

Computers imitate life: Kamran Behdinan, Chair, Department of Aerospace Engineering uses computer models to investigate real-world experiences, from sports injuries to the effect of G-forces on the heart to the durability of truck door hinges. Inset: a computer model simulates a baseball hitting the front teeth. For the full story, visit ryerson.ca/ors/showcase

FOCUS ON NEW FACULTY

Beyond science fiction

Bringing wearable computers to the mainstream

Who hasn't stared at a computer screen? Background photos may temporarily break the visual monotony, but the fact remains, no matter what computer you use, the familiar layout of files, folders, icons and recycle bins are sure to follow.

The use of symbolic desktop items, widely recognized as representations of the modern-day office, has contributed to the user-friendliness of PCs and, ultimately, their popularity. But the interface that has done wonders in our homes and workplaces might stunt the next generation of computers—the ones you wear.

"Nobody straps a desk to his or her head before going out," says Isabel Pedersen, who recently joined Ryerson's Department of Business and Technical Communication. "By failing to separate the desktop design from our concept of a computer, we are limiting our

ability to develop technology that goes beyond anything previously imagined."

Wearable computers (WCs), for those who mistakenly think of cyborgs, are wireless, portable machines similar to a laptop. Unlike notebook computers, however, WCs are much smaller, are worn like eyeglasses and provide information that enhances our reality. And if you find that notion a little strange, recall a time when even the Internet and CD-ROMs were considered revolutionary.

WCs, like the technologies that preceded them, can bring possibilities to life. For example, musicians could use their computers anywhere and anytime to compose songs or collaborate, online and in silence, with other artists with WCs across the country. Or, the ocean floor could be virtually explored through devices that show scenes of marine life and simulate swimming motions.

The concepts may be wondrous, but they're also difficult for the average person to grasp. Many of us don't understand how the current design of WCs work or how we might benefit from them. As a result, the technology, with all its potential for greatness among everyday people, is going nowhere fast.

"People ask me 'how could I check my e-mail on a WC?' I tell them to leave e-mail to their desktop computer. Use your WC to do and see things you've never thought of before. To achieve that, however, the WC interface, like the one for PCs, must fit human needs."

The solution, she says, lies in the humanities. Rather than asking people to adapt to the new technology, WCs must be designed to meet principles of effective communication. That means developing a familiar and easy-to-use interface that conforms to how we make sense of our world and persuades us to use the technology. The result, Dr. Pedersen believes, could be groundbreaking. "We've only been designing for what we have done in the past, rather than designing for all that could be done in the future." Dana Yates



Isabel Pedersen:
big ideas for small
computers

One cell, many questions

How do those hardy micro-organisms survive?

They're *everywhere* — on the kitchen counter, in water distribution systems and under our nails.

Micro-organisms, the Earth's first life form, are invisible to the human eye. While most of these one-celled entities are harmless and even beneficial to us, some of them can be quite destructive.

Enter Gideon Wolfaardt from Ryerson's Department of Chemistry and Biology. Recently arrived from South Africa's Stellenbosch University, Dr. Wolfaardt got his first taste of Canadian research during the 1990s while working on a PhD at the University of Saskatchewan. Now, as a Tier II Canada Research Chair in Environmental Interfaces and Biofilms he studies the natural habitat of micro-organisms.

When microbes join together, they form a biofilm, a coating that adheres to various surfaces. To some, those microbe populations are just "a layer of goo," but to Dr. Wolfaardt, they are worth studying because they profoundly impact our lives.

Biofilms can be found, among other places, in drinking and purified water systems, and in the cosmetic, pharmaceutical, medical and electronics industries, where they often interfere with products and processes. The results are products of inferior quality, costly equipment repairs and even system failure. But not all biofilms are bad — they can also serve a useful function in certain environmental and engineered systems, such as water treatment plants.

Not enough is known about these miniature communities, however, and Dr. Wolfaardt aims to change that. "Microbes modify their behaviour once they join a protective biofilm. But we need to learn more about these micro-organisms from a physical, biological and chemical standpoint, how they interact and what they do to survive.

"It's amazing these tiny living things can create such well-organized systems that keep us wondering all the time. Just when we think we've figured them out, they change."

