University of Waterloo. From Fall 2010 to Fall 2013, she taught a total of 10 undergraduate courses in the civil and environmental engineering program.

Students describe her as a hard-working, caring and intelligent instructor. As one student wrote, "she would not rest until we not only knew how, but also why."





“Our goal is to create the most prestigious program in the co-op landscape.”

Chamath Palihapitiya and Brigette Lau introduced the Palihapitiya Lau ECE Venture Creation Fund and the Social +Capital Partnership Fellows Program for engineering students.

“This school stretched me intellectually as did my co-op jobs,” says Palihapitiya. “I’d come back to school brimming with confidence and knowing that I could be successful in the work force.”

Two years ago, Palihapitiya and Lau attended the electrical and computer engineering Capstone Design Symposium and ended up investing \$3.5 million in a wearable technology concept that has evolved into a California-based startup known as Athos. The company now produces fitness apparel that measures key performance indicators such as muscle activity, heart rate and breathing.

“What first struck me was that if the technology was commercialized in an elegant way it would be something everyone would want,” says Palihapitiya.

Lau describes the Capstone Design Program as an eye-opening experience. Launched for electrical and computer engineering students the year after she and Palihapitiya graduated, Lau says she would have liked the opportunity to participate in the program.

“Co-op is wonderful because it allows us to see what working life is about,” she says. “But the reality of the work force after college or university is so different. It’s about organization, it’s about collaboration and the Capstone program helps you develop those skills needed to survive in the workforce.”

LEARNING BY FAILING

Palihapitiya agrees, saying the program gives students the infrastructure to support their inherent entrepreneurial talents and perhaps something more important — the opportunity to fail.

“You learn a lot more from the things that don’t work than the things that do,” he emphasizes.

For Palihapitiya, being an entrepreneur as well as a risk taker started years ago, when he ran blackjack games during lunch at his Ottawa high school to earn money. Today, he uses his poker playing skills in major tournaments, such as the World Series of Poker.

Not content to rest on his laurels, Palihapitiya would like to make a difference when it comes to improving sectors including education, financial services and health care.

“My hope is that I can be a part of several other billion-user movements like Facebook,” he says. “But this time I’d like to see them happen in areas that will be measured in ways beyond revenue and profit.”

THE UNCONVENTIONAL VENTURE CAPITALIST

If he’d followed his father’s advice, Chamath Palihapitiya would have become a medical doctor, likely with a successful family or surgical practice.

Instead, he took a different path, one that led to him graduating from Waterloo’s electrical engineering program with first class honours in 1999, becoming an original member of Facebook’s senior management team and, together with his wife, computer engineering alumna Brigette Lau, launching The Social+Capital Partnership three years ago.

Based in Palo Alto, the multi-million dollar venture capital fund incubates and invests in breakthrough companies in healthcare, education, financial services, mobile and enterprise software.

Palihapitiya and Lau were back on campus twice this year to launch initiatives. In January, they introduced the Palihapitiya Lau ECE Venture Creation Fund that will award \$40,000 to two fourth-year Capstone Design projects in combination with curriculum-embedded entrepreneurship training.

“The fund is meant to encourage students to explore their ideas and see if they can succeed,” Lau explains.

PAIRING STUDENTS WITH STARTUPS

Returning to the University of Waterloo in May, the couple unveiled The Social +Capital Partnership Fellows Program, which will pair engineering students with innovative startups in Silicon Valley.

“Our goal is to create the most prestigious program in the co-op landscape,” says Palihapitiya. “We’re offering more money, equity and exposure to the next swath of billion dollar companies.”

The pitch was certainly effective, as over 1,300 students applied to be part of the program.

Giving back to the Faculty is something the couple feels strongly about, with Lau saying they owe much of what they have today to Waterloo Engineering. That includes meeting each other their first week on campus 20 years ago this month.



Athos is creating a new standard in fitness wear.

THE NEXT WAVE OF ENTREPRENEURS

Athos is putting a new spin on wash-and-wear clothing.

Founded by Waterloo electrical and computer engineering grads Dhananja (DJ) Jayalath and Christopher Wiebe, the Redwood, California-based company is developing fitness clothes that can track your muscle exertion, heart rate and breathing activity. This data is wirelessly translated to a mobile app, enabling users to analyze and adjust their workout activities.

And when you're done working out, cleaning your Athos gear is as simple as tossing it in with the next load of laundry. The clothing and built-in sensors are entirely machine-washable.

Innovative? Absolutely. Yet the company is also an inspiration for senior engineering students working on Capstone Design projects each year. Not only did Athos start as a Capstone project, but its founders received funding from venture capitalist Chamath Palihapitiya and his wife Brigitte Lau. Both Waterloo Engineering graduates checked out Jayalath and Wiebe's invention at the 2012 electrical and computer engineering Capstone Design Symposium.

"We didn't know who Chamath was. We just knew he was better dressed than everyone else there," Jayalath jokes.

Athos isn't the only Capstone success story. Ground-breaking project ideas have also led to Intellijoint HIP™, the Myo armband and the Pebble smartwatch. So what new project might eventually make this list? Here's a snapshot of the winners of the first annual Norman Esch Entrepreneurship Awards for Capstone Design held in March. One or more of these innovations may just become the next best thing to hit the marketplace.

"A lot of companies are in the dark ages. We're trying to bring them to the point where they're capable of working in a just-in-time manner where they know what they need and when they need it."

FLOOD DEFENDER

The team. Jarret Cauchy, Scott Duncan (both Mechanical Engineering), David Lee (Faculty of Arts)

The elevator pitch. An automated system to reduce the rate and intensity of preventable water damage in apartment buildings.

Competitive edge. When a leak is detected from a dishwasher, water heater or other appliance, the system's sensor has the potential to automatically turn off the water intake into the building.

The last word. "The driving force behind Flood Defender is to make running an apartment building a little bit easier for a building manager," Jarret Cauchy says. The team is currently working part time on the system while developing patents and a network of contacts, including property management firms.



Lindsay Brock explains the advantages of her team's company, Grayscale Coatings, to engineering students.

GRAYSCALE COATINGS

The team. Lindsay Brock, Ioana Craiciu, Roy Lee, Farzana Yusufali (Nanotechnology Engineering)

The elevator pitch. An innovative, two-phase roof coating that cools in warm months and heats in cool months. Based on the material properties, the refracting index of coating particles change so light can be scattered. When it's cold, the material turns dark. Heat turns the material white to reflect sunlight.

Competitive edge. The material is perfect for geographic locations that swing hot and cold throughout the year, such as Canada.

The last word. "It's really simple and it works. Even for small houses, it will save the owners money," says Lindsay Brock, whose team is now applying for a full patent and looking into manufacturing steps.

MAJIK SYSTEMS

The team. Kamal Aman, Jared Evans, Adam Singer, Mike Tatham (Management Engineering)

The elevator pitch. A real-time monitoring system for factories and manufacturers that allows a variety of machines to “communicate” their data with each other.

Competitive edge. The system reduces downtime. With a MAJiK system in place, engineers and technicians will be able to pinpoint faulty machinery immediately, enabling them to skip past finding the problem and focus on solving it.

The last word. “A lot of companies are in the dark ages. We’re trying to bring them to the point where they’re capable of working in a just-in-time manner and know what they need and when they need it,” says Mike Tatham, who this month started Waterloo Engineering’s Master of Business Entrepreneurship and Technology program.

MIXBOX

The team. Ryan Bateman, Wen-Hao Lue, Peter Sobot, Chris Taylor (Software Engineering)

The elevator pitch. An iPad app that allows you to mix and combine songs to create new music with little expertise.

Competitive edge. Beat-matching and pitch-detection algorithms make remixing easier for music novices, opening up a new world of music-making for everyone.

