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THE IRON WARRIOR

THE NEWSPAPER OF THE UNIVERSITY OF WATERLOO ENGINEERING SOCIETY

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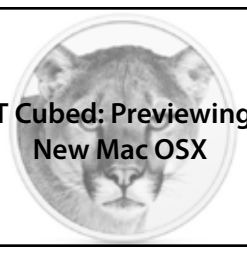

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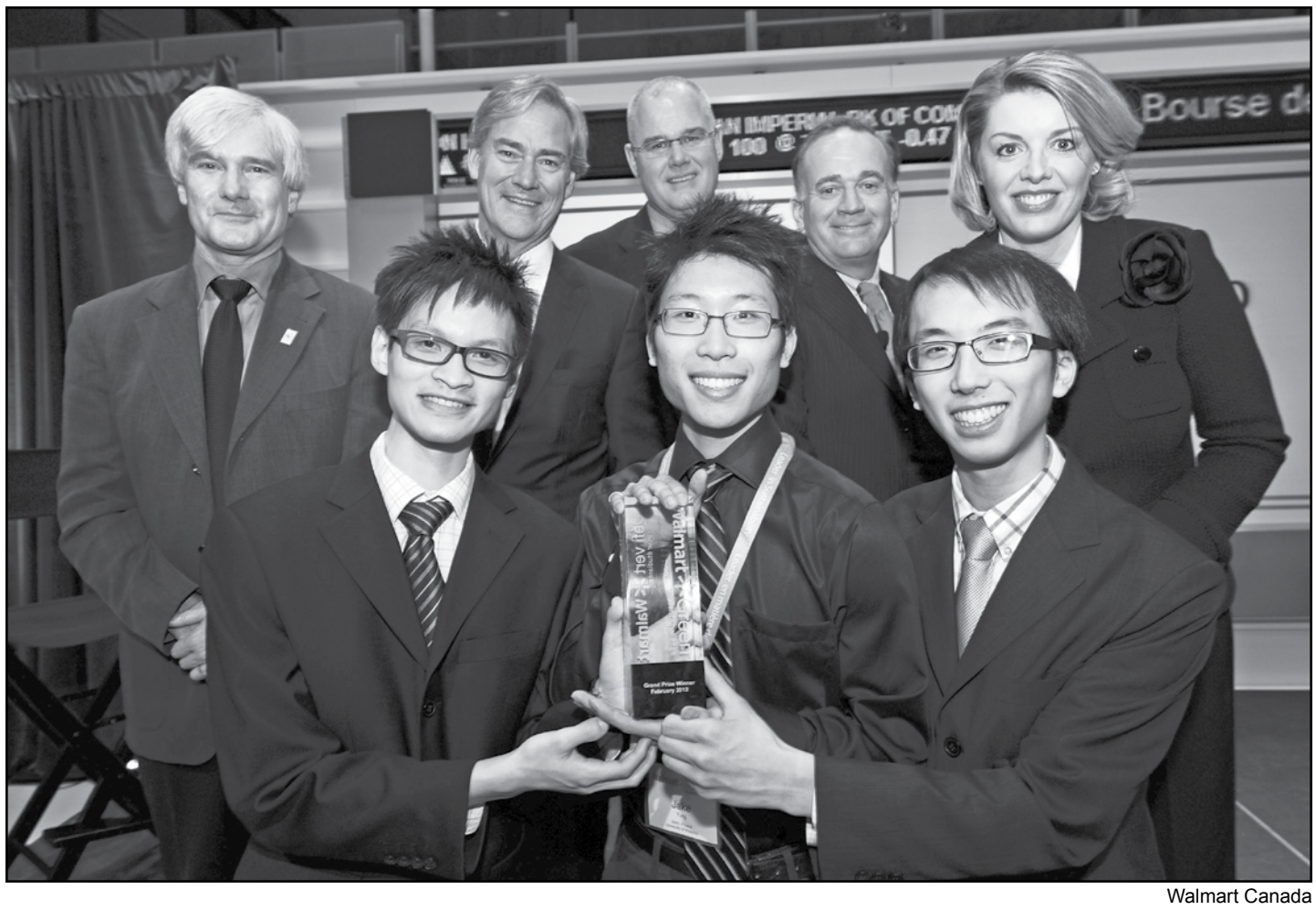
Chem Eng Students Win Environmental Challenge

LEAH KRISTUFEK
1B CHEMICAL



Walmart Canada

The Winning Chemical Engineering students (Arthur Yip, Jake Yeung, and Alan Thai) pose with their prize

Three University of Waterloo Chemical Engineering students will be flying to Calgary soon as a result of winning the Walmart Green Student Challenge. Alan Thai, Arthur Yip, and Jake Yeung were selected from over 100 idea submissions and beat out five semi-finalist groups in the final eliminating round presented to five of Canada's top CEOs. In this contest, Walmart challenged postsecondary students to come up with a completely different look at a business with significant sustainability benefits. Naturally, it was also extremely important that the innovations be cost effective, either saving money or generating revenue. A prize of $30,000 was offered for the top idea and $30,000 for the winning students' school. The fourth-year students have modest plans for their winnings.

The winning plan incorporated wind, solar and hydrogen cells to power what was dubbed a 'sustainable hub'. The plan was designed to power the lights, forklifts, fridges and cash registers normally found in Walmart stores by using a smart electricity grid. The idea was aided by incentives from the government associated with many of these technologies, making them much more cost effective. It is expected that some excess energy could be sold to the grid, particularly during blackouts when more energy could be saved and then sold. The trip to Calgary will allow Alan Thai, Arthur Yip, and Jake Yeung to tour a new Walmart distribution centre where their idea will be implemented.

Hailing from Toronto, Vancouver and Calgary respectfully, Alan Thai, Arthur Yip, and Jake Yeung undoubtedly had vastly different upbringings. However, studying chemical engineering no doubt combined their different perspectives with knowledge to create a feasible solution to the environmental problems which are facing us in the not-so-distant future. Like these students, we are prepared to solve everything and anything society and the world, throw at us.

Gary Webster

HANNAH HIGGINS
1B NANOTECHNOLOGY

The highly publicized firing of TTC Chief General Manager Gary Webster following a special Commission meeting on February 21st has sparked an ongoing media controversy, the root of which questions the justification for Webster's dismissal. Action against Webster was initiated by his refusal to support Mayor Rob Ford's proposal of a Sheppard subway expansion in favour of a plan to build three new Light Rail Transit lines; by a 5-4 vote, TTC commissioners decided to relieve Webster of his duties. This verdict has opened debate regarding the rationalization of dismissing Webster for expressing a professional opinion.

Support of the choice is derived from the opinion that, though Webster's work as a civil servant throughout his career was appreciated, a change in leadership was necessary to keep the TTC progressive. This view has been adopted by Mayor Ford, as well as the five commissioners whose votes finalized the decision to fire Webster.

However, it has also been argued that there was no cause to fire Webster. Ultimately, Webster's job was to advise the City Council by presenting his professional opinion, which he did. The motivation to fire him arose when his professional opinion did not align with that of Mayor Ford. This controversy is heightened by a City Council vote in which a 25-18 majority approved Webster's proposal in favour of Ford's.

Two aspects of Webster's dismissal are disturbing. Legislatively, the mayor cannot overrule the City Council, nor does he possess unilateral control of its decisions. It is reckless to attempt to attain such control by eliminating opinions which oppose his personal agenda. Furthermore, Webster had an obligation as a civil servant and a professional engineer to ensure that his advice to the City Council was indicative of his training and expertise. For Webster to misrepresent or wholly falsify his opinion in this matter would violate the PEO guidelines for professional practice.

Webster's dismissal has inspired grievance amongst other civil servants, who now fear that their professional judgment is a liability, and not an asset. Criticism has also been drawn from politicians outside of Toronto, who claim that Toronto will have difficulty attracting applicants to replace Webster. The crucial factor to be considered is the ultimate ramification of this decision. By dismissing Webster, the TTC commissioners have sent a message that their leader should be primarily responsible to the mayor, and not to the public. The consequences of this stance could create a conflict of interest, in which job security is prioritized above public welfare in the decisions of the next Chief General Manager.

Drummond Report

ALEX HOGEVEEN RUTTER
4B ELECTRICAL

The prognosis is grim. If the government continues spending under the status quo, Ontario's deficit will double to $30 billion/year and its debt to $411 billion, half of Ontario's GDP. In other words, every year, every man, woman, and child in Ontario will be spending almost $3000/year more than they have, a debt which will one day have to be paid back by us and our children. Paying interest on our existing debt is already the third-biggest expense (after education and healthcare). Reducing the deficit to 0, to maintain the debt at 'only' 37% of GDP will require a 17% cut in relative real spending.

To do so, each program would have to average just a 0.8% growth rate per year, far less than inflation. If a single program, healthcare, were to continue at its current growth rate, every other program would actually have to contract at 4.1% annually. In the 'Recommended Scenario,' spending on post-secondary education would continue to rise at 1.5% annually – almost enough to keep up with enrolment increases, but far lower than increases of recent years.

Given the negative impacts and implications of such cuts in the 1990s, the Drummond Report recommends that simple cuts will not be tenable – there must be fundamental shifts in the way money is spent in this province at universities.

The report notes that rising enrolment without commensurate gains in funding have undermined post-secondary education quality in Ontario, even relative to the other provinces. It notes that while tuition freezes are not in the interest of students, many universities have used undergraduate tuition to cross-subsidize research, supporting ambitions to become world-class research institutions. The report notes a better balance is required. Hopefully the university administration at this institution is listening.

Despite the overall negative tenor of the report, an implementation would actually be largely positive for undergraduate students. Ensuring universities make proper business cases for new programs will help protect students from unemployability upon graduation. Refocusing resources and rewards to support teaching and teaching excellence will help arrest the decline in quality at our institution. The report also recommends continuing tuition increases of (on average) 5%/year, which, while still high, places some onus on the institutions to generate cost efficiencies in administrative and back-office functions.

Finally, the report recommends that financial assistance be better targeted for access, which may lead to increases for those who are well enough off to finance their educa-

See DRUMMOND REPORT on page 5

Letter From the Editor:

Fundamental Freedoms - Thought, Belief, and Expression

CHRIS LETNICK
EDITOR IN CHIEF

Hello readers!

As a newspaper, it is important to consider as many viewpoints as possible when expressing an opinion or covering a story. The Fundamental Freedoms section of the Canadian Charter of Rights and Freedom contains this: "Fundamental Freedoms: 2. Everybody has the following fundamental freedoms: … (b) freedom of thought, belief, opinion and expression, including freedom of the press and other media of communication." Although freedom of thought, belief, and expression are all related it is important to distinguish among them and how exercising one freedom can impede others.

As humans, we often enjoy the ability to do whatever we choose. As a society, we create laws that limit human behavior in a way that best reflects the common moral beliefs of those living in it. This allows us to co-exist in large densities without a large degree of conflict. It provides us with a metric for judging whether being angry with a neighbor is justified. But, we also have laws that protect freedoms. The balance of these two subsets creates contention between the right for these freedoms and the ability to restrict behavior such that the majority of the members of a given society do not feel negatively affected by another exercising their freedoms. The types and balance of restrictions and freedoms forms the basis for how we judge politics, both locally and internationally.

Freedom of thought is the freedom to mentally process a novel idea or an idea expressed by somebody else. Freedom of thought is a concept that has long been accepted as important to a democratic society. However, most people regularly have their freedom of thought violated. Though there have never been successful restrictions on what one may think through laws, the biggest threat to a person's freedom of thought is themselves. People hold beliefs. A person often uses their belief structure as a filter to their thoughts, instead of as a result of their thoughts. This happens when one chooses to not contemplate something because they believe that they already know the answer. Unfortunately, answers often change and nothing guarantees that the correct conclusion was reached the first time. Therefore, it is almost always beneficial to rethink previous conclusions when provoked. This being said, it is not wrong to rely on emotions for some decision making. Some issues we think about are personal, and it is important to make decisions that contribute to increasing or maintaining enjoyment, rather than only worrying about being correct. If it was required that everybody makes decisions solely on proven facts, it could be concluded that there is only one correct conclusion.

Freedom of belief is the freedom to hold a belief that an opinion or concept is true. Beliefs differ from thoughts in that beliefs are those ideas which we think to be true. By beliefs, I am not specifically referring to religious beliefs. Religious beliefs are often categorized separately. This freedom is also held as an important aspect to a democratic society. Many protests and revolutions have occurred to liberate a person's freedom of belief. Freedom of belief is easier to suppress than freedom of thought, but it is also easier to regulate against suppression. In Canada, the freedom of belief is rarely suppressed. However, it is often abused. The freedom of belief is abused through the encouragement of incorrect beliefs. As mentioned above, we abuse our own belief structure to avoid the effort of reevaluating our beliefs. However, others may infringe upon your freedom of belief by abusing their freedom of expression. The best way to protect yourself from this is to do unbiased research when forming these beliefs. When forming any new beliefs, make sure to excursive your freedom of thought. Again, there is nothing wrong with relying on emotions and past experience for reaching subjective conclusions. Without these inputs, subjective ideas would just represent objective ideas with a little less precision instead of representing a different point of view. By naively removing this "human factor;" it could be argued that every person should have the same beliefs, defeating the value of the freedom entirely.