As a result, there is a lot at stake in Dr. Wolfaardt's research. If he can nail down how biofilms operate in the environment, it might explain how infection-causing microbes survive

and function inside us — a breakthrough for modern medicine. "When microbes are free-floating, they can be reached by antibiotics. However, when they gather on the surfaces of medical implants (such as a ventilator), microbes become extremely difficult to treat. That's because microbes in a biofilm co-operate in ways that require less energy, enhance their reproductive success and facilitate heightened microbial resistance."

Micro-organisms that are impervious to chemical agents are a significant concern. When subjected to successive and unsuccessful rounds of antibiotics, microbes can become drug-resistant and, essentially, unstoppable. The same phenomenon occurs in industrial, and potentially in drinking water, systems, where micro-organisms develop increased resistance to chemicals.

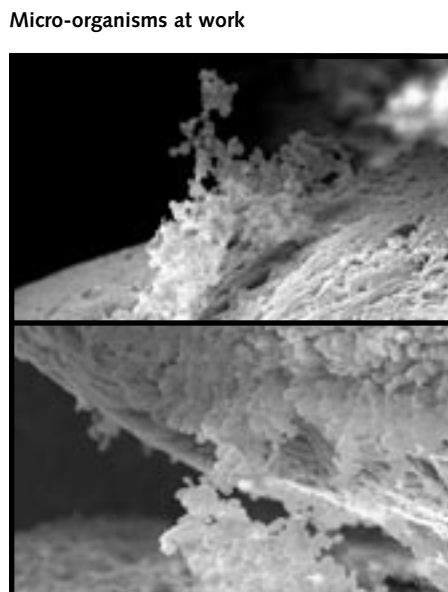
Microbes have the ingenious ability to develop resistance to chemicals, and to transfer genes that enable other micro-organisms to become resistant. Subsequently, harmless, and often beneficial, microbes can be altered and



Gideon Wolfaardt: controlling the microbe masses

thereby contribute to the problem. It's a frightening concept, and one that Dr. Wolfaardt may prevent from happening. His research, which is also funded by the Canada Foundation for Innovation (CFI) and the Natural Sciences and Engineering Research Council of Canada, might ultimately lead to the development of new-and-improved approaches to control the activity of microbes in industrial and clinical settings.

Achieving that objective will be made easier thanks to Ryerson's advanced microscopy and analytical facilities, which house state-of-the-art research tools and modern equipment in Dr. Wolfaardt's new laboratory that were obtained with support from the University, CFI, and matching funds from the Ontario Innovation Trust. These will help Dr. Wolfaardt and his research team solve the mystery of biofilms. "It had always been my goal to work in a facility like this," he says. "Many university research groups in microbiology would love to have access to the imaging and analytical technology available here." Dana Yates with files from Heather Finley





Forefront

by Dr. Judith Sandys

Associate Vice President Academic (Research and International Development)

University research engine for innovation

In their never-ending pursuit of knowledge, universities are critical to the success of our nation. According to the Association of Universities and Colleges of Canada, universities conducted more than \$7.8 billion worth of research and development last year. At Ryerson, too, research – and other forms of scholarly, research and creative (SRC) activity – continues to grow each year. Strategic investments in faculty recruitment, support and infrastructure, all have contributed to exciting SRC developments across the University. We take pride in these accomplishments and hope that you enjoy reading about some of them in this edition of *Impact*.

Some research initiatives that Ryerson faculty undertake has the potential to lead to important economic benefits. As Canada and Ontario focus their energies on promoting innovation and economic prosperity, we find ourselves in a climate where funding for such research is likely to increase. We want and expect Ryerson faculty to compete even more successfully for funding, and to play a part in promoting economic growth through research that reflects innovative thinking.

At the same time, we recognize that the value of university-based

research extends far beyond any direct economic benefit. From a qualitative perspective, research has an enormous impact on our lives, helping us explore our communities, improve public policy and foster understanding of the world. Studies that develop knowledge which contributes, for example, to better health care, better access to jobs or education, a decrease in crime or increased civic participation, will invariably create economic benefits, even if these are not quite as obvious as the development and commercialization of a new technology.