The last word. “I’m excited about the ways we can facilitate learning and creation for people interested in making music, but don’t have the background to get started,” Wen-Hao Lue says. The team plans to continue working on Mixbox through Waterloo’s Velocity Garage program.

ON-THE-GO

The team. Nasif Addnan, Nick Ghotbi, Riley McLeod (Management Engineering)

The elevator pitch. A mobile app that records and splits expenses between users while travelling.

Competitive edge. Say goodbye to complicated Excel spreadsheets and grumbling travel companions. Considering that the North American post-secondary student market spends \$15-billion on travel each year, there’s a need for a simple app that adds up what friends spend while, for example, backpacking across Europe together.

The last word. “You can quickly add new expenses and share them with friends so everyone knows exactly how much money is spent along the way,” says Nick Ghotbi, who plans to perfect the app with his team members while they either work in the U.S. or attend grad school.

WEARABILITY

The team. Pratik Konnur, Chris Menezes, Marc-André Simard, Adam Thagard (Systems Design Engineering)

The elevator pitch. The company’s electromyography shirts measure electrical signals in muscles. The technology has been used for decades in laboratories to characterize neuromuscular disorders, perform ergonomic studies and measure athletic performance.

Competitive edge. No more aches and pains. The shirts could eventually reduce work-related musculoskeletal disorders, including sprains and strains in the lower back and neck.

The last word. “We’re excited about bringing this extensive research to the consumer market so that gym-goers can benefit from this cutting-edge research in a simple, non-intrusive way,” Marc-André Simard says.



The MAJiK Systems team members pitch their startup at the Norman Esch Entrepreneurship Awards for Capstone Design held last spring. In July, MAJiK Systems won \$25,000 in funding from Velocity, the University’s business incubator.



“Waterloo is a great hub for biomedical engineering, for medical devices, therapeutics, pharmaceuticals and more.”

Waterloo Engineering alumni created GestSure, a system that allows surgeons access to digital data through simple hand movements.

MERGING MEDICINE AND ENGINEERING

This September, 45 students enter a brand-new program at Waterloo: biomedical engineering. Emphasizing design skills and interdisciplinary expertise, it equips students to develop medical technologies, diagnostic tools, health monitoring systems and more.

However, the class of Biomed '19 won't be the first alumni to make an impact in the field. Thanks to a number of Waterloo Engineering graduates, operating room technology is undergoing significant transformations.

GAME-CHANGING TECHNOLOGY

March 2011. Sunnybrook Hospital, Toronto. A surgical oncology team is working to remove a complex tumour entwined around the patient's adrenal glands and pancreas.

At one point in the delicate procedure, Dr. Calvin Law puts down his scalpel, turns to a computer screen displaying an image of the tumour and, without touching anything, makes a gesture with his gloved hands. The image rotates, and three Waterloo Engineering grads in the operating room exhale in unison.

“It really was magic,” says Jamie Tremaine (BASC '06, Mechanical). Together with Matt Strickland (BASC '06, Electrical) and Greg Brigley (BASC '03, Computer), he had developed the GestSure system being tested that day.

GestSure solves a major frustration for surgeons. Because the operating room computer is not sterile or sterilizable, manipulating the CT scans or MRIs it displays means either playing backseat driver as a non-sterile nurse does it for you or doing it yourself and

then taking another 10 minutes to scrub before resuming surgery. Strickland, who pursued a medical career after completing his engineering degree, knew the challenges first-hand.

While out for a run on a warm fall day in 2010, Strickland, Tremaine and Brigley discussed using Microsoft's Xbox Kinect sensor to solve the problem. Three weeks later, they had a prototype.

Today, the GestSure system is commercially available and was featured in a Microsoft Super Bowl ad. “It's a total game-changer,” says Tremaine.

And with fellow Waterloo Engineering grad Sharon Fan (BASC '06, Mechanical) heading up the company's sales and operations, GestSure has its sights set on changing that game around the world.

Postdoctoral researcher Mihaela Vlasea is using the power of 3D printing to create artificial joints.



ROBO-SURGEONS

Imagine tying knots using a tiny needle fixed to the end of a chopstick. That's effectively the challenge for laparoscopic surgeons suturing tissue within the abdomen. Enter Karl Price, Angelica Ruszkowski and Brock Kopp. For their fourth-year design project, the 2013 mechatronic grads teamed up with Toronto's Hospital for Sick Children to create a robotic suturing tool.

At the end of a shaft slender enough to fit through an eight millimetre incision, you'll find a set of tiny jaws that can pass a suturing needle back and forth smoothly and accurately. The device promises to save time, freeing up the operating room for more surgeries. It's also more precise. "You can take advantage of the robot's perfect memory to repeat those procedures again and again," Price says.

Shortlisted for the prestigious 2013 James Dyson award — the only Canadian entry to make it to the international round — the prototype is now being honed at the SickKids' Centre for Image-Guided Innovation and Therapeutic Intervention.

PRINTING NEW KNEES

In Waterloo's Engineering 3 building, post-doctoral researcher Mihaela Vlasea (BSc '08, MAsc/PhD '14, Mechatronics) is exploiting the power of 3D printing to create artificial joints.

Over the course of her doctoral degree, Vlasea developed both the software and hardware to create knee joints that replicate the structure and porosity of real bone. Once implanted, the bio-ceramic scaffolding will gradually be replaced by the patient's own cells. "The idea is that the impact itself becomes the building block for bone," she explains.

As well as researchers at Waterloo, the project involved a University of Guelph veterinarian surgeon, material scientists from the University of Toronto's dentistry department and a cell-culturing expert, plus clinical pathologists and surgeons from Toronto's Mount Sinai Hospital.

Vlasea recalls how intimidated she felt attending her first meeting at Mount Sinai. "I walked in thinking, I'm an engineer. What do I know?" she says. But bringing together such diverse expertise paid off.

While the medical team applies for FDA approval based on the results of sheep experiments, Vlasea is fine-tuning the technology for commercial markets. "I think we're almost there," she says. "It's very promising."

MAKING SURGERY EASIER

As the son of an orthopedic surgeon, Armen Bakirtzian (BASc '08) wavered between studying medicine or engineering. Engineering won out, but when it came time to choose a fourth-year design project, he went straight to his dad. "I asked him if there was anything that we could do to create something to make his life easier as a surgeon," Bakirtzian recounts.

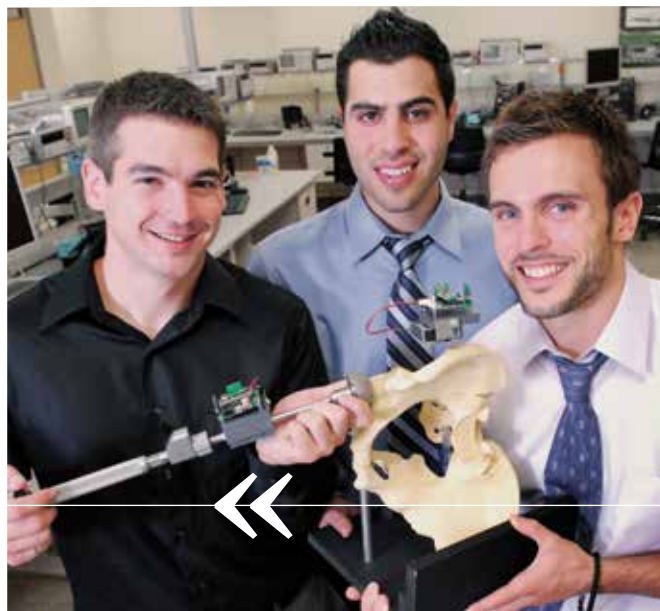
He learned that one of the greatest challenges during hip replacements is selecting and orienting the artificial joint correctly. Get it wrong and the patient ends up with one leg longer than the other or, worse, a premature dislocation requiring corrective surgery.