Freedom of expression is the freedom to express a thought or belief. The freedom of expression is the most restricted of these three freedoms. This restriction occurs because, unlike thoughts and beliefs, a person's expressions affect their surroundings. Expressions can, therefore, be measured and laws can be made around their effects. In other places in the world, this ability is abused to ensure that the ideas being expressed are in agreement with the regional politics. In Canada, laws restricting the freedom of expression exist with reason. For instance, it is unacceptable to express beliefs in a way that harms another person physically or mentally. However, there is little restriction on providing false information. This allows anybody to promote their own ideas to others without repercussion for the integrity of their ideas. A person may express false ideas because they believe it is correct or because you believing it could benefit them. For example, a person may tell you that a contract has no negative implications even when it does. If you accept this as a belief without exercising your freedom of thought and belief by reviewing it thoroughly and coming to your own conclusion, you may be trapped by their abuse of their freedom of expression. Similarly, a news source may label an opinion article as news when it contains biased and non-thorough analysis. There is a certain American news station that is well known for containing a strong bias on the majority of their content. These abuses of the freedom of expression hinder human progress. However, further restrictions to the freedom of expression would also hinder human progress. For this reason, it is important to exercise the freedom of thought and belief when evaluating an idea that has been expressed to you.

While reviewing how these freedoms interact with each other, some important points have been expressed. It is important to exercise your freedom of thought without letting your beliefs or another's beliefs get in your way. Make sure to appropriately contemplate information provided to you and to avoid believing something for the sole reason that another person expressed it as their belief. It is good to keep an open mind. However, people will abuse their freedom of expression so stay vigilant when accepting the information.

THE IRON WARRIOR

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Midnight Sun X Returns from Australia

ABY MAHMOUD
2A MANAGEMENT

It felt weird getting out of bed on a Friday morning and going to work dressed formally. As a co-op on the Midnight Sun Solar Race Car Team, I am free to wear whatever I want to work. However, today was different; it was Homecoming and we were celebrating the return of our beloved 10th generation solar car.

On Friday, the 17th of February, E5 foyer looked different than usual. It had a stage, a screen, a projector, chairs, tables and, most importantly, our solar car! We had set all that up for the arrival of our sponsors and supporters. They were invited to celebrate our car's return with us; after all, they were the ones who made the building of the car and our participation in the World Solar Challenge possible.

The World Solar Challenge is a solar car race in Australia that occurs every two years. Solar cars built by different teams from all over the world come to compete. As a participant in this race, Midnight Sun X raced 3000 km from Darwin (a city in the north of Australia) to Adelaide (a city in its south). Thanks to the team members who were there, the car was able to race for 8 hours a day for 6 days. It ran on a cruising speed of 90km/h while using less power than that of a microwave! Keeping it running for this long with Australia's tough weather wasn't an easy task.

At 3 pm, sponsors and supporters started arriving. My team and I greeted them with enthusiasm, showed them the car and answered all of their intense questions. They looked around our bay (i.e. our workplace) to get an idea of where our inspiration is found and where our ideas are created. By 3:30, E5 was filled with team members and sponsors/supporters coupled up and discussing the car. Snacks were served and pictures were taken.

By 4 pm, everyone we were expecting had come, so Kevin Kyeong, the project manager, began his speech. He started off by thanking our sponsors and supporters for coming, the team members for organizing this event and Jacqueline's catering for providing the food. He continued by thanking our sponsors for their help to the team and the car; if it weren't for them, we would not have gotten this far. He then called each sponsor up to stage, shook their hands, presented them with a Midnight Sun souvenir and took a photo. Applause and cheers could be heard all around the first and second floor of E5.

And that was the end of the "organized" part of event. Some people stayed a little longer to ask more questions and take some photos with the car while others collected their coats to leave. Midnight Sun X's return was fun and enjoyable.

Wayne Hsu

Midnight Sun X coming back home after a long drive

Project Magazine UW

KRISHNA IYER
GENERAL MANAGER,
PROJECT MAGAZINE

Recently, it was announced that the bid to run Project Magazine was won by Waterloo Engineering. This means that all production of the magazine will now occur right here. Project Magazine is a national magazine aimed at engineering students across Canada. It is the official magazine for the Canadian Federation of Engineering Students (CFES). This agreement now means that University of Western Ontario's Engineering Society no longer is in charge of the production of Project Magazine.

This gives the opportunity to Waterloo Engineers to experience the opportunity to run a publication from scratch. Every aspect of magazine publishing (except printing) is being managed in house. This includes advertising, content solicitation, editing, layout, design and web development. Project Magazine is looking for volunteer staff and if you are interested in any of the above aspects of publication management or you would like to advertise with us, please get in touch at *promag.cfes@gmail.com.*

UW_NRG + Nano-Olympics

SUSAN PATCHETT
1B NANOTECHNOLOGY

Hello engineers and other readers of IW, and welcome back after an awesome reading week! I hope you all had your share of relaxation and fun!

I wanted to say thank you to everyone who attended the Nano-Olympics this year. If you were near CPH around 12:30-2:30 on February 6th, you might have noticed the tables set up and the people hanging around, playing games and talking about nanotechnology. These were the Nano-Olympics. There were many fun events such as Nano-Horse Racing, "Are You Smarter Than an NE Student?" trivia (Who are Buckyballs named after? What length is one beard-second?), and the popular Great Buckyball Challenge. Competitors were challenged to make as many shapes out of Buckyballs as they could, with each shape scoring points, and the winner walked away with a full set of Buckyball magnets! The winner this year was Sheryl Peters in 1B Nano.

UW_NRG is still working hard on their microrobots and they are planning to compete again this year in the National Institute of Standards and Technology's (NIST) annual Mobile Microrobotics competition. Last year they took home first prize despite being the only Canadian and only undergraduate team competing. This year, UW_NRG is hoping to bring home first prize again with a new version of their EMMA (ElectroMagnetic Micro Actuation) microrobot. In addition, the team will enter PAMELA (Pump Actuation Mediated by Excited Light Absorption) in the competition; a microrobot made of a photosensitive material that will propel itself forward when a laser is shone on it. Follow us on twitter (twitter.com/UW_NRG), Facebook (facebook.com/uwnrg), or check our website (uwnrg.org) for updates and information on future events, as well as more information on current microrobot projects.

Uprisings in Syria

LEAH KRISTUFEK
1B CHEMICAL

Syria has joined an increasingly long list of countries whose citizens have decided to stand up to an oppressive government. Unfortunately, social justice is coming at a high cost to the people who are living in the midst of the conflict. It is said that 'All is fair in love and war' but we witness the atrocities every single day where a general love for humanity is sacrificed in pursuit of higher status. Justice and freedom are all well and good, especially if they are values you believe strongly in and you are willing and able to fight for them. However, war is very rarely fair and many innocent people get caught in the crossfire. For many people, peaceful lives have become no more than a wistful memory from earlier times. This harsh reality is especially true for the city of Homs in Syria. Through the intervention of other countries, the Red Cross has finally been given permission to remove and treat the innocents trapped in this potentially deadly situation. The anti-government rebels decided to retreat from the city and the surrounding area after 27 days of continuous government shelling. They reason they cited was concern for the civilians who had no access to safety or basic medical supplies and, of course, were under significant risk of death from government bombardment. It took the deaths of American reporter Marie Colvin and French photographer Rémi Ochlik on February 22nd to bring the attention of the world to this country's conflicts.

The uprising began in late January 2011 in response to the current one party rule which has maintained complete control since the ascension of Bashar al-Assad to power in 2000 following his father's death. After unrest broke out in January 2011, the Syrian army was dispensed to quell the protests. Soldiers 0who refused to fire on civilians were similarly executed. An atmosphere of fear and repression continues to be spread by the ruthlessness of the ruling party. The forces fighting in opposition to the Syrian governments have unified under the name of the 'Free Syrian Army.' In order to overthrow the current governmental regime in favour of greater civil rights and better humanitarian conditions, the Free Syrian Army relies heavily on international communities to increase sanctions and provide aid. Having the world aware of the plight of the Syrian people is incredibly important for the Free Syrian Army to continue its fight and is likely the reason the anti government rebels stayed in Homs for such a long time. In fact, the suburb of Baba Amr has become a symbol of rebellion. Currently, the death toll due to this conflict has reached 7,500 according to the U.N. For more information on the continuing struggle for freedom in Syria, check out the links below:

Government Liaison Program

ALEXANDER HOGEVEEN RUTTER
4B ELECTRICAL

Saturday, February 25th marked just the second time students had been invited to the local PEO Chapter's Government Liaison Program's Conference. The event heard from local politicians and policy experts, and discussed the relationship engineers do play and can play in the political realm. The event was hosted in Cambridge; engineering students from Waterloo and Guelph were on hand to learn about the process and network with members of the PEO.

The day started with Mark Kealy, Chief Advocate at Kealy and Associates. Kealy shared his extensive experience working to advocate on behalf of pharmacists. It was clear their advocacy association is much more aggressive in pushing and shaping policy in Ontario and across Canada. However, he also brought a cautionary tale of the Chiropractory association which had campaigned too personally against individual politicians and had been burned badly by subsequent legislation.

Kealy intoned strongly that engineers can learn from Nursing, Physician and Pharmacy Associations which regularly comment and advocate not only on issues directly related to their own regulation, but of more general interest to their professions as community members and leaders. Especially in the context of the recent identity crisis between OSPE and PEO, it posed an especially poignant question for PEO, and engineers at large: while we are taught to become experts on our own specialty area, what role do we have in promoting and critiquing public policy more generally?

The next speaker, Elizabeth Wittmer, our local MPP, talked about the difficulty for politicians in getting the opinion of local constituents. She made it clear that input from constituents, either from an individual or organization (eg. PEO) is always welcome at town halls, Policy Advisory Councils and more informal mechanisms. In fact, she specifically mentioned that professional associations can generate useful ideas for amendments of various government bills. She painted a compelling image: a new bill released and her with just a few minutes to publicly respond. An organization with an opinion or critique would not be seen as a burden, but in fact a saviour – giving her, as a critic, ammunition to stimulate debate. Wittmer gave the distinct impression that with so few people willing to be engaged in the process, those who are capable of providing opinion, especially those which can be perceived as 'expert', can drastically influence the political process.

Next up, Howard Brown of the PEO spoke to issues that impact engineers and how they can engage politicians. PEO cited five main current issues for engineers in Ontario:

- The Ontario Building Code
- The role of OSPE
- Open for Business Act
- Green Energy Act
- The budget and economy at large

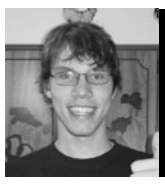
The Open for Business Act includes a provision to repeal the industrial exception, which currently allows industrial concerns to go without professional engineers, provided they agree to accept complete liability for their work. After decades of advocacy, the provision has been successfully repealed and it is now a matter of implementation. The last two issues are especially interesting as they are not regulatory issues per se, but, as Kealy suggested, warrant opinion from the engineering community. The discussion revealed the complex relationship between the PEO's Government Liaison Program, which serves primarily to engage engineers in the political process on regulatory issues and OSPE's Political Action Network, which serves to promote the issues of engineers within the province. Clearly the Green Energy Act and the budget both influence and are influenced by the actions of professional engineers and the question remains which forum to best project those concerns.

The next speaker was John Milloy, MPP for Kitchener-Centre and former Minister of Training, Colleges and Universities. John firmly portrayed that it is not government's role to create innovation, but to put the foundation for innovation in place. He then connected this idea to the need for engineers, with our unique knowledge and skills sets, to get involved rather than letting others run the show. While the PEO members seemed hesitant to move beyond the importance of a P.Eng in engineering work, John Milloy was adamant that engineers and those with engineering backgrounds can and should use their skills more broadly, as our education prepares us not only as engineers but as critical thinkers and analysts. This was particularly poignant to the engineering students present, in that our skills are valuable outside of the traditional realm of engineering. One of the main goals of GLP, in fact, is to promote the message that if engineers are not proactive in bringing our issues, as well as critical analysis to the debate, it will be left to others. The discussion came to the number of engineers who go on to license (apparently outnumbered by the number of foreign-trained engineers who license in Ontario), but it wasn't entirely clear if the skills developed by engineering students (even without a P. Eng) would not still be valuable.