Other kinds of research and SRC play an essential role in maintaining and enhancing the cultural life of our communities, creating environments that attract innovative people in all fields of endeavour and contributing to our overall quality of life. All told, university-based research sparks inspiration—telling us where we are, helping us envision where we can go and showing us how to get there.

It is true that funding for research is subject to changing political priorities. At any given time, we need to take advantage of the current funding climate and play our part in contributing to the accomplishment of these defined priorities. Meanwhile, we need to continue to promote a broader appreciation of the value of all kinds of research. Canada's development and continued success depends on it.

IN BRIEF

Ontario technology transfer offices link up

Ryerson has joined forces with technology transfer offices from academic research centres across Ontario to promote the commercialization of research. The newly formed Ontario Society for Excellence in Technology Transfer (OnSETT), which represents universities, research hospitals and other institutions, aims to, among many things, strengthen commercialization networks and encourage best practices in technology transfer. The future of the province's economy and Ontarians' quality of life depends on the knowledge sector. Converting research into practical applications for the marketplace develops new products and medical treatments, and leads to improvements in manufacturing, which thereby helps Canada compete on the world stage. "OnSETT provides an opportunity to enhance the flow of technology and innovation from academic institutions like Ryerson into the community," says Heather Gallant, Treasurer of OnSETT and Co-ordinator for Business Development, Contracts and Technology Transfer at Ryerson. "We can be more effective by working together with the Ontario-wide commercialization community." In the coming year, OnSETT plans to connect with other regional technology transfer organizations to establish a Canada-wide network.

FUNDING SUPPORT FOR RESEARCHERS PROFILED IN THIS ISSUE

Associated researchers in italics

- Auto 21 – Automobile of the 21st Century – Networks of Centres of Excellence (*Behdinan*)
- Bloorview MacMillan Children's Centre Foundation (*Behdinan*)
- Canada Research Chair Program (CRC) (*Gammel, Kolios, Wolfaardt*)
- Canada Foundation for Innovation (CFI) (*Gammel, Kolios, Wolfaardt*)
- Canadian Institutes of Health Research (CIHR) (*Lum*)
- Defence Research and Development Canada (*Behdinan*)
- Foseco-Morval (*Ravindran/Bichler*)
- Geomatics for Informed Decisions (GEOIDE) – Networks of Centres of Excellence (*Yeates/Farber*)
- Human Resources Development Canada (HRDC) (*Ali*)
- Joint Centre of Excellence for Research on Immigration and Settlement (CERIS) (*Ali*)
- Materials and Manufacturing Ontario (MMO) (*Behdinan, Ravindran/Bichler*)
- Municipal Property Assessment Corporation of Ontario (MPAC) (*Farber/Yeates*)
- Natural Sciences and Engineering Research Council of Canada (NSERC) (*Behdinan, Kolios, Ravindran/Bichler, Wolfaardt*)
- Ontario Innovation Trust (OIT) (*Kolios, Wolfaardt*)
- Ontario Regional Office of Settlement Services of Citizenship and Immigration Canada (*Ali*)
- Ontario Research Fund (*Gammel, Kolios*)
- Pratt & Whitney Canada Inc. (*Behdinan*)
- Premier's Research Excellence Awards (PREA) (*Kolios*)
- Social Sciences and Humanities Research Council of Canada (SSHRC) (*Lum, Berger*)
- The Whitaker Foundation (*Kolios*)
- United Way of Greater Toronto (*Lum*)

Latest chairholders announced



Irene Gammel

The Canada Research Chair (CRC) program – a national strategy to boost Canada's research and development capacity – is helping Ryerson become a leading-edge centre of research.

Since 2000, the CRC program has established research professorships in universities across the country – with eight such professorships allotted to Ryerson. Our first three CRCs are: Mohamed Lachemi, CRC in Sustainable Construction; Ling Guan, CRC in Multimedia and Computer Technology; and Gideon Wolfaardt, CRC in Environmental Interfaces and Biofilms (*see page one*).

The latest investment in the CRC program was announced in November. "We're proud that (this) funding will support research by Canada's leading scholarly and scientific minds," said Prime Minister Paul Martin. "From health care to the environment to building stronger communities, the work of these Canada Research Chairs will have a direct impact on the lives of Canadians and help position Canada as a world leader in the 21st century economy."