So, Bakirtzian got to work with fellow mechatronics classmates Richard Fanson and Andre Hladio. After several design iterations and tests, Intellijoint HIP™ emerged. Using sensors to provide precise measurements, the device helps doctors avoid premature hip dislocations and leg-length discrepancies. After graduation, the trio launched Intellijoint Surgical Inc. (previously known as Avenir Medical Inc.) to commercialize their creation.

Today, with a slew of national entrepreneur awards, \$6 million from investors and the approval of world-renowned surgeons, the Waterloo-based company is growing fast.

That's why Bakirtzian is excited about Waterloo Engineering's newest program. "There's a lot of talent here," he says. "Waterloo is a great hub for biomedical engineering, for medical devices, therapeutics, pharmaceuticals and more."

While still mechatronics engineering students, Richard Fanson, Armen Bakirtzian, Andre Hladio developed Intellijoint HIP™, a device to prevent joint misalignment.





“The program is structured so you come face to face with entrepreneurial ideas on a daily basis. Entrepreneurship becomes a lens through which you see the world.”

Physicians Ali Esmail and Femi Giwa both took a year off from their medical work to sharpen their entrepreneurial skills with MBET degrees.



MBET PROGRAM CHANGES HOW DOCTORS OPERATE

Ali Esmail, chief resident for the head and neck surgery department at the University of Manitoba, and Femi Giwa, a Nigerian physician, are a new breed of doctors without borders.

Both took a year off from their medical work to pursue Master of Business, Entrepreneurship and Technology (MBET) degrees at Waterloo Engineering's Conrad Business, Entrepreneurship and Technology Centre.

Esmail admits being away from the hospital for an entire year had its challenges, but he completed what he set out to do: develop and launch a pilot project with Manitoba eHealth that allows doctors, nurses, support staff and patients to share information over a cloud-based communication platform. No more paper or frustrating e-documents.

Medlinx, a software created by Esmail and fellow MBET student Vejeý Gandier, provides everyone on the team with access to crucial information, making patient hand-off easier and safer at the end of shifts.

“That’s the end game — not to work harder, but to work smarter,” he says.

For his part, Giwa came to Waterloo to acquire what he calls “tech entrepreneurial luggage.” After witnessing chaos and inefficiencies while he was in medical school in Nigeria, he became convinced that the largest failing of health care

systems lies in management challenges. Technology, he emphasizes, will have a major part to play in how medicine is restructured in the future.

While a master’s student, Giwa and Doyin Adetoro, a family doctor, created an innovative stethoscope called SiScope.

In producing the first version of SiScope, Giwa developed valuable partnerships across the university, particularly within Waterloo Engineering. For eight months, he worked with a group of motivated mechatronics and software engineering students to build a stethoscope that can be used by a group of people simultaneously. For instance, if a doctor is teaching medical students how to diagnose heart sounds at a patient’s bedside, the SiScope allows everyone to listen in. It’s a huge boon for doctors and other individuals who need hearing aids, but have trouble wearing traditional devices.

AMPLIFYING POTENTIAL IMPACT

Giwa says the MBET program changed the way he now thinks about opportunities. “It’s structured so you come face to face with entrepreneurial ideas on a daily basis,” he explains. “Entrepreneurship becomes a lens through which you see the world.”

Mark Weber, director of the Conrad Centre, isn’t surprised that mid-career professionals in medicine and other occupations such as law and engineering are showing interest in the MBET program. The training for those careers is rigorous and technical, but not primarily intended for people who want to launch new ventures or change the way their industry functions.

“Those individuals have lots of ability, but not necessarily the business training to unleash it in the most impactful way,” he says. “An MBET education can really amplify the potential impact of a smart, focused professional like Ali or Femi.”

CLASS NOTES

1964

CLASS REUNION – 50 YEARS
SEPTEMBER 27-28, 2014



Robert Korol (Civil '64, '67) is a professor emeritus at McMaster University whose research interests include steel and concrete post-failure energy absorption properties.



Don Roughley (Civil '64), president of Roughley and Company Consulting, has been the chief administrative officer for a number of municipalities in Canada,

including Waterloo, Scarborough and Victoria. Don is currently consulting with local governments on strategic sustainable community planning and partnerships.

Earlby Wakefield (Chem '64, '67) has been married since 1977 and is the father of two grown children. He is retired and lives in Guelph.

1965

Ted Krafft (Chem '65) retired in 2000, after a 35-year career with a major chemical company. The father of six children — his two sons are also engineers — and 11 grandchildren lives in Virginia with his wife.

ehkkrk@verizon.net

Mike Mallon (Civil '65) retired in 2002. He currently lives in Mississauga, near his six grandchildren.



Mark Wolnik (Civil '65) retired in 2001 after 35 years with two Ontario utilities in the natural gas industry. He is the co-owner of SW & Associates Inc., a pipeline-

inspection service company, and serves on the boards of directors of Markham District Energy and Global Emission Systems Inc.

1966

Benjamin Tripp (Elect '66, '70) spent numerous years researching how several features of the earth relate to various scientific theories. His book, *The Window of Life, A Theory of the Earth based on Asteroid Impact*, offers an explanation for submarine canyons, the death of the Woolly mammoth, the trees of Axel Heiberg Island in the high arctic, and the great Ice Age.

www.benatripp.wix.com/window-of-life

1968



André Leblanc (Mech '68) retired in November 2013, after 45 years of research and development at Pratt & Whitney Canada.

aleblanc6@sympatico.ca

1969

CLASS REUNION – 45 YEARS
SEPTEMBER 27-28, 2014

Everett J. Marwood (Mech '69) says his "sunset project" is to commercially exploit a green technology developed in Whitefish, Montana. It extracts, separates and converts gases and solids contained in biomass to commercial products.

1970



George Croll (Elect '70) is semi-retired from his family medical practice in Thunder Bay. He says the closest he gets to engineering these days is trying to restore old farm tractors.



Martin Holmberg (Elect '70) retired from his computing career in 2004. He is currently writing his memoirs, which will likely include his time at Waterloo.



Robert James (Mech '70) is retired and became a grandfather in 2013. He is involved in the Masonic Order, and also volunteers as an acolyte at his church in Etobicoke.

rcjames08@gmail.com



Veikko J. Kuronen (Elect '70) continues to tutor part time and plans to start his website buddybutler.com in 2015. The site will provide math, physics and electrical aides.



Frank Pawlitz (Elect '70) retired in 1999 after several years of operating The Control Registry, his consulting engineering company. Since retiring, he and his wife have enjoyed traveling south during the winter and living aboard their sailboat during the summer.

pawlitz@hotmail.com



ENGINEERING BACKGROUND PUTS WIND IN HIS SAILS

In 2009, **John Roper**, an electrical engineering graduate from Waterloo's inaugural class of 1962, was sailing in strong wind off the British Columbia coast when he encountered the unexpected.

Trying to reduce the front sail of his 37-foot Seabird cutter, the furling mechanism jammed.

Roper started the engine, hoping to use it to head back to Gibsons Landing Harbour on the Sunshine Coast, Roper's home and a community made famous by the classic CBC *Beachcombers* television show. But the engine died and Roper, a sailing instructor with two students along for the sail, had to rely on his emergency training.

After tacking for hours, sailing a zigzag pattern using only the wind, the three finally made it.

"My students sure got some great lessons that day," he says now with a laugh.

Roper became a sailing instructor in 1985 after an engineering career in Montreal, Calgary and Vancouver. Still, he says that engineering training, with its focus on problem solving and systematic thinking, has been helpful not only in emergency situations, but while taking his clients out on his company's five-day "cruise and learn" program. He must keep tides, weather, vessel aerodynamics, traffic and navigation in mind at all times.

After nearly three decades as an instructor, Roper says sailing the temperate and sheltered waters of the Salish Sea and exploring the Gulf Islands is still a rush.