The final speaker was Diane Freeman, past President of PEO, City councillor in Waterloo and environmental engineer with Conestoga Rovers and Associates. Her speech really connected the value of engineers, not only as number crunchers, but those who serve the public. She reminded those present that our analytical decision-making, our comfort with collaboration and teamwork, our ability to work within constraints or "givens", and our ability to use the language of technology cross-culturally will serve us well outside of the engineering realm. She talked about how her analytic ability made her better able to hold civic officials accountable. An important example she shared was how she was able to successfully hold firm on a decision by community planning officials to build a roundabout on the bases of cost, safety and convenience, despite public opposition. Though it was not her area of expertise, her engineering experience aided her in critically absorbing the report from the engineers and serving the interests of public safety, despite opposition.

This example and others spoke to the need of engineers to actively engage in public life – our unique skills and knowledge make us ideal candidates to make decisions rationally and for the greatest good to all stakeholders. Freeman's success in navigating engineering and public office concurrently spoke to the possibility, and importance of what all present agreed: it is critically important for engineers to not only become knowledgeable, but take an active role in influencing political affairs.

The Single-Atom Transistor



MICHAEL LAANVERE
2A MECHANICAL

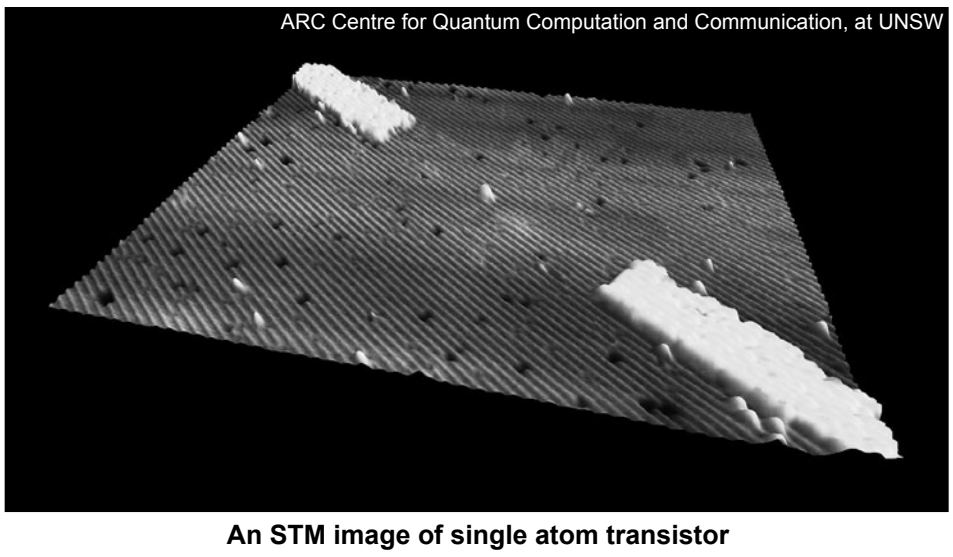
Earlier in February, researchers in Australia were able to make a transistor out of a single atom. The transistor consists of a single phosphorus atom encased in silicon. Although single-atom transistors have been created before, they have never been made with such precision and were often created by chance.

The transistor was created by placing a silicon crystal in a vacuum and using a scanning tunnelling microscope to replace one atom of the six-atom lattice with a phosphorus atom.

Transistors are the basis of computer chips and their purpose is to control and amplify electrical signals. Smaller transistors mean more on a chip, which makes the chip more powerful for its size.

Moore's law was predicted by one of the founders of Intel, Gordon Moore, and states that the amount of transistors that can fit on a chip economically will double every 18 months and the trend has continued for over 50 years. For the law to continue, atom sized transistors must be used in 2020. Whether or not a manufacturing process will be available in the future for this single-atom transistor is still unknown, especially since it currently operates at temperatures around -196°C, so whether or not Moore's law will be upheld is uncertain.

This transistor is by no means a practical product yet, but it has proved that a single-atom transistor can be consistently created. Although we won't be seeing this technology in our computers for many years to come, the creation of the smallest transistor possible is a big step towards that goal.



An STM image of single atom transistor

An Introduction to Your Custodians

CHAD
XU
3A MANAGEMENT

In their iconic teal-green uniforms, the members of the custodian team are easy to recognize. Anyone who happens to be passing the the corridors of the engineering building late at night will have seen their carts and we all appreciate the clean buildings that we study in. Many of us are familiar with their faces but when was the last time you actually met them? For example, Mila is a member of the custodian team who cleans up the messes we leave behind.

"I came to Canada in 1977 from Yugoslavia. I had originally only wanted to stay here for a few years and then go back, but life is always changing. After having kids, and seeing the war back home in the 90's, I decided for good that I was going to stay here," said Mila.

Like Mila, almost all of the custodian staff responsible for the engineering buildings are immigrants from foreign countries, a similar scenario to many of the students currently in engineering. They came to Canada seeking a better life and a brighter future not only for themselves, but for the next generation. In order to reach Canada, however, many of them took extraordinary measures, and some even risked their life in the process.

Al, a gentleman easily recognizable by his cheery smile, glasses, and friendly demeanour echoes this sentiment. "I was a young kid back then, only 19 when I moved here. I came here because I was tired of the dictatorship government in Azores. It's a tiny island in the middle of the Atlantic, ruled by Portugal."

However, the emigration process was never easy, and it holds especially true for a country ruled under a dictatorship. "For me to leave the country, I had to join the Army and do my service first. So I was deployed to Africa for two years during the Guinea-Bissau War of Independence. Twenty-six months and sixteen days, that was the exact number, it's something that you don't forget," Al recalls vividly. "The war over there was like our Vietnam. There were a lot of traumatic things I witnessed, but you put it all behind you."

Chad Xu

From the left: Mila, Maria, Al, Momo, and Karol

Many of the custodians also voice the notion that political oppression was another contributing factor in shaping their decision to immigrate to Canada. Karol, for instance, left his homeland of Czechoslovakia after much of Eastern Europe fell into the strict grip of communist regimes.

"I came to Canada in 1978, from Czechoslovakia. My family lived close to the German border in Czechoslovakia, in Sudetenland. After WWII, it was ruled under a communist dictatorship," Karol recalled. "My journey started when I bought a ticket for a plane headed for Cuba. When the plane had to refuel in Montreal, that was when I made my escape. There were undercover StB (State Security) agents from Czechoslovakia on the plane to make sure nobody defects. But I realized that this was my only chance and I snuck away to the immigration office at the airport and requested political asylum. If the StB agents caught me, I would have been put into prison back home for a long time, or even killed. When the immigration officers asked me whether I wanted to pick up my suitcases from the plane, I said, 'Nope, I'm not going back in there.'"

However, reaching Canada was only the first step. Adjusting to new lives in a foreign country isn't always easy. Language barriers coupled with diminishing prospects of employment often prove to be difficult. "I had a lot of problem with jobs. This job is the first job that I am satisfied with since coming to Canada. I was an agricultural engineer with more than 20 years of experience back in former Yugoslavia, but when I moved here, I couldn't find a job in my field," said Momčilo, known affectionately as "Momo" by his peers and many students.

Even in the presence of stable job prospects, employment was still never guaranteed, as Maria remembers her own employment history. "I worked for the government for thirteen years; then the division I worked for closed down and I found myself working briefly at Colonial-Cookies before coming here. It's been nine years now."

It is unspoken within organizations, but new immigrants are often the first batch of employees to be laid off when it comes to downsizing. The specific reasons are complex, but communication skills and prejudice against newcomers usually play a significant role.

In the midst of the discussion concerning the employment woes faced by everyone, Mila spoke out, "You have to support the kids no matter what."

Momo quickly reflected upon this and responded, "Me and my wife worked at multiple jobs, and we try to make money the best we can to help our kids get through university. I am happy because I have two children, and they both have a good education and good jobs. My daughter works at Scotiabank, and my son works at Mozilla, I'm proud of them."

"I also have two kids, a boy and a girl. My son is 22, and my daughter is 16," said Maria.

Many of the custodians' children are no different from us, who embody the hopes and dreams of their parents. Indeed, it is the custodians who clean up after us, pamper us, and who, just like your parents, believe in the futures of the youth they are caring for.

So strike up a conversation with the custodians once in a while and let them know how much appreciate their work. They are some of the friendliest people you'll ever meet, you have my word.

Your Bi-Weekly Challenge

KATE
HEYMANS
2T CHEMICAL

As you've got less than half the term to go at this point, it's time to start looking forward to the future. This is a goal for the next term that you're on co-op. I'm sure we can all think of the ways we would spend extra money if we had it right? So why not attempt to make extra money?

You don't have to find the highest paying jobs or look for something less than legal, I'm talking about part-time jobs. I would not advise such a job during a school term (we all know that all those courses, labs, assignments and etc. take up far too much time already). Why not during a co-op term when you're stuck in the middle of nowhere (and bored out of your mind)?

If you are on campus, there are plenty of opportunities for part-time jobs. Even within the Engineering Society, you can get a part-time paid position as either an Orifice (EngSoc Office) staff member or working for the ever-popular CnD. If either of those appeal to you, talk to Mary Bland, the EngSoc Business Manager (also known as the really nice lady in the Orifice). If your grades are high enough and you've got an interest in research, maybe an Undergraduate Research Assistantship (URA) is the way to go. The Dean's Office publishes a list of faculty potentially interested in hiring URA each term or you can approach other faculty members.

If you would like to wander away from the engineering buildings, there are other opportunities on campus. Some student groups will hire for part time jobs. Imprint, for example, has part-time, paid positions (on that note: can I get paid?). Other organisations on campus also offer part-time jobs. Retail services hires cashiers. Food Services has well... food jobs. Campus rec hires referees. Even the Office of Development hires students. If you look around there are plenty of opportunities

Even if you are out in the middle of nowhere, far from your favourite university-city, you can find plenty of part-time jobs. Tutoring, baby-sitting, clearing snow and cutting grass are in demand almost anywhere and they can easily fit around a full time co-op job. They also don't require long-term commitment. Kijiji can be a great place to advertise for such a position or you can post offers on your company's bulletin boards. Local stores and fast-food joints also often offer part-time positions which you could fit around your schedule although these require more commitment. Whatever local community you end up in, you can certainly find a part-time job.

So next time you find yourself thinking that you're bored, start looking at all those part-time opportunities. They'll give you a chance to develop some more skills, to meet some interesting people and to make a little money on the side.

Drummond Report

Implications for Ontario's Post-Secondary Education

Contd. from DRUMMOND REPORT (pg.1)

tion, but could further enhance opportunities for low-income students.

Hopefully students will read the report, get informed, and demand action from our administration. We are not alone in desiring cost containment and renewed emphasis on teaching quality.

I would encourage everyone to read the entire executive summary for themselves, form their own opinions and consider seriously the changes that are going to be required in Ontario for our system to be sustainable, not just in the post-secondary sector. While some sacrifices are necessary, the report makes clear that many savings can be achieved through better targeting and efficiencies.

For more information, visit *http://goo.gl/bIWsD*

Programming for N00bz: C++

JOSHUA KALPIN
1B SOFTWARE

Hello readers! I'm back for third edition of Programming for N00bz. This week we are going to cover another widely used programming language here on campus and in industry, C++.

C++ was originally designed as an upgrade to C, but eventually became the completely separate programming language that we know today. As a result, C++ is completely backwards compatible with all features that are included in C, such as dynamic memory allocation and the ability to program at a very low level in the computer.

However, C++ adds Object Oriented Programming (OOP), which allows the programmer to represent various components of a program as objects which can be modeled after real life objects. It also features improved methods of handling errors in the code, the ability to assign context sensitive functions to operators (+, -, >, etc.) and a whole slew of libraries that contain pre-built templates for data structures. There are also some improvements to the syntax that make C++ code easier to read and comment (add non-code explanations to what the program does) when compared to that scary mess I showed you in last week's column.

So now that we've covered some of the new features added to C++, who exactly uses C++ at the University of Waterloo? In first year, Software, Systems Design, Mechatronics and Mechanical Engineers take courses that are taught exclusively in C++, with Mechanical engineers also learning Robot C which is very similar syntactically. In upper years, Electrical and Computer Engineers, and almost all students in computer science-related majors, use C++ extensively.

In industry, C++ is one of the most widely used programming languages, with almost every large tech company (Google, Facebook, Amazon etc.) putting it as a requirement on a majority of job applications. Moreover, almost all games on your computer or video game console are primarily programmed in C++ and knowing C++ is the easiest way to become a video game programmer.