Ryerson's newest CRC recipients are Irene Gammel, (from the University of Prince Edward Island), CRC in Modern Literature and Culture, and Michael Kolios (Department of Mathematics, Physics & Computer Science - MPCS), CRC in Biomedical Applications of Ultrasound.

Dr. Gammel's appointment to a Tier I CRC position is an acknowledgment by her peers that she is a pioneer and world leader in her field. The

designation is also accompanied by a Canada Foundation for Innovation (CFI) grant for the establishment of a Modern Culture Multimedia Centre at Ryerson.

A specialist in literature and culture, Dr. Gammel is the author of seven influential books including *Baroness Elsa: Gender, Dada, and Everyday Modernity - A Cultural Biography*, published by MIT Press to considerable acclaim in the scholarly and the popular press, including the *New York Times*, *Bookforum*, *Literary Review*, *Art in America*, *Elle*, *Berliner Zeitung*, *Die Zeit* and many others. Dr. Gammel's most recent books include a collection of essays, *The Intimate Life of L. M. Montgomery* (University of Toronto Press, spring 2005) and *A Dozen Cocktails Please: The Poetry of Elsa von Freytag-Loringhoven* (Berlin: Ebersbach, spring 2005). She has also held continuous funding through the Social Sciences and Humanities Research Council of Canada.

"I am very excited to be joining Ryerson," says Dr. Gammel. "My research on gender, literature and avant-garde cultures is a strong fit with the University's interdisciplinary mandate."

In January, Dr. Gammel will join the Department of English, where she will participate in the undergraduate Arts and Contemporary Studies program and the graduate program in Communication and Culture. Her proposed research centres on *The Female Modern: Between Avant-garde and Popular Culture* and will bring

to Ryerson a proven ability to provide scholarly leadership in disciplines ranging from literature, culture and fashion to performance art.

In another branch of knowledge, Dr. Kolios's research in ultrasound imaging has attracted more than \$1 million from granting agencies in his six years at Ryerson. A Tier II CRC with CFI funding, Dr. Kolios is an exceptional emerging researcher whose work has the potential to lead to major health care advances on at least two fronts—cancer treatment and organ transplants.

"My research is the result of a discovery made by Gregory Czarnota (a Princess Margaret Hospital—PMH—radiation oncologist and Adjunct Professor, MPCS) and myself in 1996 while we were still graduate students at the University of Toronto," Dr. Kolios says. "We found that high-frequency ultrasound could image the self-destruction of cells."

That breakthrough led to Dr. Kolios's collaboration with researchers at PMH. That network will expand in 2005 when long-time collaborator Dr. Czarnota joins Sunnybrook and Women's College Health Sciences Centre. They are working to develop what would be the first non-invasive technique to monitor cell death in the body. This diagnostic advancement would make it possible for an oncologist to know within days, rather than months, whether a prescribed course of chemotherapy and/or radiation is successfully shrinking a patient's cancerous growth.

Dr. Kolios is also conducting research in high-intensity-focused ultrasound that may lead to ultrasound therapies for diseases ranging from skin warts to cancer. The therapy

would eliminate the need for surgery by burning away diseased cells without damaging surrounding healthy tissue.

In addition, Dr. Kolios's team is investigating how to use ultrasound imaging to increase the odds of successful organ transplantation. It's a project for which he received a grant in 2002 from the prestigious U.S.-based Whitaker Foundation. He and his colleagues are working on a technique to determine how much cell death has occurred in an organ temporarily stored before surgery. That knowledge would help doctors assess the organ's viability. *Ron Levy with files from Heather Finley*

impact

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Where charity begins

Studying how to engage ethnic communities in voluntarism, philanthropy

With an increased need for its services and decreased funding from the government for its organizations, the voluntary sector is turning to ethnic communities, which have previously been left untapped, to find new volunteers and financial support.

Ida Berger, Associate Director, Faculty Affairs and Professor of Marketing in Ryerson's School of Business Management, hopes her study, funded by the Social Sciences and Humanities Research Council of Canada, will provide voluntary organizations with information on how to better recruit and maintain members of these communities, and engage their support. "Our goal is to first describe differences in volunteering by ethnic group," says Dr. Berger. "In other words, how much and how do different ethnic groups volunteer? And then we want to understand why there are differences."