"We're not concerned about cell phones or computers," he says. "It's a great feeling to be using the forces of nature to propel you to a destination."

www.sailcruise.net

1971



Gary Wedlake (Chem '71) reports that after leaving Waterloo, he pursued a doctoral degree at McGill University and then taught chemical engineering at

the University of Alberta. In 1979, he joined a PVC compounding company in North Carolina, which led to positions in production, sales and product development. In 2002, he and his wife founded their own PVC compounding company in Tennessee.

1972



Peter Collins (Mech '72) retired in December 2013 and now lives with his wife and family in Georgia.
pcollins48@icloud.com

Robert Maki (Civil '72) was the head of the City of Vancouver's building department for 24 years, retiring in 1998. Since then, he has travelled to many places, including China, Russia, Europe, Ukraine and Mongolia.

1973



Alan Heartfield (Elect '73) is the lead commissioning engineer for a spillway project being built by Peter Kiewit Infrastructure (PKI) for Manitoba Hydro.

Alan's company, L33T Engineering Ltd, was subcontracted by PKI.

Robert Rennie (Mech '73) studied to become a United Church minister after finishing his mechanical engineering degree. He joined the Canadian military as a chaplain and, after retiring from that role, lived in Australia for a number of years before returning to Canada.
bob30@sympatico.ca

1974

CLASS REUNION - 40 YEARS SEPTEMBER 27-28, 2014



Chris Avent (Mech '74) retired after 40 years in the steel industry, with his last position as a corporate environmental manager for Gerdau Steel. He lives near

Minneapolis with his family and five grandkids.
cwavent@msn.com



Mike Gurski (Arch '74) retired in 2011 only to start consulting work in privacy management and governance. He spent his early career with the Ontario Government, and later joined

Bell Canada as the founding director of the Bell Privacy Centre of Excellence.



Wyman Jones (Civil '74) presented at the 20th Annual Wheel Rail Interaction Conference in 2014. He spoke about his involvement in improving the performance of LA's Metro Rail Transit System.

Nat K. Natarajan (Elect '74) worked 15 years at TiE Communications and 23 years with Toshiba Canada, before retiring about two years ago. He lives in Brampton, ON.
natkrishna@gmail.com

1975



George Adams (Mech '75, '76) continues to advance his seventh company, Ventripoint, which recently received FDA approval for its product to diagnose heart disease.

George is also chair of Sernova, a company dedicated to curing diabetes.



Ronald H. McDonald (Chem '75) spent 20 years working at a pulp mill in Prince George, BC. After retiring in 1995, he formed his own consulting firm, Horizon Industrial Services Ltd.

1976

Joseph Debanne (MSci '76) published articles related to his doctoral research in Petroleum Transactions AIME 1969. This led to MIT's Energy Laboratory inviting him to be a visiting professor for the 1973-1974 academic year. He worked in the energy laboratory and the Department of Ocean Engineering, researching offshore oil and gas exploration and development.

1977



Paul Calamai (SD '77, '78, '83) is a professor in systems design engineering at Waterloo, never having left his alma mater.
paul.calamai@uwaterloo.ca



Mike McCartney (Chem '77) became a practising mechanical engineer by a "curious set of circumstances." Now semi-retired, he has his own company, M.E.

McCartney Engineering Ltd.
mike@comfortengineering.com

Jon Wagner (SD '77, MSci '79) recently published three books: *Building Effective Virtual and Remote Teams* (2011), *BEST Practices for Virtual Meetings* (2013), and *BEST Practices for the Virtual Classroom* (2014). He and his wife live on the shores of Lake Simcoe in Bayshore Village.
jonwagner@alumni.uwaterloo.ca

1978

Robert Cotterill (Civil '78) is now the CAO-city manager for the City of Spruce Grove, AB.

Ion Georgiadis (Civil '78) has been a construction project manager, a programmer, a software business owner and a hedge fund manager since completing his engineering degree. He retired in January 2011.

iongeorgiadis@gmail.com

Raymond Keith (Civil '78) is semi-retired and lives in Edmonton, AB. He continues to work on some industrial, civil and structural projects, and also volunteers at the YMCA.
rkeith7573@shaw.ca



Jim Keller (Elect '78) retired after 32 years working at the National Research Council of Canada. He now plans to concentrate on his own

military accoutrement business.
www.jgkeller.ca



H. Rudi Kroeker (Elect '78) completed 13 years on the board of trustees at Brock University, with three years spent as chair. He is the CEO of Whiting Heavy

Industries Inc., Whiting Equipment Canada Inc., Whiting Equipment Services Co. Ltd., Handling Specialty Manufacturing Ltd., Zhejiang NAMAG Equipment Manufacturing Co. Ltd., and is the director for Swenson Technology, Inc.



Ashok Kumar (Mech '78) is registered as a professional engineer in Alberta and a Diplomat of the American Academy of Environmental Engineers. He is a fellow member of A&WMA and was chair of its education council from 1998 to 2001.



Scott Lewis (Elect '78) spent 10 years growing his company, Northstar Technologies, which developed cutting-edge navigation equipment for boats and airplanes. In 2003,

Northstar was sold and Scott began work as a consultant. Last October, he took over the helm of a family-owned medical supply company.
www.alimed.com



Laird Paton (Civil '78) has worked around the world on construction projects, including the Muskrat Falls project.



Sandor Weinacht (Elect '78) retired from his position as SR&ED claims manager with Teledyne DALSA in June 2014, and now works part time as a consultant

for SR&ED tax credits, research funding and government relations.

sweinach@uwaterloo.ca

1979

CLASS REUNION - 35 YEARS SEPTEMBER 27-28, 2014

Eric Hortness (Civil '79) is happy to report he is retired.

Mike Kuntiya (Elect '79) says that after finishing his degree, he re-joined Malawi Railways, where he advanced to the position of chief engineer in the telecommunications and electrical department. From 2000-2010, he worked for the Malawi Communications Regulatory Authority as Director of Telecommunications. Since then, he has opened a consulting firm, FHG Investments, which covers ICT-related issues.

mkuntiya@africa-online.net



Sean O'Brien (Mech '79, '10) just celebrated 35 years with NCR. He lives in Waterloo with his wife.

Norm Sacher (Mech '79) retired two years ago, after

33 years in the pulp and paper industry. He is currently touring through the United States and Canada in his RV.



Selcuk Soyupak (Civil '79) is chairman of the civil engineering department at Karatay University in Konya, Turkey. He is still researching applications of artificial

intelligence methods in modelling and management of water resources systems.



Stephen L. Takomana (Mech '79) retired after working for Malawi Railways Limited, and, later, a motor dealer.

bensodza@gmail.com

1980

Allan Cooper (Mech '80) is in his 34th year with Imperial/ExxonMobil as a project engineer, including 25 years of overseas assignments in Terraganu, Malaysia, Kuala Lumpur, Tokyo, Doha, Paris and Houston. He is currently working on a LNG project in the United States.

al.k.cooper@exxonmobil.com

Ellen L. Lauersen (Chem '80) retired from Suncor Energy in 2008. She now spends her summers in Canmore, AB and winters in Maui.

Jennifer Marshall (Arch '80) and her partner, Shelley Craig, have been practising together since 2006 at Urban Arts Architecture, an award-winning architectural firm that specializes in community and institutional projects. Recently, Jennifer worked on UBC's Engineering Student Centre.



Tibor Schimek (Elect '80) has worked in North Carolina for the past three years, as a supervisor of electrical certification engineering at B/E Aerospace. His division

designs seating and lighting systems for commercial aircraft.