C++ use is widespread partly because of the backward compatibility with C. Most graphics engines and large-scale programs require many lower level components (working with hardware instead of the operating system). Since C++ has the low-level abilities of C and the higher-level abilities that languages such as Java and Python offer, it is a natural choice when building a program that contains both high- and low-level components.

In a more physical sense, languages derived from C++ are used to program many microcontrollers used to build robots and other mechanical and robotic systems. This is probably the primary reason that Mechanical and Mechatronics Engineers learn C++ and luckily the applications are visible in their programming courses.

So the last question is why would someone who doesn't have a programming related job or major learn C++. Other than the robotic and mechanical applications with microcontrollers there isn't much incentive except interest. However, if you ever want to learn programming for hobby or career purposes I highly recommend picking C++ as a starting point because of its versatility.

To conclude, C++ is a widely used, versatile programming language that combines the low-level applications of C and the higher-level abilities of more modern languages into an extremely dynamic package. It is widely used in the university and in industry while serving as the backbone for many of the programs that you use on a daily basis.

That wraps up this week's column. Next week's column is the last for the term and its language will be a pleasant surprise.

A New Kind of Fundraising

LUCAS HUDSON
2A MECHATRONICS

Fundraising can sometimes be a daunting and laborious task. While you typically see a cute elementary student selling chocolate bars outside the local grocery store or people begging for money at your door step, the Midnight Sun has come up with new more exciting and fun ways to raise money.

March 1st brought us the first Midnight Sun: League of Legends Tournament. The tournament garnered a great turnout with eight teams participating; each consisting of 5 players. The games were played in the RCH 101 lecture hall where space was limited but Midnight Sun did a good job of using what space they had. Every game was projected on the wall provoking strategy discussions and roars of excitement every time an exciting play happened. As the first time Midnight Sun had ever hosted a gaming tournament, it was at times a bit bumpy. The beginning of the tournament was delayed about an hour and the aforementioned lack of space was annoying for players, but these small issues did not take away from the tournament in the slightest.

The Midnight Sun team charged $10 for each team to participate and sold pizza, drinks and raffle tickets. The money raised from the event will go towards funding the 11th Midnight Sun Solar Vehicle. The success of the event was evident after talking with some team members. All of them were very enthusiastic with the outcome of the night and said they planned on hosting another League of Legends tournament in the near future. It is refreshing to see the engineering team step away from traditional fundraising and move toward something unconventional, something we can get involved in and enjoy.

In fact, something not just males can enjoy. While gaming is traditionally seen as a male-dominated culture, a significant number of women showed up, not just to play but also watch. As a man who predominately plays video games with other men, it is encouraging to see more women involved in gaming. It is also nice to see the female members of Midnight Sun getting involved in the planning an execution of such an event.

Overall, the event was a great success and a wonderful idea. It was an amazing first effort from the Midnight Sun team and something I would definitely want to participate in again.

3D Printers Now Printing Muscles

FARZI YUSUFALI
2T NANOTECHNOLOGY

3D printers, normally utilized in the fields of architecture, aerospace engineering and materials science, boast a new application in a field that one might not expect. Usually, 3D printers are used to rapidly create prototypes of new structures without ever having to cast a mold to do so. For instance, a hand-crafted gargoyle (similar to those fashioned on cathedrals) could be scanned by associated software after which the 3D printer would make an exact replication of the figurine using an inexpensive resin.

Thanks to the recent breakthrough *Organovo*, a San Diego-based start-up company, 3D printers are now able to successfully print thin layers of human muscle in an arrangement such that the cells are allowed to grow to form working tissue. Unlike other approaches to deposit cells using printers, their technology has successfully allowed cells to interact in much the same way that cell do when building new tissue (in the body). Like growing tissues in the body, *Organovo's* technology allows cells to adhere and exchange chemical signals with each other after deposition thereby crossing the bridge (so to speak) between growing a cell culture and growing a functioning tissue.

While putting cells into specially-made cartridges and putting them into the 3D printer seems simple enough, the novel process (unique to *Organovo*) of preparing the cells so that they behave like human cells after deposition is what has made this biomedical advancement possible. First, like most biological labs, the researchers must grow the cell culture first before applying an enzyme that frees the cells from the growing surface. Next, the cell culture is packed into dense pellets and are then sucked up through a glass capillary tube and incubated. The step of keeping the cells confined is what allows the cells to start to interact with each other. Once the cells are a discernable unit, they are freed from the tubes and submerged in nutrient-rich "broths" that allow the cells to grow, feed and interact similar to building new tissue in the body. After this phase of growth, the cells are then sucked back up the glass capillary tubes which now serve as ink cartridges. Using 3D printing software, the shape in which the cells are deposited can be programmed such that they are arranged in conformations normally found in the body. The printer then deposits the cells, one line at a time, onto an inert gel in a distinct pattern that was previously programmed. After longer periods of incubation, *Organovo* found that this pattern of cells would grow and congregate to form a single piece of tissue.

Needless to say, such a procedure has taken the field of tissue engineering by storm. This method can potentially render other tissue-growing techniques obsolete due to its simplicity and cost-effectiveness. For one, current tissue engineering techniques requires the synthesis of a "simulated biological environment" tailored to each cell type. Unlike the accepted procedure mentioned, 3D printers have the flexibility to grow a variety of cell types. A more immediate outcome of *Organovo's* success is the promise of using these tissues in drug trials. With these simulated tissues being almost indistinguishable to extracted human tissue, *Organovo's* new method would be instrumental in identifying drugs that would fail long before reaching clinical trials; this would save drug companies billions of dollars. With the intention of proving that this technology can detect drug toxicity earlier than other methods, *Organovo*, not surprisingly, is planning to fund this research by getting major partnerships with companies starting with the pharmaceutical Goliath, Pfizer.

Future of Gaming: PS Vita vs. 3DS – Where is the Battle?

JON MARTIN
OBI JON1138

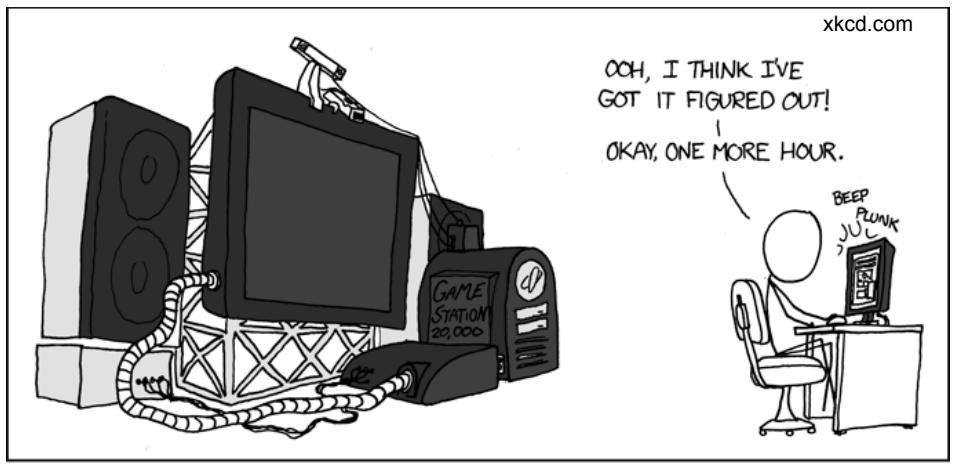
Well avid gamers, and those who are reading this because your current lecture isn't exactly the most fascinating thing on this planet, you may have heard that Sony have released the long awaited sequel to their Playstation Portable system – the PS Vita. Oh, you didn't hear about it, you didn't camp out in front of the electronics store to get it on midnight of launch day? That's not a problem, because it doesn't look like anyone else did either.

For the last few years people have been talking about the eventual successor to the PSP. Would it also be a phone? Would it abandon the failing UMD format in favour of digital downloads or more common flash-based memory cards? What would the graphics be like – PS2 level or something to truly rival the PS3 and really shake the mobile gaming market? My biggest requirement in a new PSP (which I have mentioned countless times in this column over the years) was the inclusion of a second analog stick. For years I debated buying a PSP, both for the games and the media player capabilities, but the inability to fully mimic the controller scheme of a console always stopped me, and now that it is finally available? Well, to be honest, I really don't care anymore.

I don't think that it's just me either; I think a fundamental shift is occurring in portable gaming and the days of a dedicated portable gaming system are ending. I have mentioned the failure of the Nintendo 3DS already in previous articles, but I was waiting to see if the PS Vita would prove my theory wrong. The 3DS was a commercial disaster, and this was readily admitted by Nintendo when they drastically dropped the price of the unit within a few months of its release. I was hoping that this failure was the result of Nintendo oversaturating the market with new versions of the DS, just think about how many versions there have actually been. There was the original DS, the DS lite, DSi, and the DS XL, all of which were pretty substantial changes to both the hardware and the built-in software, and then they added the 3DS. With each successive version, Nintendo has taken the same marketing approach that Apple is famous for – showing you that the newest version is the only one that will make you the most popular, and that anything else is just old technology. But Nintendo jumped the gun by employing this same strategy to promote a new version of the DS which was based entirely on the new 3D technology. While many people flock to theatres to watch the newest blockbuster 3D movie each summer, they aren't exactly rushing out to spend the money on 3D TVs and glasses. 3D is still a technology that many people seem to view as being unproven and too expensive – really only for those early adopters with the money to spend, and the insanity to match. I'm really talking about the big screen TVs with the $100 glasses. Computer monitors and passive 3D technology are readily available and reasonably priced right now – so don't think I'm entirely against 3D – I'm not, I own a 3D PC monitor. The real problem is that Nintendo's market is still mainly composed of children, and parents aren't very likely to spend their money on a new DS that uses costly and unproven technology (there are currently tests going on to look at possible health effects) for their kid.

I hoped that the new PSP would have a much stronger launch than the 3DS because it is a very substantial change to a line that really hasn't seen that much change over the years. True, there have been revisions to the PSP that included larger and higher resolution screens, better battery life, or a better processor, but you could still pass someone on the street carrying a PSP and not know if it was a first generation or a fourth. Sony tried to shake things up with the PSP Go, which was an entirely digital distribution based system, but other than the removal of the UMD slot (and the ability to play some games as a result) there really weren't any changes. The PSP Go has pretty much failed by this point as well. The PS Vita appeared to have the ability to revitalize the traditional portable gaming market, but then release day came and went. There were no news stories about people lining up for the new system, there weren't any riots when the stores sold out, and there wasn't even much of a stir on video game news sites.

If Sony cannot stir up excitement about the new system and boost sales, I'm guessing that the PS Vita will soon see a substantial price drop similar to the 3DS.



Now it is time for both Sony and Nintendo to admit defeat in the portable gaming market. It hasn't been stolen by another competitor – Microsoft never even challenged either of the giants. Instead, it has fallen to smartphones and mobile gaming. If Sony and Nintendo want to still make the kind of portable games we have seen for years on the DS and PSP, they are going to have to start developing games for Apple and Android phones. They need to abandon the idea of producing their own system in favour of producing the games that play on someone else's technology – similar to what SEGA did when they abandoned console manufacturing. People are still willing to spend the money on a home gaming console and $50 – 60 for a game, but they are no longer willing to pay that kind of money for a portable game. Similar to flash games on the Internet, $1 games are what most mobile gamers are playing now, but the capability is there in many current smartphones to run a game with PS2 level graphics – there just needs to be a company out there developing that game.

I haven't really mentioned Microsoft that much in this article and that is mainly because they never really entered the portable gaming market. Even though there were rumours, speculation, and plenty of people willing to open their wallets for an Xbox Portable, Microsoft never took the leap. Maybe that was because they were hoping that Windows Phone would become the next big competitor to Apple, but they might have lost out to Android at this point. I personally think that Microsoft has probably been looking into portable gaming for many years but maybe they saw the trend towards mobile gaming earlier because they were viewing it from the outside. Sony and Nintendo are both stuck inside the dying genre of portable gaming, and they each have products that are doing reasonably well, but aren't making them huge profits – and probably never will. Eventually they are going to have to accept their losses and branch out into other genres of gaming – maybe developing the next Playstation or the new Wii. Oh wait, isn't the Wii U coming out soon? Whatever happened to it?

To end this off, if you did actually buy a PS Vita when it came out – congratulations, let me know what you think of it and just think, you may be the owner of a very rare product if they end up canning the system. Seriously though, enjoy the games and support the system if you like it. To everyone else, I'm going to grab my phone and play some Plants vs. Zombies now, Keep on Gaming.

Defying Gravity: Colonization and Mining

GRIFF FERGUSON
4B CIVIL
MIKAYLA MICOMONACO
4B ELECTRICAL

As the human race's population and dependence on raw materials continues to grow, space colonization will become a possible means of coping. Examination of several planetary bodies within the solar system reveal that they have significant mineral wealth - in particular an asteroid (Near-Earth Object) is estimated to have more recoverable metal than has been mined in human history.