Dr. Berger has focused her study on the Chinese and South Asian communities in Toronto, ethnic groups that have been identified by the National Survey of Giving, Volunteering and Participating (NSGVP) as volunteering less than other population groups. Dr. Berger is working with Ryerson colleagues Drs. Mary Foster and Agnes Meinhard, Director of Ryerson's Centre for Voluntary Sector Studies.

There are a number of reasons for the low rate of volunteerism in the Chinese and South Asian communities, Dr. Berger says, and an important one is simply that "they don't get

asked. It's not that they're less inclined to give, it's that they're kind of invisible to the voluntary sector."

The Canadian Cancer Society is particularly interested in the results of the study. It has seen a decline in the number of its volunteers that concerns administrators. "We couldn't survive without our volunteers," says Fran Walsh, the Regional Director (Toronto) of the Canadian Cancer Society.

Ms. Walsh says the Society has been attempting to reach out to various ethnic groups, including the Chinese and Tamil communities. The Ryerson study would help Ms. Walsh know if she's on the right track and potentially provide new ideas on how to engage Toronto's diverse population.

Ryerson offers a great location – in the heart of a multicultural city – and indispensable resources that make it an ideal base for the study, Dr. Berger says. The University provides essential access to data from the NSGVP through the Toronto Region Statistics Canada's Research Data Centre (RDC), a joint undertaking among Ryerson, York University, the University of Toronto and Statistics Canada. "We wouldn't be able to do the work we're doing if we didn't have access to the RDC," says Dr. Berger.

CERIS, (the Centre of Excellence for Research on Immigration and Settlement), another joint Ryerson, York and U of T project, and CSCA (Ryerson's Centre for the Study of Commercial Activity) are also impor-

tant resources for the study. The latter provides geographic coding and analysis, enabling Dr. Berger and her partners to map ethnicity and volunteering against geographical parameters.

Although the study will continue until next summer, preliminary results show that religion is an important factor in determining the level of volunteering and philanthropic giving. "Religious differences can explain a large part of ethnic differences seen in volunteering and giving," says Dr. Berger. The results also indicate the need to develop specific recruiting and management methods to target people within a community who are most likely to volunteer.

Prof. Berger says the challenges of engaging a diverse population are the same for every organization – voluntary or corporate. She hopes the study will help those organizations reach out to people who, due to different ethnic backgrounds, have different attitudes and social norms. "I really believe that managing a diverse population is the challenge of this century," says Prof. Berger, "particularly in Canada and particularly in Toronto." Shannon Klie

Ida Berger



Dario Ruberto

"I really believe that managing a diverse population is the challenge of this century."



Mehrunnisa Ali

Dario Ruberto

Helping immigrants and their children thrive in Canada.



Good parenting

Resources assist newcomers with young children

All parents of young children face challenges. But what kinds of challenges are specific to immigrant parents? What services are available to them? What barriers do they encounter in using these services? And, what kind of future will their children have in Canada?

These questions prompted Professor Mehrunnisa Ali from the School of Early Childhood Education, and colleague Professor Emerita Kenise Murphy Kilbride, to embark on a three-year, Human Resources Development Canada-sponsored project to study the challenges encountered by newcomer parents of children under eight years old.

"We found in our earlier work there was a lot of research focusing on older immigrant children and their parents, but there was almost nothing for younger children," Dr. Ali says.

The research team interviewed parents living in Toronto, Montreal and Vancouver, whose first language was Amharic, Arabic, Dari, Mandarin, Somali, Twi or Urdu. The study investigated not only the parents' perception of their challenges, but also the perception of service providers, including teachers, childcare providers, doctors, nurses and other front-line professionals.

When asked what had the greatest impact on their ability to be good parents, the majority of newcomers identified unemployment (or underemployment) as the single most important factor. Among the reasons for their unemployment, they listed non-recognition of their credentials, racial discrimination as well as lack of

Canadian work experience and affordable childcare.

Interestingly, the responses of the service providers were somewhat different. They believed that financial and legal status, along with competency in English or French, were the primary factors in determining newcomers' ability to successfully fulfil their roles as parents of young children in a new country.