1981



Morgan Minor (Mech '81) lives in Niagara, where he grew up, after spending many years in the GTA. He spent the first third of his career in the

CAD/CAM/CAE field, and then moved into manufacturing and ERP. Morgan is now trying to make a living by trading on the stock market.

mdminor@sympatico.ca

1982

Edward Drennan (Chem '82) works in Brampton, ON as Regional General Manager at TRCC Canada, a chemical blending and contract manufacturing facility.

trcccanada.com



Peter Holmes (Chem '82, '86) retired at the end of 2012, after 26 years with Canada Post. Although he never worked in the chemical engineering field,

he is thankful for his Waterloo Engineering education. Peter lives in Ottawa.

pallanholmes@yahoo.ca

Mike Tonietto (Mech '82) started a new position as VP Manufacturing Engineering (Europe) with Fiat Chrysler Automobiles (FCA) and is now based in Torino, Italy. He is also the Global Head of Manufacturing Engineering for FCA.

1983

Graeme Consiglio (Civil '83) retired, but is still involved in several research projects in the fields of architecture and engineering, specifically the immense impact of their emerging technologies.



BUILDING BETTER CITIES

It's called the Big Move, and with good reason. The multi-billion-dollar transportation plan for Greater Toronto and Hamilton covers more than 80,000 square kilometres. It's designed to get six million people where they need to go today — and for the next quarter-century.

"You're trying to both shape the present and anticipate the future," says **Leslie Woo** (Arch '84), who heads up the colossal challenge as vice president of policy, planning and innovation at Metrolinx.

To do that, she needs buy-in from 10 transit operators, 30 municipalities and countless urban planners, developers and NGOs.

Woo's certainly up to the challenge. Having worked with environmental organizations, consulting firms and provincial and municipal governments, she comes to the table with a wealth of experience and a well-rounded perspective.

She also brings a passion for building community and bringing physical spaces to life. For Woo, transportation is all about people.

That's why she hopes her greatest legacy will be supporting new leaders, especially women, in a profession still dominated by men. "Right now, I'm less concerned about climbing a ladder," she says. "I'm more concerned about making sure there are lots of steps and rungs for others to follow in behind me."

As part of that effort, she launched the website *SheBuildsCities.org* in January 2013 to celebrate the achievements of her colleagues around the world and inspire girls to pursue careers in urban development. "Billions of women have an important role to play in building the cities of tomorrow," she says.

For proof, you don't need to look any further than Woo herself.

Steve McInnis (Chem '83, '85) retired in 2013. He works part time at the Habitat for Humanity Restore, participates in a growing project for the Canadian Foodgrains Bank and sits on the national committee of Presbyterian World Service and Development.

1984

CLASS REUNION – 30 YEARS SEPTEMBER 27-28, 2014

Marty Beelen (Chem '84) is hoping to retire soon. He has been married 25 years and has two children.

beeandg6176@hotmail.com

Paul Good (Civil '84) moved to Vancouver in 1992 and now lives with his wife and two children in Maple Ridge, BC. After working as a structural engineer for 25 years for various consultants in the building industry, he moved to the heavy industrial sector. Paul currently works for Tetra Tech's Oil and Gas division.

paulgood@telus.net

1985



Sung Choi (Mech '85) works at Armour Valve Ltd. in Toronto. The company supplies valve solutions to industries, power plants, oil sand projects and more.

1986



Todd McAlary (Geo '86) completed his master's in hydrogeology/geochemistry and his PhD in chemistry at the University of Waterloo. His doctoral research

included a comparison of several passive samplers for monitoring VOCs in and below occupied buildings and was sponsored by the U.S. Department of Defense. He is the practice leader for vapor intrusion services at Geosyntec Consultants, Inc. and teaches part time at the University of Toronto.

1987



Nick Colucci (Civil '87) was recently elected as the East Central Regional Councillor for Professional Engineers Ontario. He is employed by the Township of Brock as

the Director of Public Works.

landpeng@hotmail.ca

R. Gerry Day (Chem '87) has left the engineering profession and is now an optometrist.

Cameron Mahon (Elect '87) started a new job in September 2013, as the director of R&D for Northern Digital Inc., which supplies parts to other companies that make navigation equipment for use in the operating room and elsewhere.

cameronmahon@gmail.com

1988



Keith Finnie (Elect '88) retired in 2013, after 23 years working in information technology for the British Columbia Public Service. He and

his family live in Victoria BC.

keith.finnie@gmail.com



Lisa Rapoport (Arch '88), **Mary Tremain** (Arch '86) and **Chris Pommer** (Arch '88) of PLANT Architect Inc. received a 2014 National Urban Design

Award and a 2014 CSLA Award for the firm's Pottery Road Bicycle and Pedestrian Crossing project. The project has improved pedestrian and cyclist safety in Toronto.

studio@branchplant.com

Photography Credit: Photograph by Peter Legris. © PLANT Architect Inc.

Don Richardson (Civil '88) works in Burlington, ON, selling Myrtha commercial swimming pools across Canada. He enjoys spending time at his cottage and travelling with family.



Shayne Smith (Mech '88), recently moved to Pasadena, California, after transitioning from his role as CEO of Wardrop Engineering to join the corporate offices

of Tetra Tech, the company that acquired Wardrop in 2009. As VP, Government and International Relations, Shayne coordinates cross-company relationship and proposal development. He is also the chair of Engineers Without Borders Canada.

shayne.smith@tetratetech.com

1989

CLASS REUNION – 25 YEARS SEPTEMBER 27-28, 2014



Rafael Gomez-Moriana (Arch '89) recently gave a talk at an international meeting of architecture critics, held at London's Architectural Association. Rafael lives in Barcelona

and runs a term abroad program for the University of Calgary's architecture students. www.criticalista.com



Shaun McFarlane (Civil '89) is a business unit leader for Moffatt & Nichol's Alaska practice, leading its growing Anchorage office. A nine-year resident of Anchorage, Shaun delivers Port and

Harbor Engineering consulting services to clients across the Last Frontier.

smcfarlane@ak.net

1991

Rajiv Huria (Civil '91) moved to Indiana in March 2012. He is a partner and CEO of SJCA, PC.

rhuria@sjcassoc.com

Derek Schuurman (Elect '91, '94) worked for two small companies in Waterloo for nine years, before completing a PhD in electrical engineering at McMaster University. He is currently an associate professor of computer science and chair of the computer science and mathematics departments at Redeemer University College in Ancaster, ON.

1992



Alexandre Alves da Silva (Elect '92) reports that after 10 years as a professor at the Federal University of Rio de Janeiro, he began work at GE Global Research in Rio. He

leads the Smart Systems Centre of Excellence, a multi-disciplinary research and development centre that expands GE's capabilities and delivery of technology in oil and gas, renewable energy, mining, rail and aviation.



Belinda Elysee-Collen (Chem '92) started a new position as Account Manager, Food Ingredients with Dempsey Corporation, a family-owned business

distributing food ingredients across Canada and the United States. Belinda is also the president of the Canadian Institute of Food Science and Technology.

belinda@dempseycorporation.com



Michael Li (SD '92) is a managing partner at Tsing Capital, a leading venture-capital firm, focusing on cleantech related investment, including

environment protection, renewable energy, energy efficiency, new materials, sustainable agriculture, sustainable transportation and cleaner production. Michael is based in Shanghai, China.

michael@tsingcapital.com



Shaligram Pokharel (SD '92, '97) is a professor of mechanical and industrial engineering at Qatar University in Doha, Qatar. He conducts research in

emergency logistics, carbon supply chains, and energy conservation. He is also a global volunteer member of the Project Management Institute (PMI), USA, as a Chapter Member Advisory Group member. Shaligram has been a region mentor of PMI for four years.

1993



Jeff DiBattista (Civil '93), and his family just finished a year in Boston while Jeff completed an MBA in the

MIT Sloan Fellows Program in Innovation and Global Leadership. They are now at home in Edmonton, AB, where Jeff is a principal at DIALOG.

jdibattista@dialogdesign.ca



Mark Harnett (SD '93) is building on his Midnight Sun Solar Car experience as VP of marketing at Complete Solar Solution in the San Francisco Bay Area. He's been working

for various startups for the past 15 years in marketing and acquisition roles.