Colonizing and mining space bring up a new set of political and social issues to be addressed. Our current international laws will not be sufficient to handle issues such as ownership or the rights of colonists. Who will own these new colonies? Will they have direct ties to existing Earth nations, or will they be new nations which govern themselves? At what point does a colony become an independent country?

Furthermore, if technology improves to the point where it becomes profitable to pursue asteroid mining, corporations will definitely want to stake their claims. While corporations are currently bound by the laws of the country they operate in to maintain safe working environments and protect property rights, there will need to be an entirely new legal structure for space mining. Among other issues, it will need to be decided who has the jurisdiction to impose such laws on a company operating in space. In the beginning, it may be possible to allow corporations to be policed by their home countries, but this could lead to conflicting rules and ownership claims. Also, it is possible that at some point corporations will be operated entirely in space, without a home country on Earth. As businesses are run with the bottom line in mind, it is imperative that there is some kind of enforcement to protect workers and determine which companies have the right to mine a particular site or asteroid. There are also environmental considerations for planetary mining. It will be necessary to protect environments from contamination that may already, or have the potential in the future, to harbour life. Also, it would be unwise to poison habitats that have the potential to sustain human life, since these may be refuges from overpopulation, or environmental or social catastrophe on Earth.

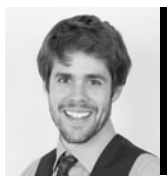
Companies will stake their claims in the same way that they stake claims on Earth - buying up the rights to the land, then mining the subsurface material for valuable ore. But from whom will they buy the rights? First, governments or bodies that legally have the authority to control and regulate the sale and ownership of asteroids, planets, and the like will have to be established. From there, land claims may be made and whole sections can be bought. Such an organization may be responsible for divvying up claims on asteroids, moons, and planets, collecting money for these (eg. to fund other parts of the space program), and mediating disputes between claimants. Then, once mining operations have commenced, another regulatory body will have to ensure that workers rights are protected, workplace policies are met, and environmental regulations are followed. However, the last point is quite controversial since there has been little in the way of research into how these environments operate, or even how they might be affected by human activity. Finally, it may be hard to patrol these areas and enforce laws enacted by regulatory bodies that are so far away. It would be like the wild west before the arrival of the sheriff - people would have to stand up for themselves and their rights.

We don't yet have solutions to these problems, but it may be useful to look to similar instances on Earth to help us understand the societal implication of extending a permanent human presence into space. The colonial period was a time in human history marked by a massive expansion of land ownership and migration of peoples from the old to the new world. It was a time in which the balance of power shifted quickly and decisively between competing European nations. During this time there was also an explosion of human population and thought which helped bring about the democratic and industrial revolutions.

It is likely that the the first colonists of any planet will have either astronaut training or military training and form part of a crew. In such cases, the style of governance follows a specific chain of command that is not democratic. As these societies establish themselves they may continue to be autocratic unless the right conditions exist to foster the democratic process - a literate and educated population, separation of church and state, as well as a decoupling of military and industry influences from the political discourse. Only then may a civilian government be established. However, it's possible that societies of that time may choose a different route to delegate authority than through the democratic process. They may opt for more authoritarian or more egalitarian governments, depending on the needs and size of the society and the available resources.

These are just some of the issues that the colonization of space will create. It will be important to create a system of governance, to arbitrate disputes and protect colonists. Only time can tell what this system will be, and how colonists will choose to govern themselves.

Jobmine, Evaluations, Fundamentals



DEREK THOMPSON
VP EDUCATION

VP Education, reporting for duty! Hey everyone, there are some pretty important changes and updates coming your way and this report should clear many of them up.

First of all, I would like to tell everyone about a very special update coming to Jobmine: an automated email system! In today's Jobmine environment, you have to log on multiple times a day to ensure you don't miss signing up for an interview (especially important during the continuous round as you might get scheduled for an interview at 8 am the next morning). The email system currently in development will inform you when you get selected so you can stop trolling your application or interview page. This update is coming sooner than you might think! If all goes according to plan, B-Soc will have this functionality when they arrive back to campus (which in turn means that A-Soc will be able to take advantage of the new email system next fall). There should be little to no downtime of the Jobmine system required to implement these features.

There is also the possibility of PDF resumes coming to Jobmine, possibly as early as this August. Please be aware that this is currently NOT a promise, but rather something that is more and more likely to come to fruition.

After all this talk about Jobmine, I'll drop this little tidbit: the university is still trying to find a Jobmine replacement. The real issue is that no "off-the-shelf" product or other available system fulfills all of the needs of the University of Waterloo. For this reason, many different solutions are being investigated, including two possible "off-the-shelf" products (which would likely need sizeable custom alterations) and a system currently in use by the University of Ottawa.

There are possible upcoming changes to the co-op evaluation form. Very early steps are being taken to evaluate the evaluation and determine a more comprehensive method of rating students at their co-op jobs. There are steps being taken to allow the individual ratings in the different skills to affect the final evaluation; there would be a connection between how you performed and the final "grade."

Also, do you remember the Co-op fundamentals course you took in first year? I NEED your feedback on what you feel SHOULD be included in this course. I would like feedback from all levels of students, as each of these student groups may have different priorities in what they feel should be learned prior to starting the first co-op job hunt. Current ideas include showing first-years a mock-up of the Jobmine application process, from creating an HTML Resume right through to applying for a job. Please email your comments or ideas to *vpeducation.a@engsoc.uwaterloo.ca*.

Finally, Jobmine's continuous round has begun! Keep checking and applying for jobs as many new ones are posted regularly! Good luck to all of you!

Society News

LEAH ALLEN
PRESIDENT

Hey Engineers,

Hope everyone has recovered from either reading week or midterms last week. I have a couple items to update.

The FEDS Colour Me Educated campaign is still underway. There are donation bins in POETS, the C&D and the Engineering Society office. Also coming up, you can get extra P**5 points for running a charity event in your class that contributes to the FEDS Colour Me Educated campaign.

Happening soon is the POETS Door Design contest. It will basically be a contest to design something for the glass on the outside doors of POETS (facing the foyer). There will be some type of prize for the winner of the contest so all you design-y people out there, look out for this opportunity.

Over the past week, your EngSoc representative(s) for your class should have distributed the Debt-load survey and the EngSoc survey. The Debt-load survey is conducted by the Faculty to determine how much our students are in debt. The EngSoc survey is being conducted by the EngSoc executives to determine how much the Engineering Society is reaching out to the student body. If your class has not completed these surveys yet, please talk to your class reps and tell them to contact me (*president.a@engsoc.uwaterloo.ca*).

Over the past year or so, the Faculty has been hard at work trying to figure out what they want the Faculty of Engineering to look like in 2015. During this process, the Faculty consulted the student body for their input in a series of town halls. Now the report is complete (or almost complete) and the Faculty is looking to introduce it to the students in another town hall event. This event, called "Vision 2015 Launch Town Hall", will be on Wednesday, March 21st at 5:30 PM in RCH 301. The Dean, as well as other professors in the Faculty, will be speaking to the Vision 2015 plan and there will be a question-and-answer period. I am currently working on getting a video stream set up so people can watch the event if they are on their co-op term or are not on campus that night.

Lately, most of my time is being consumed by meetings. Meetings that are coming up in the future are the WEEF Board of Directors meeting, a Joint A-Soc/B-Soc executive meeting, and a Women in Engineering Event that I am speaking at. Other than that, the Examinations and Promotions Committee meeting is coming up soon so I will be having lots of meetings with students in the coming weeks regarding that.

As always, please feel free to contact me if you have any questions/concerns (*president.a@engsoc.uwaterloo.ca*). If you have any spare time, check out my blog at (*http://engsoc.uwaterloo.ca/blog/presa*). ALSO, follow me on twitter (@*engsocaprez*).

Mental Health and Wellness

ANGELA STEWART
VP OPERATIONS

Throughout your time at Waterloo, stress may seem like a prerequisite for engineering courses. Undoubtedly, we are under a lot of pressure. Conflicting messages and social pressures don't help to determine priorities either. Profs and academic advisors tell us that school is the most important. CECS and employers tells us co-op is the most important. Responsibilities and social pressures from friends and family also demand your time and attention. While finding balance in university can be difficult, it's not impossible, and there are a lot of resources on campus to help you.

Counselling Services has trained professionals offering personal, confidential counselling on an individual or group basis. Appointments are made by dropping into their main office in Needles Hall, room 2080, or by calling 888-4567, ext. 32655. A short interview and an intake form is required to better assess your needs before booking an appointment.

Counselling Services also hosts a number of workshops. Topics include stress and anxiety management, exam preparation, and eating disorders. More information can be found at the Counselling Services website, *http://www.adm.uwaterloo.ca/infocs/*.

Health Services is the place to go to keep your mind and body healthy. Not only do Health Services provide urgent/walk-in care, physician appointments, and nutrition counselling, they also provide counsellor appointments and individual counselling. Appointments can be made by calling 519-888-4096 and are available on walk-in basis. Learn more at *http://www.healthservices.uwaterloo.ca/*

The Office for Persons with Disabilities (OPD) promotes the well-being of members of our UW community with disabilities through a variety of support services. An advisor helps develop appropriate academic accommodations. The OPD can help students make arrangements to obtain necessary documentation. If you suspect you have a disability, make an appointment to meet for screening and referral to a qualified professional. Call extension x35082 or visit *http://www.studentservices.uwaterloo.ca/disabilities/* for more information.

There are a number of emergency services if you ever find yourself or a friend in crisis. UW Police are available 24 hours a day at 519-888-4911, as are the Mobile Crisis Team, 519-744-1813. The Crisis Clinic at Grand River Hospital can be reached at 519-742-3611. Distress lines provide confidential, supportive listening at K-W Distress Line, 519-745-1166, and Telecare Distress Line, 519-658-6805.

I hope you've learned a bit more about the success services and resources available at UW. Remember: you can retake a quiz, a course, or even an entire program, but you can't easily have a do-over on your health. University can be the best, most exciting years of your life; let's make sure they're healthy too.

The Engineering Society is dedicated to promoting on-campus resources and act as an advocate within the Faculty for engineering students. The Mental Health Awareness director, Callie Holt, has organised an exciting event that will be sure to get you hot under the collar. Several therapy dogs will be coming to campus on April 4th. The event aims to relieve stress around exam time and give students a useful distraction. If you're finding exams kind of ruff, this event will be sure to give you a new lease on life.

NEM and ESSCO

MICHAEL SELISKE
LISA BELBECK
VP EXTERNALS

There has been tons of stuff going on over the past few weeks and there are way too many to properly cover here. Jump on over to my blog for more details on many of the things I talk about in this report. Our Rube Goldberg machine is finished and the video has been sent to ESSCO for a grand unveiling of the complete machine on March 7th in Toronto at the CN tower. We also had a very successful event at THE MUSEUM in Kitchener to promote National Engineering Month where volunteers talked about engineering and also helped kids build bridges out of K'nex.

I would like to congratulate Krishna Iyer for bringing the National publication of the CFES to Waterloo for the next 3 years. Project Magazine is a bi-annual magazine with stories and articles about our profession and will give Waterloo the opportunity to show off our awesome journalistic abilities to the rest of Canada.

We entered a team into the ESSCO hockey tournament hosted by McMaster and I have been told that everyone had a great time! We also attended a joint event with Guelph the week before reading week in Cambridge, which was fun and helped foster our relationship with other Ontario Engineering Schools. Canstruction is happening on Saturday, March 10th and we have a stellar team and a great design ready to go for this event and I am excited to share the results in the next issue of the paper. I attended an ESSCO teleconference as well with details up on my blog.

That's all for now.

ECIF, Coverall Day, and More

DAVID BIRNBAUM
VP FINANCE

Hello all you beautiful people!

This term is going great! The events are all good, and the people are all good, and the fun is mostly good!

On the money front, the Sponsorship Allocation Committee met this past Sunday to decide on the terms allocations, and it will be getting ratified at meeting 5. It is available on my blog now at *http://engsoc.uwaterloo.ca/blog/vpfina*. Also to note, ECIF application are still open, and we are looking for your input and ideas, so go to the form, *http://engsoc.uwaterloo.ca/services/ecif-application*, and submit them. If you want them to be considered for this term's allocations, you have until March 23rd to submit them.

Congratulations to our two new ECIF A Soc at large members, Kristen Sperduti and Sean Walsh, who will be representing you on the committee for the next year.

Coveralls from coverall day have come in, so if you have not picked them up yet, come to the EngSoc Office whenever you get a chance. This past Novelties fire sale went really well, and we will be having another one on Tuesday March 13th. The deals will be great, and we also have an awesome new t-shirt design that you should all come and check out. Also, don't forget to come and pick up a nice pair of EngSocks!