Dr. Ali believes newcomers' reduced capacity for parenting will have long-term implications. "It's not just this particular generation of newcomers to whom we are doing a disservice. We're also doing a disservice to ourselves as Canadians because, first of all, we are not using the enormous resources they bring to us. Second, and most importantly, we are doing a huge disservice to the children of these immigrants."

Based on their findings, Drs. Ali and Kilbride created a series of resource materials designed to assist newcomers and help service providers be more sensitive to their clients' needs. They produced a 43-minute English video that was translated into eight languages – the seven languages of the study and French. The videos were made available to families through family resource programs, community centres and various settlement services.

"We conducted workshops not only in the three cities where we collected data, but also in Hamilton, Edmonton, Ottawa and Calgary. We organized workshops for both the service providers and the parents."

The feedback she received about the videos and workshops has been

positive. "We've received letters from people all over Canada asking for these materials," says Dr. Ali, whose team has also developed a handbook, which is currently being translated, and is working on a website.

The videos were so well received that there have been requests to make them available at consulates and embassies so parents can view them before they arrive in Canada. In addition, Dr. Kilbride has received word that the Ontario Regional Office of Settlement Services of Citizenship and Immigration Canada will fund translation of the video and handbook into six other languages. The department has also expressed an interest in funding the production and distribution of these materials in their programs. Julie Zahab

Reality television: video eases immigrant parents' transition to their new home.



Home sweet home

Helping seniors live independently

Many seniors, who would prefer to live independently in their own homes, are being pressured to enter nursing homes or long-term care facilities.

These are not people who need a lot of complicated supports and services. Rather, they require some degree of assistance with personal care, house-keeping or meal preparation, but “are otherwise fundamentally capable of living an independent life. They end up going into a nursing home essentially by default. It’s often a no-choice scenario for them and it’s very troubling,” says Janet Lum, Associate Professor in Ryerson’s Department of Politics and Public Administration.

“It’s much better for the individuals involved and also more cost-effective for the health care system to give people the choice between staying in their own homes with some support or being institutionalized,” she says.

Dr. Lum is Principal Investigator (Academic) of a research project entitled, *When Home Is Community: A Comparative Study of Seniors in Supportive and Unsupported Housing in Toronto*. Funded by a grant from

the United Way of Greater Toronto, in partnership with Neighbourhood Link/Senior Link, with contributing funds from other resources, the project involves community and academic research partners. It is one of several research projects through which Dr. Lum is investigating Canada’s health system and the increasing demands made on it.

“We want this research to highlight the essential role that the non-profit community service sector plays in promoting the health and well-being of all Canadians, but especially seniors and people with disabilities,” she says.

Her research seeks to demonstrate how effective community support services can help seniors live independently in their own homes, remain socially connected and maintain a high level of physical and mental health. The research also aims to make policy recommendations about supportive housing or assisted living as a cost-effective alternative to nursing homes and other long-term care facilities.

“When case managers can co-ordinate a wide range of services for

seniors in supportive housing they can also anticipate, and even forestall, potential crises,” says Dr. Lum. As a result, she says, those seniors are less likely than those without case managers to phone 911 or end up in the emergency room, particularly at night. “Our research is trying to point the way to better solutions for individuals and for the system.”

The “no-choice nursing home scenario” is sometimes due to a lack of awareness among seniors and/or their families of alternative programs, Dr. Lum says. But it also results from insufficient public funds to the community sector, which is often viewed as being separate from the formal health system that includes doctors and hospitals. For example, Dr. Lum says the recent health deal between Ottawa and the provinces made little mention of community agencies even though they play a critical role in sustaining health.

“Over the last decade, base funding for community service agencies has remained flat. Health system restructuring, which has resulted in more day surgeries, fewer hospital beds and



Dario Ruberto

Janet Lum:
enabling the elderly to stay in their homes

quicker hospital discharges, exacerbates this problem,” says Dr. Lum.

“Now, more people are competing for the same services and the community service sector is being squeezed. So, even if seniors want to age at home, they may not be able to. That’s because community agencies are too busy meeting the needs of people who have just left the hospital and require urgent post-acute care. Without better support, seniors may be pushed into long-term care beds.