Will Kriski (Civil '93) went into IT in 2000 and he and his wife moved from Calgary to New Brunswick in 2010. He reports that he's mainly retired but occasionally works on contract projects and Internet projects such as teaching guitar online.

willkriski@outlook.com

1994

CLASS REUNION - 20 YEARS SEPTEMBER 27-28, 2014

Marcelo Alencar (Elect '94) was recently elected emeritus member of the Brazilian Telecommunications Society, an honour bestowed on only 12 people within four decades. This year, he will publish two books: *Information Theory and Set Theory*, *Measure and Probability*. He has written 15 books in his career, one of which is a best seller.

malencar@iecom.org.br

Arnold Chan (Mech '94) moved to California, and is working for GoPro as a senior program manager.



Jason Gregory (SD '94) is working as a lead programmer at Naughty Dog Inc., a wholly-owned subsidiary of Sony Computer Entertainment America.

Jason is also the author of the book *Game Engine Architecture*.

jagregory@gmail.com

Kori Miskuczka (Arch '94) is director of project management at exp Services Inc., responsible for overseeing multi-disciplinary building projects. He is principal-in-charge of the consultant team for the Union Station Train Shed Renewal project.

1995



David Allan (SD '95) is co-founder and president of Virtuix, a startup that manufactures virtual reality hardware.

david.allan@virtuix.com



Jim Murphy (Chem '95) founded Boltmade, Inc. in 2013, a custom software development company in Waterloo that focuses on the development of complex,

cloud-deployed web and mobile products.

jim@jimmurphy.com

David Zhang (Elect '95) is a professor at the Hong Kong Polytechnic University, where he is the founding director of the Biometrics Technology Centre (UGC/CRC). He is the author of more than 10 books and 200 journal papers.

1996

Jon Evans (Elect '96) has moved to the San Francisco Bay area, where he writes software for a company called HappyFunCorp, and also pens a weekly column for *TechCrunch*. Jon has published five novels and a graphic novel and is currently working on a book of travel writing.

www.rezendi.com

1998



Tony Caldarone (Elect '98) can be found at the Cove Motel and Restaurant, just outside Cape Breton, NS.

www.covemotel.com



Joy Henderson (Arch '98) recently returned from years spent in Spain and Mexico where she studied and worked as a practising architect and a technical translator of architectural documents.

She is putting her urbanism experience to use as operations manager at Cityzeen, a high-tech startup that's developing powerful software for big data.

Louis Houle (Mech '98) is the plant director for Bacardi in Jacksonville, Florida.

louis.houle7@gmail.com

Scott Sharabura (Chem '98) is working with McKinsey & Company as a strategy consultant in oil and gas. He lives just outside Calgary with his wife and three children.



Ian Stokes-Rees (Elect '98, '00) reports that after five years at Harvard and another 12 in academic research, he joined Continuum Analytics as a computational scientist.

1999

CLASS REUNION - 15 YEARS SEPTEMBER 27-28, 2014

2000



Jeremy Carkner (Civil '00) is a principal and department manager of the GTA Sustainability Group at Morrison Hershfield Limited. He and his family live in

Burlington, ON.



Kevin Chui (Elect '00) works as an electronic test operator at EPM Global Services Inc. He lives in Markham, ON.

kkcchui@hotmail.com



Mike Orr (Chem '00) worked in advertising for four years, then

co-founded a startup with colleagues.

Using a predictive semantic interest algorithm and a news-search index, their product helps to build stronger LinkedIn relationships by fostering valuable conversations.

www.grapevine6.com

Nikolai Petrov (Comp '00) develops software in the mortgage and financial industry.

2001



Catherine Coode (nee Phillips) (Elect '01) married fellow Waterloo Engineering student **David Coode** (Comp '00). Last year, Cat started her own business, Binary

Tattoo, helping people to safely define their digital identity.

cat@alumni.uwaterloo.ca

Christopher Heer (Comp '01) opened Heer Law in March 2014. The firm specializes in intellectual property law and litigation. Christopher is one of 25 lawyers designated by the Law Society of Upper Canada as a certified specialist in patent law.

cheer@heerlaw.com



Sushanta Mitra (Mech '01) is a professor in mechanical engineering and Assistant Vice-President (Research) at the University of Alberta. He is the Associate Scientific Director of IC-IMPACTS-NCE and Theme Leader on Water. He is also the director of Micro and Nano-scale Transport Lab and the team leader for Global Integrated Water Management Network and Nano-Bio-Energy Network. Sushanta was elected fellow of ASME, CSME and EIC for his contributions to the field.

2002



Wil Aballe (SD '02) owns Wil Aballe Art Projects (WAAP), an art gallery that holds exhibitions subverting typical modes of art presentation. Showcasing painting, photography, video and performance, WAAP was named by Blouin ArtInfo as one of the top emerging commercial galleries in Canada.

Philip Zoldak (Mech '02) completed his master's degree in mechanical engineering at the University Windsor. In 2012, Phil joined the Arizona-based startup Advanced Green Innovations (AGI) as a technical specialist - combustion R&D. He is currently pursuing industrial PhD studies in mechanical engineering at the University of Windsor. zoldak1@uwindsor.ca

2003

Dave Bendl (Mech '03) has been retired since 2009.

2004

**CLASS REUNION - 10 YEARS
SEPTEMBER 27-28, 2014**



Adam Hasham (Comp '04) is the founder of Hurrier, a company that is transforming local commerce by seamlessly connecting consumers, retailers and couriers.



David Lam (Comp '04) became a lawyer in intellectual property, corporate and real estate law. He currently runs his own firm and lives in Markham, ON. www.davidlam.ca

2005



Hisham Al-Shurafa (SD '05) won the W21C Health Innovation Award for his health startup, SnapDx. halshura@gmail.com



Zanoon Nissar (Elect '05) works at Google in the area of corporate social responsibility. zanoon@google.com



Kevin Quan (Elect '05, Comp '06) works at the Samsung Accelerator in New York City and participates in hackathons

during his spare time. His app, A Healthier Commute, suggests ways to alter your commute to improve your life.

Ron Spreeuwenberg (Chem '05) completed an MBA after graduating from Waterloo and worked in management consulting. He's now following his passion as a co-founder of software startup HiMama, which offers an easy way for communication between parents and childcare providers.

2006



Mahdi Asefi (Elect '06, '11) is a data scientist in the personalization group at Yahoo Inc. where he is developing a machine learning algorithm.

Arvind Chahal (SD '06) joined the startup Street Contxt in April 2014.



Ting Liu (MBET '06) works for a private real estate investment company in Toronto. She conducts market research and financial analysis for real estate

investment projects. tingliu2006@gmail.com



Elena L'Pris (Civil '06) works for SNC-Lavalin International in Abu Dhabi, representing Canadian engineers in the Middle East and acting as a focal point for all oil and gas proposals in the Middle East and Africa.

2007



Alex Cicuttini (Geo '07) works in Shell's projects division, and currently lives in Sherwood Park, AB.



Jonas Didzbalis (Enviro '07) founded a solar energy business in 2012, which installs residential and commercial solar energy systems in Southern California. jd@skssolar-usa.com



Reza Khanahmadi (Elect '07) is busy with research, testing and development of new quantitative and statistical analysis algorithms for U.S. equity and derivatives markets.

2008

Amy Adams (Geo '08) recently graduated with a PhD in geotechnical and geoenvironmental engineering from MIT. She will return to Ontario this fall to begin a position with Knight Piesold Ltd. amylynnadams@gmail.com

Amit Jethani (Mtron '08) recently completed his MBA at the Ivey Business School and now works as a product manager in the tech industry. ajethani@icloud.com

Glen Kurti (Mtron '08) started a non-profit organization called iCAN Play CANADA. It helps underprivileged children participate in local sports.