That is all for now, if you have any questions as always just shoot me an email at *vpfinance.a@engsoc.uwaterloo.ca*

David

Point Vs. Counterpoint

Intellectual property laws are still relevant in modern society.

POINT

ANJALI GOPAL
2T NANOTECHNOLOGY

"Intellectual property rights" is an umbrella term used to cover the broad spectrum of copyright laws, patents, trademarks, and trade secrets. In recent years, laws governing IPRs have come under attack because they apparently inhibit technological development, stifle creativity, and hinder innovation. Many claim that they are, ironically, hindering the very aspects of technological and cultural growth that they were created to protect. However, copyright laws are fundamental to any society that embraces at least some free-market principles. Although there may be a few rare cases where IPRs might have had an undesirable result, for the most part, modern copyright laws are a great framework which aids the development of technology and reinforces cultural expression.

Let's take a look at why the barebones of certain IPRs, such as copyrights and patents, have been so effective and necessary in the modern world. Firstly, copyright laws are essential in allowing artists, creators, and other inventors to receive profit from their works. To be sure, there would be artists and inventors who continue to create regardless of whether or not copyright laws existed. In fact, copyright laws weren't even necessary before the invention of the printing press, until which copying something like a book was so laborious and of such poor quality that it was rarely done. However, with today's peer-to-peer file sharing, the copy and transfer of creative works is so common that without copyright laws, profit would be minimal.

For instance, consider the movie industry in Ghana and Nigeria. Both countries have an extremely high rate of piracy, to the point that copyright laws are essentially useless. While both countries continue to produce movies, the average profits from a new movie in Ghana are approximately $20,000, after which the movie is too widely pirated to sustain any profit. By contrast, the film industry in North America—where copyright laws are considerably stricter—is a multi-billion dollar business, that provides jobs for millions. Without the guarantee of profit that copyright laws provide, how many fresh, bright-eyed producers, writers, or actors would be able to make a living off their passion?

Similarly, patents are also essential in aiding technological development. While copyrights are the protection of reproducing any tangible works, patents shelter ideas. The main type of patent, a "utility patent", usually places any unique methodology or solution under protection from those who wish to use that same unique idea to make a profit. Unlike copyright, which may easily last a century, a patent expires after 20 years, after which anyone is free to use the idea. There are also very strict requirements for patents: an idea needs to be new, creative, and not something that people who have an "ordinary skill" in the field can discover on their own.

The benefits of patents are obvious, though some may use a few choice side-effects—such as the case of patent trolls—as an attempt to debunk the necessity of patents. A patent troll is a business that purchases patents and profits by suing companies who are violating these patent rights. Many claim this is barbaric because patent trolls are profiting from patents without having any attempt to create technology from this idea, or to further improve the idea. However, the existence of patent trolls actually enforces intellectual property rights. These litigation-greedy businesses are the ones who have the money to file a lawsuit against multinational corporations, which many smaller businesses might not be able to afford. As a result, this actually decreases the monopoly multinational corporations have on intellectual property.

There may be some cases where intellectual property rights have actually lead to a perversion of what they stood for, such as the closet YouTuber's dismay when his harmless video was taken down because it included clips from the latest Nicki Minaj song. "If all you care about is poetry from [closet poets] or home videos or open source software from IBM engineers … copyright is not so important," writes Justin Hughes, a Professor of Law at Cardozo Law School, in *The Economist*. "But if you care about films targeted (and financed) for the African-American and gay communities, copyright matters more." Hughes also goes out to point that freedom of expression hasn't been stifled as much as people claim it has, citing the plethora of blogs, personal websites, amateur photography-sharing resources like Flickr and Facebook, which have sprung up in recent years as a means for said self-expression.

True, IPR laws aren't perfect, and true, they could use some improvement. However, it is an erroneous assumption that the general structure of modern IPRs do more harm than good. Let's not forget that without the same type of copyright laws we have now, artists like Nicki Minaj would not have any incentive to record songs in the first place.

Editor's Note:
Point Vs. Counterpoint is a feature meant to stimulate discussion on thought-provoking topics. The views and opinions expressed here do not necessarily reflect those of the authors, *The Iron Warrior*, or the Engineering Society.

COUNTERPOINT

KRISHNA IYER
2T NANOTECHNOLOGY

Evolution of human culture is a key aspect to the progress of mankind. The Oxford Dictionary defines culture as "the arts and other manifestations of human intellectual achievement regarded collectively". Unfortunately, lately, intellectual property rights and laws have become a massive impediment. These days, it has become necessary to spend a lot of money to keep one's self relevant culturally.

The widespread style of art from the Renaissance has influenced the world to an extent measurable even in today's culture. For example, the influence of gothic architecture cannot be overlooked in most European countries and former colonies. If the architects of the Renaissance era copyrighted their styles of cathedrals and royal residences, we would live amidst chaos and confusion with little to no continuity and flow between buildings. If artists were suing others over similarly styled art, there would little to no progress in society as a whole. Early on, copyrights made sense to preserve the livelihood of authors. The idea of copyright protection was first introduced in the Statute of Anne in 1710 by the monarch currently ruling, Queen Anne. By the powers granted in the Statute of Anne, authors were allowed to grant exclusive rights to certain publishers for a short period of time after the publication of the first copy of a book. This is where the term "copyrights" originated.

When colonists moved to new lands, it seemed to be a good idea to implement the doctrines of patent and copyright protection "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." The original length of time for copyright protection was 14 years. This meant that for this period of time, only the copyright holder can profit from the intellectual property. This, however, has since changed. Walt Disney played an instrumental role in lobbying for longer times for copyright protection; the same person who profited massively by using the storyline of classics such as Grimms' Fairy Tales, now wanted protection for his own works. This duration has since been revised. The last revision popularly known as the 1998 Sonny Bono act (that is the Sonny from Sonny and Cher) ensures that the original creator of content is granted copyright for the duration of his lifetime as well as fifty years after his death.

This also applies to patent law. Despite the original intentions to safeguard the hard work and creativity of inventors, patents have now become a convoluted idea. An interesting example is the classic six way D-pad control system. This D-pad was patented by Nintendo in 1985 and lapsed in 2005. This resulted in the excellent controller design displayed by Sony in PlayStation Vita. However, for the past twenty years, we have had to deal with the absolutely dismal D-pads on Xbox 360 and PlayStation 3 controllers. Similarly, the Apple versus Samsung saga in Europe and China is also testimony to the complications caused by patents. The patent buying spree that ensued after the collapse of Nortel is further testimony to how knowledge has become monetized.

Another widely-known side effect of patent law is the existence of patent trolls. Patent trolls are individuals or companies that have income generation solely by acquiring patents and then suing possibly infringers of these patents. This is in complete violation of the spirit of intellectual property preservation. Getting pleasure out of someone else's misfortune is the most sadistic and least human a person can be. The complex nature of patent law has rendered patents as just a game of money and power fought between parties with copious amounts of money (and thus lobbying power).

Getting back to the point about copyright protection, the excessive need to "preserve" copyright protections has spawned censorship acts disguised as copyright protection acts such as SOPA, PIPA, DMCA, ACTA etc. Personal freedoms have been curtailed at the expense of copyright protection. There is total and complete disregard for the principles of "Free Use". Works in public domain is gradually diminishing due to the extended copyright protection. Development of derivative works is adversely affected. For example, Vanilla Ice's usage of the beat produced originally by the British rock band Queen, in their hit single "Ice Ice Baby" was a direct result of the hip-hop era of sampling famous beats. However, it was in violation of copyright laws and was thus penalized heavily. This was a major setback to the golden era of hip-hop. Another such illustration is Andy Warhol's famous painting, "Campbell's Soup Cans". If copyright protection law was enforced in this case, one of the contemporary artists of our times could have been subject to the politics of copyright protection.

These and further examples show the principles of preservation of intellectual property need to be re-evaluated. Principles such as Creative Commons and GNU licensing seem to provide a good alternative to traditional copyright protection. They allow people to gain credit for their work yet not be as restrictive as traditional copyright protection. The movie and recording studios need to recognize the dynamic nature of human culture and the adaption required for the advancement of society.

Engineering Society Events

March 3 - 17

Mon - March 5	Tues - March 6	Wed - March 7	Thurs - March 8	Fri - March 9	Sat - March 10
• Student Faculty Games - *6:00 - 10:00 p.m.* • Running Club - CPH Foyer - *5:00 P.M.* • Iron Warrior Meeting - E2-2349A - *5:30 P.M.*	• Housing 101- POETS - *5:30 - 7 P.M.*	• WEEF AGM - E5 2004 - *4:00 P.M.*	• Running Club - CPH Foyer - *5:00 P.M.* Enginuity - CPH Foyer - *11:30 a.m. - 1:30 p.m.*		• ENG/AHS Semi-Formal Club - 7 p.m. - *1:00 a.m.*
Mon - March 12	**Tues - March 13**	**Wed - March 14**	**Thurs - March 15**	**Fri - March 16**	**Sat - March 17**
• Enginuity - CPH Foyer - *11:30 a.m. - 1:30 p.m.* • Running Club - CPH Foyer - *5:00 P.M.* • Iron Warrior Meeting - E2-2349A - *5:30 P.M.*	• Novelties Fire Sale - CPH Foyer - *11:30 AM*	• Engineering Society Meeting - CPH 3607 - 5:30 - 7:00 p.m. • PI DAY	• Engplay - Tickets in Orifice - 7 p.m. • Running Club - CPH Foyer - *5:00 P.M.*	• Engplay - Tickets in Orifice - 7 p.m	• Curling - 11 a.m. • Engplay - Tickets in Orifice - 7 p.m. • Eng Hockey Tournament - CIF - 11 p.m.

Why High School is Too Easy

Part 1: Problems with the Current System

JOSHUA KALPIN
1B SOFTWARE

When transitioning from high school to university there is a significant change in the way that courses are taught and, as a result, how students learn the subject matter. Course attendance, other than exams and labs, is no longer mandatory and class time is mostly devoted to an instructor lecturing on course material with separate tutorial sessions, instead of having them clumped together on a daily basis. Furthermore, the speed instructors teach material is significantly faster compared to high school. In a span of 3 months, a university course can cover the material of as many as three high school courses and many high schools do not even cover many of the subjects in first-year university.

So what is the point of all of this? There are two problems with the transition from high school to university and with high school itself: its filtering capabilities and its ability to adequately prepare students for post-secondary education.

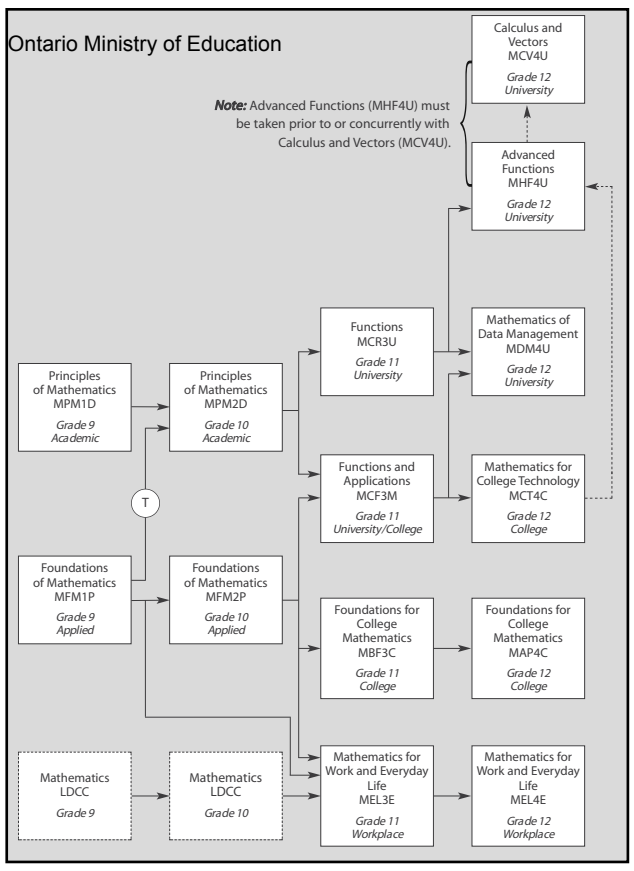
Filtering capability refers to the ability of high school to make sure that students unprepared to enter intensive programs such as Engineering, Mathematics and English are not entering those programs and wasting their time and money. At the same time, the system does not provide enough direction for those students who may not understand what it means to major in Sociology, Mechatronics Engineering, or Knowledge Integration. Moreover, there is too much of a push for every single student to go to university when that is not necessarily the right place for him or her to go.