“The ultimate goal is to give people more choice, particularly in their housing options. Affordable housing, with health and social support provided through community service agencies, means that seniors can stay in their community and remain independent for as long as they wish.” *Dennis Mellersh with files from Journalism student Jennifer Forhan*



Plain speaking | Grad students explain research in lay terms

Each year the University sponsors a research article competition for Ryerson graduate students. The aim is to encourage them to make their research accessible to a broad audience and to demonstrate to Canadians the

value of the investment made in university-based research. This year’s first place winners were Steven Farber, a MA student in Spatial Analysis (social sciences and humanities category), and Lukas Bichler, a MASc student in

Mechanical Engineering (sciences category). Both essays are excerpted here. The full articles, as well as other award-winning articles can be viewed at ryerson.ca/ors. The competition is supported by the Natural Sciences and

Engineering Research Council of Canada (NSERC) SPARK program, the Ryerson NSERC Representative as well as the School of Graduate Studies, the Office of Public Affairs and the Office of Research Services.

Property assessment goes high-tech

How GIS can improve existing methodologies



for 55 per cent of all municipal funding in Canada. That is why property values must be assessed as accurately and equitably as possible.

A recent boom in the so-called geotechnology industry has led to the development of sophisticated geostatistical methods that incorporate geography into the property value estimation procedure. My research goal is to demonstrate that the incorporation of Geographic Information Systems (GIS) into property assessment will lead to quicker, cheaper, more accurate and more equitable estimates.

Traditionally, residential property values have been estimated with hedonic price models. Although this

name sounds quite intriguing, I assure you that property assessment has very little to do with wild toga parties. Rather, these models assume that the market value of a house is related to the perceived “pleasure” associated with its characteristics. In other words, a home is worth much more than simply the sum of its building materials.

The structural attributes of a property — like the size of its living area, the number of bathrooms it has, or the age of its construction — only constitute one of the three groups of variables that are used in hedonic modeling. The other two groups, accessibility and neighbourhood type, are related to a property’s location. Accessibility variables measure a house’s proximity to important features in the urban fabric such as the downtown core or shopping centres, and neighbourhood variables quantify the socio-economic mix of a local area. Property values are then determined using statistical models that compare each house to houses with similar characteristics that were recently sold in the free market.

In the past, accumulating data about accessibility and neighbourhood type was a computationally difficult task, and property assessors could not incorporate them into their models. But with the use of GIS and publicly available data-sources, locational variables can now be computed for every single house in a city. *Steven Farber*

Magnesium alloys = clean air + more ‘moolah’ in your pocket!?

Degenerated ecosystems, global warming and environmental pollution are predicaments our planet Earth can no longer endure.

European, U.S. and Canadian governments, among others, are beginning to take action to reverse the devastating effect humans have on air-quality and land pollution. For example, introduction of new laws and regulations demand the automotive industry reduce vehicular emissions. These initiatives spurred the development of new powertrain technologies, such as the hydrogen fuel cell. Unfortunately, the use of these fuel cells in everyday life is not economically feasible at this point. However, there is a second stream of initiatives focused on the development of new ultra-light materials. Strong, light, recyclable and environmentally friendly materials allow for more efficient operation of vehicles.

Reduction of vehicular weight and the development of new ultra-light alloys for the automotive and aerospace industries are currently some of the “hottest” research

areas in North America and Europe. Light alloys replaced the iron-based alloys in the last decade. Nonetheless, recent and increasingly stringent requirements on vehicle exhaust emissions necessitate further reduction of vehicular weight. If successful, the replacement of already light and popular aluminium alloys by even lighter, yet equally strong and economically attractive materials, will be a major breakthrough for the aircraft and auto industries. There are exotic titanium and lithium alloys, which have desirable properties. However, the costs associated with manufacture of such materials deem them impractical for many large-scale applications.

Fortunately, alloys exist which are lighter than aluminium, as strong as steel and are readily available for a very reasonable cost. They are the magnesium-based alloys. Magnesium is the lightest structural metal with strength, toughness and corrosion resistance comparable to any general-purpose metal currently used by the auto industry. *Lukas Bichler*