Wayne Miranda (Mtron '08) leads the Growth Mosaic team, based in Ghana, West Africa. The team sources, accelerates and matches social-impact businesses

with investors. So far, the team has helped over 12,500 Ghanaians. wayne@growthmosaic.com



Kaveh Mirsaedi (SD '08) worked in the energy industry for several years before starting to study dentistry at the University of Toronto.

Harout Manougian (Elect '08, '09) was elected as a trustee to the Toronto District School Board. He chairs the Operations and Facilities Management Committee and the 1:1 Learning Technology Committee.

Nell Rittenhouse (Mtron '08), who finished medical school this year, has started a family medicine residency in Goderich, ON.

Andrew Rizkalla (Mtron '08) spent five years in Hong Kong at a trading job with JP Morgan. He left the company recently and is looking forward to whatever comes next. arizkall@gmail.com

2009

CLASS REUNION – 5 YEARS
SEPTEMBER 27-28, 2014



Jennifer Cua (Comp '09) is an IT project manager for TELUS, responsible for the delivery of Data Centre solutions and services, and a managing partner for Pocket Aces

Partners, a micro-investment company that seeks business and investment opportunities.
jenn.cua@gmail.com

Jianzhong (Jason) Li (SD '09) is currently working on a number of music projects. His most recent project, *Time Escaped the Room*, uses different instruments and synth to represent the same melody, and is inspired by Andy Warhol's pop-art works.
lijz.bandcamp.com

Kela Weber (Enviro '04, Chem '06, '09) is the director of the Environmental Sciences Group, a research group focused on environmental problems related to contaminants. She is also an assistant professor in the chemistry and chemical engineering department at the Royal Military College of Canada.
kela.weber@rmc.ca

2010



Poroshat Damavandi-Asli (Enviro '10) is the managing coordinator of Eglinton Crosstown Light Rail Transit (The Crosstown), a \$5.3 billion Metrolinx

project in Toronto. In 2014, The Crosstown was ranked fifth in the category of Canada's largest infrastructure projects in ReNew Canada Infrastructure.



Aidin Kashigar (Elect '10) recently began a surgical residency in orthopaedic surgery at Queen's University.



Anson MacKeracher (Comp '10) works at Top Hat, a Waterloo startup. He held the vp technology role, and recently became chief architect for the company,

building the engineering team and helping design the technology behind Top Hat's flagship products.

anson@mackeracher.com

YangFeng (Cory) Qian (MSci '10) is a sales manager at Emerson Group, responsible for China's wind power market. She lives in Shanghai, China.

qianyangfeng@hotmail.com



Stephanie Simard (Civil '10) is a transportation planner for Dillon Consulting Limited in Toronto. She works on a range of projects from transit and fire master plans to

secondary land use plans.
ssimard@dillon.ca

2011



Alex Bolton (MSci '11) was appointed as hearing commissioner with the Alberta Energy Regulator, which ensures efficient, safe, orderly and environmentally-

responsible development of the province's energy resources.
alex.bolton@aer.ca



David Ensuncho (MBET '11) is the owner of a Print Three franchise in Oshawa. The company's main services are printing, web development, SEO, social media

development and marketing campaigns.
www.p3durham.com

Baker Humadi (Elect '11) co-founded the startup ExciteM, a self-serve platform that enables broadcast stations to create custom, interactive mobile and social experiences for their audiences in real-time.
baker@excitem.com



Roland Li (Elect '11) works as an engineer for Plexus Controls in Kanata, ON.



Fariborz Rahimi (Elect '11) finished a three-year post-doc at the London Health Sciences Centre. He is now an assistant professor at Bonab University in Iran.

2012

Hussein Attar (MSci '12) established two startups: Sawerly, a platform to book photographers in Saudi Arabia, and Mktaby, which supports the entrepreneurship ecosystem in Saudi Arabia.

hussein.attar@gmail.com

Alisha Deshpande (Chem '12) moved to Los Angeles to pursue a PhD at the University of Southern California. She researches improved process control and monitors methods for the oil and energy industry.



HER OWN PATH

When **Alison Scott** chose to pursue engineering, she didn't know what she was getting into.

"My dad was a metallurgical engineer, but I really had no idea what that meant," says Scott. "I just knew I wanted to choose my own path."

After discovering in Grade 11 that she enjoyed chemistry, one of her teachers suggested she look into chemical engineering.

"I thought it was totally different than what my dad did, so I decided to try it out," she says. "Eventually, though, I found out that we were basically doing the same thing, and I was loving it!"

Scott, who graduated with a BAsC in chemical engineering in 2013 and is now a master's student, is this year's winner of the prestigious Canadian Engineering Memorial Foundation Vale Master's in Engineering Scholarship. Its application process included producing a video about why she became an engineer. Now, as the recipient of the scholarship, Scott is required to share her story in at least two high school classrooms – something she's thrilled to do.

"It's important to me to act as a role model and mentor for younger girls and show them that anything is possible when you put your mind to it," says Scott, who coordinates the Girls Club for Waterloo's Engineering Science Quest outreach program.

The scholarship comes with a \$10,000 award and an internship with Vale, a global mining company, which has enabled her to look into ways her mining background and polymer interests can intersect.

"It's amazing how everything has come together, including my passion for engineering outreach and education," says Scott, whose graduate supervisor is Alex Penlidis, a chemical engineering professor.

The one person Scott doesn't need to encourage to become an engineer? Her brother Brian. As a fourth-year Waterloo mechanical engineering student, he's well on his way to becoming one.



GRADUATING WITH A DEGREE — AND A COMPANY

Dominic Toselli graduated in June with a mechanical engineering degree and numerous awards for PetroPredict, a startup that's garnering considerable investor attention.

The company he co-founded with Andrew Andrade, a second-year Waterloo mechatronics engineering student, uses data analytics to find potential oil and gas leaks that may go undetected for years.

In May, the company won a pair of top awards at the Ontario Centres of Excellence Discovery Conference, including the inaugural David McFadden Energy Entrepreneur Challenge and the Elevator Pitch competition. It has also captured several major awards from Velocity, the University of Waterloo's startup incubator.

PetroPredict is also one of the reasons Toselli was named this past spring as one of *Maclean's* Future Leaders under 25.

Toselli chose Waterloo Engineering for its co-op program and the opportunities it provides, especially in Silicon Valley where he spent a work term at Apple. While there, he developed a mechanism that helped reduce damage to an iPhone when it hits the ground. Toselli's invention so impressed Steve Zadesky, vice-president of iPod/iPhone, that a patent for it was recently published.

During a co-op term at Shell, he came up with a solution to a heat exchanger problem that resulted in the company saving \$1 million a year and the University of Waterloo honouring him as engineering's top co-op student for 2012. His work with Shell and Cenovus, another oil sands firm, provided him with the background to launch PetroPredict.

Besides working on his startup and his engineering degree, Toselli managed to find the time to found two clubs. An avid squash player, he launched the Waterloo Engineering squash club as well as the University of Waterloo Italian Club to encourage students to think about travelling abroad to complete a semester or a year.

How did he find the time to tick off so many items on his to-do list? Toselli has a simple answer: "I haven't slept a lot in the past year."



Ahmad R. Dhaini (Elect '12) is an NSERC postdoctoral fellow at Stanford University, working at the photonics and networking research lab in the electrical engineering

department. He researches emerging problems in optical access networks such as energy efficiency and optical-wireless integration.

ahmaddhaini@gmail.com

David Nguyen (Mtron '12) is active with the First Methodist Church and a competitive dance group.