There are three main areas that we can focus on in regards to providing students with direction: difficulty of classes, availability of classes, and adequate student support. These may sound pretty broad, but each contributes to the core problems that we face.

The first problem area, difficulty of classes, has two components: the amount of material covered in each course and the speed at which said material is covered.

To start, we'll focus on Math. Currently, most high schools follow the basic Ontario Curriculum math courses from grade nine to twelve. This starts with an "Academic" and an "Applied" stream and then branches into "University," "Mixed," "College" and "Workplace." Once a student reaches grade twelve there are three courses offered to those who took grade 11 "University" math (known as Functions): Advanced Functions, Calculus and Vectors (whose prerequisite is Advanced Functions) and Data Management. At first glance, this seems to be a lot of choice; however, the way the material is covered is the problem.

The three major problem courses right now are Functions and its two grade twelve equivalents. In Functions, one learns about characteristics of functions, different types of functions (exponential, polynomial, trigonometric, etc.), sequences and series. In Advanced Functions, one learns even more about functions and learns how to find the instantaneous rate of change without actually doing derivatives.



Current math curriculum flow chart

The problem is that the course really does not have enough material to justify its existence. All trigonometry covered in the course is in radians instead of degrees and there are even more characteristics of functions that manage to appear in this course. To provide perspective, all the material covered in both functions courses was more than covered in approximately 5 weeks in 1A. It is not necessary to have two courses that take up the equivalent of an entire school year to cover material that could easily be condensed into one faster-paced course.

Moving on to the last course, Calculus and Vectors, which focuses on two drastically different (until later in University at least) topics: Calculus and Linear Algebra. This course was the demon spawn when the Ontario government decided that having a dedicated course to Linear Algebra and Discrete Math and only one grade 12 functions course was too difficult on students.

The first half of the course, depending on what school the course is taught, focuses on limits and both implicit and regular derivatives. The problem here is twofold: integrals are not covered and derivatives could have been covered properly in the first place instead of dancing around them in Advanced Functions. Ignoring integrals is similar to showing someone how to add but not subtract. Derivation and integration are inverse operations of each other and are essential to most advanced science and math courses.

The second half of the course focuses on vectors, planes and solving planar intersections using matrices. This material lasts at most a week and a half in a first-year linear algebra course and does not go into any real depth about the important aspects of Linear Algebra, such as matrix multiplication or finding determinants. The other missing area is that discrete math is completely ignored. This is the area of mathematics that most students seem to struggle within first year and avoiding it in high school does nothing but compound the problem.

Next we'll discuss the science courses, Chemistry and Physics. Both of these courses are mandatory for anyone entering engineering, and in many cases are required for entry into sciences as well. Almost all equations in physics are based in calculus and were derived using derivatives and integrals. The problem is that grade 12 physics, which deals with many of the same concepts that are covered in first year, can be taken without having any prior calculus experience. Similarly, important aspects of vectors such as dot product and cross product are also covered in a hand-wavy manner.

Tying this all together, we end up with a series of math-intensive courses that are not intense enough, spend too much time on vague mathematical explanations that could be more direct and spend too much time on concepts that do not need the time. This leads to students entering programs thinking they are really good at physics or calculus and then getting a major reality check after they have written a cheque to the university. Furthermore, this can turn off many students to these disciplines because they find the material is boring or moving too slowly. An unfortunate problem is that this applies to many humanities and social sciences too.

The humanities and social science majors face a slightly different problem. It is not that the courses pile review upon review, but instead they do not provide enough direction for someone trying to figure out what major they should choose when applying to university. As mentioned earlier, many students have no idea what exactly a major is other than from a description on a university website or what a guidance counselor tells them. Most high schools do not offer complete courses in many of the most popular majors at universities and then expect a student to know exactly what they want to do. Moreover, because of the fairly open course requirements to get into these programs, many students are not prepared for the readings and papers required in almost all of these majors. As we can see, this is a major problem.

To summarize, the Ontario high school system currently faces many problems with its ability to adequately direct and prepare students for post-secondary education. Too much time is spent on repeating material, many courses give hand wavy explanations for key mathematical concepts and many times there is no way for a student to figure out if they like a subject because it is not offered.

Now that we've covered problems with high school, questions arise of how we can we make the system better to avoid these problems. Well, that is for the next issue (for the sheer fact that it is equally as long as the problems) but keep in mind that many of these solutions will take complete reforms to the system and in many cases be extremely difficult to implement without a desire for change.

Celebrity Culture: A Media Obsession

KEVIN JOSEPH
2T NANOTEHNOLOGY

Have you ever picked up an issue of "Us Weekly" or "Hello! Magazine" and asked yourself, "Who honestly *reads* this garbage?" The fact is that enough people are reading, writing, and producing gossip magazines, blogs and television shows (E! is an entire network) are being watched thus making celebrity "news" a very lucrative industry. According to *WolframAlpha, perezhilton.com* gets 6.8 million daily page views, and *TMZ.com* 9.3 million. The question of "why?" is still a valid one. Kobe Bryant is an excellent basketball player (with apologies to the haters) but should that spur interest in his marital life? Joseph Gordon-Levitt is a talented actor, but for what possible purpose should the public be informed that he is "real-life" friends with Zooey Deschanel? Why should every politician hoping to have a shot at governance have to have an expensive haircut, be seen at bars, and have funny clips on Youtube (it's worse in the States where you are wise to publish an autobiography, appear on Oprah, and have Chuck Norris or Will.i.am supporting you)?

Although more prevalent in recent times, it should be noted now that this is not an entirely contemporary phenomenon. Oscar Wilde's sexuality was cause for trial and severe scandal. When Charles Dickens visited America for the first time, the fanfare was so great that barbers would try to sell alleged pieces of his hair. In fact, Dickens was so appalled by what he found to be American vulgarity and crassness that it led to a long-standing falling out. Now, the celebrity status of Charles Dickens being more earned than that of Paris Hilton is a valid distinction to make in this case. One problem is the ubiquity of modern media; people are always plugged in and anchors need something to deliver. The fact is that Anderson is going to get viewers by reporting on Kim Kardashian's tweet about the death of Whitney Houston (actually happened). People are capable of gaining celebrity status simply by being famous (reality TV and viral videos come to mind) and the more famous they are, the more interested people seem to be in them.

But this raises the question of who is to blame for garbage media? Is there not a responsibility on the part of media providers to give the public something substantial? To quote Ricky Gervais in the Extras Christmas special, "You can't say, 'Oh, it's exploitation, but it's what the public wants.' No! The Victorian freak show never went away. Now it's called 'Big Brother' or 'American Idol.'" As much as I revere Ricky, the media's obsession with Spears's snatch and Portman's ring is a bit like the story of the scorpion and the frog. For those unfamiliar, the scorpion one day asks the frog the carry him across a pond. The frog says that he would love to, but can't help but fear that the scorpion would sting him. The scorpion points out that doing so would only kill them both. The frog obliges but halfway across the pond, the frog notices a sharp pain. When he asks the scorpion how he could doom them both, the scorpion replies "I couldn't help it. It was in my nature." Media, as an industry, will seek out that which will attract viewers, even at the cost of its own integrity, because it is the nature of the system (this is a good reminder of the importance of state media such as the CBC and BBC).

It is funny that Gervais's character, Andy Millman, should use Big Brother as the platform for his speech since the state of affairs in which people are drowning in trivial and pointless "news" to the point that serious issues such as the global food crisis, epidemic or soldier suicide (a larger killer than enemy combatants for US soldiers) get lost in the noise sounds more like the vision of Aldous Huxley. Huxley said the world will be conquered through apathy and indifference, not oppression and cruelty. I, however, posit that no person or group of people are cultivating this culture; it is rather an ugly mould which has grown organically and lives off of a positive feedback loop between media outlets and consumers. So do yourself a favour and ignore it. Engage people in topics with breadth. Support thought-provoking media. Don't watch *Jersey Shore* or *My Super Sweet Sixteen* "just to laugh at them": this worsens the problem. And keep in mind the immortal words of Eleanor Roosevelt, "Great minds discuss ideas; average minds discuss events; small minds discuss people."

A Socially Responsible Mining Industry

UMAIR MUHAMMAD
4B ENVIRONMENTAL

More than 60 percent of publicly traded mining companies are based in Canada. As many of them have operations in the Global South, their impacts on developing countries should interest all Canadians. In some Southern communities, residents think of a mining company operating nearby, rather than the country, when they hear of 'Canada.'

Large-scale mining has the tendency to be tremendously damaging to the environment, and if proper precautions are not taken this damage can translate into health and social problems for people in nearby communities. While mining companies create jobs and pay royalties and taxes, the benefits provided by these often bypass poor host communities and are captured by politically connected elites. Contamination of drinking water, displacement of communities, heightened risk of conflict, and increased political corruption are some of the problems that find themselves attached to the mining sector.

Dubbing themselves "socially responsible," Canadian mining companies tell us that regulations restricting them from harming vulnerable communities in developing countries are not required. They claim they can abide by high enough ethical and environmental standards without regulation. Our current government takes the same position.

It is likely that most people in the mining sector are "good," and do not wish to take part in unethical behavior. Unfortunately, people's "goodness" is not something we can rely on to make sure vulnerable communities are not harmed or unfairly taken advantage of. There are institutional forces which allow even "good" people working in the sector to contribute to bad conduct.

The first of these forces is competition. It drives companies to cut costs wherever they can to maximize profit margins and stay ahead of other firms. Cutting costs can lead to the thinning of safety and environmental standards, and provide incentive to engage in corruption.

Secondly, there is regulation, which should act as a protective force. Currently, however, regulation in this sector tends to be very weak. Hence, it does not stop companies from cutting costs to such a degree that their operations cause harm to poor communities.

Finally, there are the specialization and hierarchy that exist within companies. Employees generally work on component parts of large projects and are often not aware of the full impact of their work. However, even in a case where an employee is aware of and displeased with impacts, it will be easy for her to justify doing her work. In her mind she will shift responsibility of the negative impacts onto those above her who have assigned her the work. She will likely also note that if she was not doing the work someone else would do it. One or both of these two justifications will work through the minds of all individuals who are not wholly satisfied with foreseeable negative impacts, and the project will go on.

Along with all this, we must remember that proximity breeds loyalty, which can often be blinding. Those who work in the mining sector may become conditioned in such a way that they are not able to see its faults; just as Canadians can easily overlook their country's faults.

As Canadians, we should push our government to regulate the conduct of companies which call Canada their home. As these companies benefit greatly from the patronage they receive from the Canadian state, the Canadian taxpayer is implicated in any wrongful conduct they partake.

Going Grey

LEAH KRISTUFEK
1B CHEMICAL

Back when I was in 2A, we had a guest lecturer in our Introduction to Environmental Assessment course who talked about environmental issues and problems with the environmental assessment process. I don't remember the details but what I do remember is the underlying tone in his presentation – the world is doomed. Basically, his main point was that we are past the point of recovery. We have brought a problem upon ourselves from which there may be no recovery. Leaving that lecture, we all felt kind of depressed about the state of the environmental world, but easily brushed it off and moved on.

But how do we change? Can one piece of recycling at a time really work? My opinion – no. Using bottled water as an example: if you don't buy that bottle of water, then someone else will. So go ahead and do what you can for the environment and feel great about doing it. It doesn't change the fact that the manufacturer who created that bottle is creating millions per day (the world consumes about 200 billion plastic water bottles per year). What about recycling? The truth is that it is simply too expensive to recycle. Most companies would rather create new bottles than recycle them because it's cheaper and easier. After all, in the corporate world, what matters is money, not sustainability. We are living in a corporate world so unless the corporations change, the world can't change.

What's my point? There is nothing we can do to prevent the environmental world from turning into a corporately manufactured world unless we come together as a population – not as a city, or a country, or a continent – as a population. What are the chances? Money rules our world and as long as there is an opportunity for expansion, we will expand and we will continue to do whatever it takes to make money. When it comes down to it, corporations don't care about the environment unless it somehow saves them money or makes them money.

You may be wondering how an environmental engineer can sustain (pun intended) this point of view. After all, this is my life's work, right? The way I see it, there is nothing we can do. There are two key issues:

- The human population is growing rapidly
- The corporate goal is to make money, even if that means choosing the option that is not environmentally sustainable

Since the corporate world controls the environmental world, there is not much we can do as individuals to change it.

The good news? The environment is not passive. Have you ever tried to change the path of a river? It fights to get back to its natural path. That's what the earth will do. It will fight back. It will return to normal in the end. It will bounce back. But will we?

Like I said, the shift from the environmental world into the manufactured world is not going to change unless the corporations change. So educate yourself! Pick a corporation that you're concerned about and do some research of their production methods, their environmental resource strategies, the amount of pollution they create, and so on. If you come across something that doesn't sit right with you, then do something about it! Write letters to them, or tell your friends about it. Knowledge is power. If more people know about the issues, then there is a greater chance that we can start changing!