Amandeep Singh (Elect '12) has been working on software applications, such as iOS apps, meant to benefit the environment. aman.1186@yahoo.com

2013



Alroy Almeida (Mtron '13) co-founded the startup Voltera with Jesus Zozaya and James Pickard. Their printer enables circuit boards to be prototyped within

minutes, eliminating the frustrations with traditional fabrication processes and drastically reducing hardware development time.

alroy@volterainc.com



Jeffrey Azzolin (Mech '13) founded a startup company called Bladetech Hockey Inc. that develops spring-loaded hockey skates to increase player performance and

reduce injuries. The company is currently prototyping and testing its product.

bladetechhockey.ca



Ehsan Ebrahimzadeh (Elect '13) is a PhD student in UCLA's electrical engineering department, researching data reconciliation. eebrahim@ucla.edu

Hyunsung Jung (Mech '13) is working for Nanowave Technologies as a quality engineer.



Alex Kranyak (Civil '13) works as a project engineer for Eastern Construction, and is currently assigned to a project at the University of Toronto.

IN MEMORIAM



Gordon Andrews (Mech '71)

James Belmore (Civil '74, '87)

Nico Benschop (Elect '71)

Robert Crawford (Chem '81)

Sherryl DiCiccio (MSci '86)

Zarko Draganic (SD '90)

Gordon Duncan (Mech '65)

Gloria Ellenton (Mech '78)

Zhihua Gu (Chem '81, '85)

Todd Harper (Comp '94)

Charles Harris (Mech '70)

David Honsberger (Elect '75)

Wes Lammers (Civil '64)

Raimond Mellikow (Mech '69)

Frank Meyer (Civil '72)

Earl Mogk (Mech '62)

Christopher Moran

(Arch - In Progress)

Rick Mosher (Civil '86)

Max Rao (Civil '95)

Christos Spanakos (Elect '68)

Alfred (Ted) Starr (Mech '74)

William Taylor (Elect '70, SD '72)

David Turcke (Civil '67, '75)

Klaus-Dieter (Nick) Van Vliet

(Mech '69)

Robert Wallace (Elect '68)

Barry Wills (SD '62, '63, '68)

UPCOMING EVENTS

50-YEAR REUNION FOR THE CLASS OF 1964

Dates: September 27 to 28, 2014

Time: Various, all day

Locations: University of Waterloo and Waterloo Inn

Feel like you're a student again by attending a lecture from the Back-to-the-Classroom series, the Dean's lecture or the Reunion Keynote lecture. Explore the campus by attending the Open House and joining one of the tours. Then, celebrate your 50th anniversary with a special 50th Iron Ring Ceremony (obligation renewal) sanctioned by the Iron Ring Wardens of Camp 15 Waterloo. The ceremony, which includes a special engraved Iron Ring, is followed by an Iron Ring Dinner at the Waterloo Inn. The next day, reunion festivities conclude with a brunch.

25-YEAR REUNION FOR THE CLASS OF 1989

Dates: September 27 to 28, 2014

Time: Various, all day

Locations: University of Waterloo and Waterloo Inn

Attend a lecture from the Back-to-the-Classroom lecture series, the Dean's lecture or the Reunion Keynote lecture. Explore the campus by attending the Open House and joining one of the tours. Then, celebrate your 25th anniversary with a special 25th Iron Ring Ceremony (obligation renewal) sanctioned by the Iron Ring Wardens of Camp 15 Waterloo, followed by an Iron Ring Dinner at the Waterloo Inn. The next day, reunion festivities conclude with a brunch.

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**.

REUNION FOR THE CLASSES OF 1969, 1974, 1979, 1984, 1989, 1994, 1999, 2004 AND 2009

Date: September 27 to 28, 2014

Time: Various, all day

Location: University of Waterloo

Not celebrating your milestone anniversary this year? You're still invited back to campus for your reunion. Attend a lecture from the Back-to-the-Classroom lecture series, the Dean's lecture or the Reunion Keynote lecture. Explore the campus by attending the Open House and one of the tours. Join your classmates at the Bomber for dinner and an after party. The next day, reunion festivities conclude with a brunch.

Register for reunion events at:

uwaterloo.ca/engineering/alumni/reunions

GO ENG GIRL

Date: Saturday, October 18, 2014

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

Location: Rod Coutts Engineering Lecture Hall, University of Waterloo

Go ENG Girl is a free annual event hosted by schools of engineering across Ontario for girls in Grades 7, 8, 9 and 10. The University of Waterloo event includes special guest speakers, an information fair, opportunities to meet current Waterloo Engineering women students, cool hands-on activities and a free lunch. To find out more, contact Rohini Wittke at: rwittke@uwaterloo.ca

2015 CLASS REUNIONS

Date: October 3 and 4, 2015

Time: Various, all day

Location: University of Waterloo and Waterloo Inn

The Classes of 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005 and 2010 are invited back to campus to celebrate your reunion. Mark your calendar!

GREETINGS ALUMNI

2015 marks the 25th anniversary of Waterloo's award-winning Engineering Science Quest program. If you're a past camper or ESQ leader, Martin Scherer, Engineering's outreach manager, would like to hear from you! Please email him at martin.scherer@uwaterloo.ca with any of your stories and/or photos to help celebrate ESQ's milestone.

As always, I'm looking for volunteers to become mentors for our students, reunion class representatives and guest speakers in our classrooms or to profile in publications. As well, if you know of a deserving classmate, please consider nominating that individual for one of our Alumni Achievement Medals.

If you're ever back on campus, please stop by my office to say hello — I'll be happy to treat you to a cup of coffee and show you around our newest buildings.

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



Sincerely,

GOSIA BRESTOVACKI | gosia.brestovacki@uwaterloo.ca

Senior Alumni Officer, Faculty of Engineering

HELPING RAISE THE COSTA CONCORDIA

As any six-year-old will tell you, firing lasers beams is cool. But firing them underwater to map ice caves in Antarctica, locate shipwrecks in the Northwest Passage, help raise the Costa Concordia and set a new inspection standard for the oil and gas industry? That takes cool to a whole new level.

“We’re doing stuff that nobody else has ever done,” says Jason Gillham, a mechanical engineering BAsC and MASc graduate.

As a master’s student, Gillham developed a scanner that aims a laser beam at underwater objects and then measures how that beam bounces back. Add trigonometry to the data and you’ve got a 3D digital model of your object.

Unlike video scanning, Gillham’s scanner can capture exact measurements, while providing far better resolution than sonar offers. As a result, the world has started noticing Waterloo-based 2G Robotics, the company Gillham founded in 2007 to commercialize his device.

At first, he recalls, selling the scanners was tough work. While the technology intrigued prospective customers, few were willing to take a gamble on something new.

Then came the Costa Concordia. Raising the shipwrecked cruise liner in 2013 involved attaching giant “water wings” to either side of the vessel. To do that, engineers needed detailed images of the submerged starboard side. 2G Robotics delivered those images — and gained international media attention in the process.

“It’s one of those rare opportunities you get in a lifetime,” says Gillham.

2G Robotics has also demonstrated its capabilities to the oil and gas industry in the Gulf of Mexico. By attaching its laser scanner to an autonomous underwater vehicle that surveys pipelines three kilometres below the ocean surface, 2G Robotics proved it could detect damage and corrosion, as well as seabed erosion that leaves pipelines unsupported.

As a result, laser scanning has become the new standard for subsea pipeline inspection. To keep up with demand, 2G Robotics recently opened an office in Aberdeen, Scotland, an industry hub for North Sea oil and gas exploration.

Gillham plans to expand his company’s global reach even further and seize new opportunities that continue to emerge. “Every time I turn around, there’s a new idea that people have had in terms of how they might be able to use our technology,” he says. “It’s an amazing business to be in.”

Jason Gillham, BAsC ’07, MASc ’11, Mechanical



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