Now in 3B, I'm not sure if I completely disagree with our guest lecturer. Think about it - we are constantly expanding our manufactured world into the environmental world. The population in 2010 was roughly 6.8 billion people. At our current rate of reproduction, approximately 2.7 children per woman, we will reach a human population of 12 billion by the year 2050. To keep our current living conditions, there is no option but to expand. Eventually, if we don't change, the world will be entirely manufactured. Consider the amount of waste and pollution generated by high-population areas such as Beijing or Los Angeles and then spread it over the entire world.

Living the Suite Life

Rebecca Lalonde Has Found Her Right FIT.

UW HOUSING AND RESIDENCE
SPONSORED ARTICLE

All co-op students are familiar with the housing stress that comes each time they land a new co-op placement - relocating for four months, trying to find a short lease and scrambling to find a subletter. For Rebecca Lalonde, her key to success is living in residence each term, while on co-op or in school.

Rebecca is a 4A student studying Combinatorics and Optimization and is currently on co-op with the Math Faculty Computing Facility at uWaterloo. She is a developer for a program called Maple TA – an online database of math questions designed to assist students with extra questions related to their specific math course.

When Rebecca landed this job she thought, what could be more convenient than living on campus and being a 10 minute walk from work? She has lived in residence since her first year and is now in her 5th term living at Columbia Lake Village-South (Waterloo Residences' townhouse community). Rebecca acknowledges that the conveniences of living on campus have allowed her to succeed in both school and her job. "I spend less time commuting and it's just a short walk to meet up with classmates to work on a group project or to visit a professor if I need extra help."

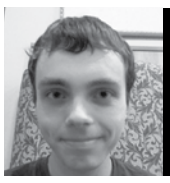
On top of the convenience, Rebecca also loves the community vibe that's created in residence. Every Sunday the students convene in her Don's townhouse to hang out and enjoy homemade treats, freshly baked by her Don that day!

What about the cost? She says it's totally worth it. She doesn't have to deal with the emotions associated with landlords or finding a sublet, dealing with maintenance concerns such as plumbing, or worrying about things like having Internet set up – it's all done for her. She also appreciates the lump sum payment – she pays her fees once and doesn't have to worry about arranging payment with someone every month. For Rebecca, the conveniences outweigh the cost, which, when you break it down, isn't that much different to off campus anyway.

Rebecca encourages other co-op students to explore the possibility of living on campus. Whether you're living there for work or school, you'll experience a strong sense of community tailored to upper-years, independence, and a quality of living that's hard to find off campus.

Rebecca Lalonde

T Cubed: Mountain Lion, Mobile Privacy and Lightbeam



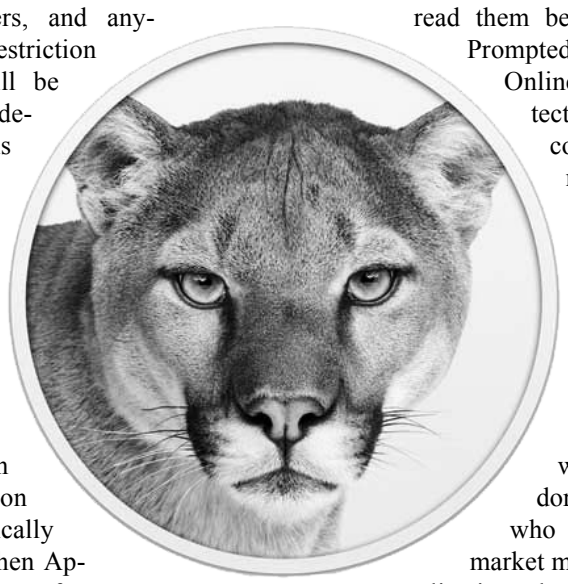
JACOB TERRY
2N NANOTECHNOLOGY

Apple has a history of having a fairly quick release cycle for its Mac OS X releases, but it surprised many this month when it announced its next release, 10.8, would be coming out this summer. Codenamed "Mountain Lion," the new version of Apple's desktop operating system (now called just "OS X") extends many of the same iOS-inspired borrowing started by Lion, in what appears to be a method in helping iOS users transition to the Mac more easily.

Coming over from iOS are Notification Center, AirPlay Mirroring, Game Center, Calendar, Notes, Reminders, and share sheets. Notification Center works much in the same way as on iOS, now using a two-finger swipe from the right edge to show Mac notifications. AirPlay Mirroring allows the Mac to wirelessly share the screen with nearby Apple TV connected TVs, much like on the iPad and iPhone. Game Center connects with the same gaming network that's on iOS, allowing users to play across both platforms. Calendar (iCal's new name to match iOS), Notes and Reminders are pretty much exactly the same as they are on the iPad. Share sheets also work like on iOS, with deep Twitter integration now in OS X as well as other services, including many Chinese services such as Baidu, Youku, QQ and Sina Weibo. In short, everything you know from iOS concerning these features is on the Mac as well.

Also coming from iOS is Messages, a renamed version of the old iChat. It supported most traditional messaging protocols except for MSN, but also includes iMessage support. This application was released as a beta for Lion users as well, so it's had a few more impressions from technology reviewers than most of Mountain Lion's other features. Many users who have iMessage across multiple devices have noted that it doesn't consistently send to all of their devices. This might speak more to Apple's service than to the application, but is definitely something they should look at before releasing the final version alongside Mountain Lion.

The most unique new feature is Gatekeeper, which is a sort of compromise between the locked-down App Store model of iOS and the current free distribution model of OS X and Windows. Gatekeeper gives users three options for where they would like applications to come from: Mac App Store only, Mac App Store and trusted developers, and anywhere. When a restriction is set, users will be prompted to delete applications that don't meet those criteria when they are downloaded or opened. Trusted developers are ones who apply to Apple for a digital certificate on their application that is theoretically tamper-proof. When Apple receives reports from a large number of users claiming that the application is malware, Apple revokes that developer's license and they are no longer trusted, prompting users to delete those applications. This looks like a good method to avoiding another MacDefender incident (malware distributed last year that took advantage of Apple's once-a-day application blacklist by changing its name every day), while still giving users the freedom to install whichever apps they wish outside of the Mac App Store. Hopefully, for OS X, this doesn't indicate a shift to total App Store distribution, as one of the benefits of a desktop operating system is the ability to freely create and distribute.



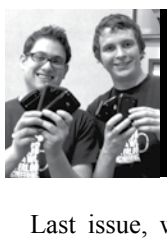
Another topic that has been quite prevalent in the last couple weeks has been privacy, both from web companies and from app developers. After Path was found to be uploading contact information from users of its app and keeping it without informing its users, many questioned the current approach to contact security not only on iOS but across all mobile operating systems. In response, Apple, Microsoft, Google, Microsoft, RIM, Amazon and HP agreed to have developers include their privacy policy alongside their apps so users can read them before purchasing. Prompted by California's Online Privacy Protection Act, each company must make the app's privacy policy clearly visible or linked, and monitor developers for compliance. It's interesting to see how this will affect vendors like Google, who have an open market model for their application downloads. Google pledged to make the needed changes in the next few weeks, so perhaps they've thought of a way to ensure that this policy gets followed. Considering the Path issue stemmed from iOS, Apple also pledged to find a way to update their current system to make it clearer if a user needs to upload its contact information, which is something that Google have developers state before downloading an application on Android.

Google also found themselves in trouble for bypassing Safari and Internet Explorer's privacy settings. The Wall Street Journal reported that Google had placed third-party ad-tracking cookies on Safari users, even though Safari users typically have "block third-party cookies" on by default. To do this, Google found a method to make it look like the user visiting a site had filled out a form which would then get their cookies accepted, effectively allowing Google to track millions of iOS and Mac users through Safari. Microsoft then researched whether Google was doing this to Internet Explorer, and found that although the technique was different, Google had essentially done a similar thing by going around IE's P3P Privacy Protection. For Safari, Google's reasoning for this was because Chrome, Firefox and IE don't block third-party cookies by default, but Safari does, and they claim to have been using this exploit to allow +1 buttons on ads. For IE, Google claimed that Microsoft's P3P technology is out of date and that Facebook and Amazon use similar bypass techniques.

As a final little tidbit, researchers at the Technical University of Darmstadt have been working on a project called LightBeam, which turns any surface into a display, controllable with everyday objects. A pico projector is used for the display, with a webcam being used to track surfaces. In the video they uploaded (viewable at *http://youtu.be/orPc94ZUNwQ*), the user puts a piece of paper, a book, or any sort of object in front of the projector, and it will start to follow that object as it moves, within a small range. The user then puts a mug next to the projected image, and rotates it, which acts as a control for the projected photo gallery to change from displaying Flickr images to Facebook ones. The tangible controls are not limited to mugs, but any sort of rotatable object. Microsoft's Lightspace, which is a similar technology, goes a little farther in allowing people to interact with projections through touch, but perhaps there is more the researchers at Darmstadt have to show when they present this at CHI 2012 in Austin, Texas in May.

Behind the Aperture: Computational Photography

The Future of Imaging?



ANGELO ALAIMO
4B ELECTRICAL
MICHAEL SELISKE
3B COMPUTER

Last issue, we talked about the Image Signal Processor and how its function integrates in the whole imaging system. This week, we diverge from talking about the imaging system and discuss what technological advances have been made which will lead into the future of imaging.

Since the commercialization of digital cameras over a decade ago, the focus of technological advances has been improving image quality. These technological advances came in the form of higher-resolving sensors, before, more recently, shifting to focus on improving the noise performance of image sensors. Higher resolving sensors were the main focus of the megapixel race that dominated consumer imaging products throughout the last ten years. The question of how many megapixels is enough has been asked continuously, and it seems manufacturers are starting to shift away from any substantial increases in sensor resolution.

So where does imaging go from there? Well, even though pixel counts are starting to reach a steady-state, the advances in processing power and other technology has not. Although imaging in the future may appear to be the same on the surface (shoot and display), how one can arrive to a final image may be vastly different. Thus, the future of imaging lies in not only how you capture an image, but also what can be used with the data the image sensor, and perhaps even other sensors captures.

Those within the imaging world call it computational photography, and it's a very recent field of research within academia and industry. It relates to the integration of digital computers with digital cameras. Computational photography may be as simple as augmenting an imaging system with other forms of sensors (to be discussed), to processing the data captured from an image (or multiple images) to form another type of image that could not be formed with a traditional image sensor system.

Augmenting imaging systems with other types of sensor already exists today - for example, integration of a MEMS accelerometer to feed in motion data to an image signal processor to implement a form of video or image shake reduction exists today. This is just one example of an implementation of a sensor/imaging system integration and we'll surely see more pop up in the near future.

On the processing side of computation imaging, one popular form of creating an augmented image from several other images is known today as High Dynamic Range (HDR) imaging. With HDR, usually 3 or more images are taken at varying exposure levels and then blended into a single image. Traditionally, image sensors have a limited dynamic range and cannot capture the full range of bright and dark information within a scene. Taking multiple images at different exposure levels allows the full range of bright and dark information to be captured and blended into a single image. Previously, the capturing and processing of images had to be completed separately on a camera and computer respectively. Since then, the option of created HDR images has been implemented in DSLRs and now more recently - mobile phones.

Computational Photography also helps reduce the amount of hardware needed to capture an image. One example is called "Extended Depth of Field" (EDoF) imaging. It's essentially "digital auto-focus" where information from the captured image can be specially used to make an image from a fixed-focus camera appear to be all in focus almost purely through software. It's not a perfect technology, but it allows auto-focus to be removed from a camera which results smaller and cheaper cameras. Today, this technology is not seen as superior to auto-focus but a significant improvement over simple fixed-focus cameras.

One of the most recent example of computational photography is something called "light-field imaging" where instead of just capturing the intensity values of light like a typical image sensor, the vector of light rays is captured as well. This allows an image to be re-focused in software after it's been captured.

Lastly, at the beginning of this article, I spoke of levelling-off of pixel quantity in the pixel race. Those who are aware of Nokia's recent announcement of a 41 mega-pixel camera phone this past week may be confused by my statement. Nokia's "pureview" imaging system can be seen as computational photography as well. Although the pixel count of the image sensor is very high, it's not about the quantity, it's about how the pixels are used. The pixel size within Nokia's new sensor is comparable to current 8 mp sensors within mobile phones. The novelty with Nokia's high pixel count is that they are used to implement lossless zoom. Packing in zoom optics into a reasonable size acceptable to consumers within a mobile device is a limiting factor and a reason why optical zoom has not taken off in mobile devices. Instead of a low resolution images sensor cropping to a lower, usually useless resolution, Nokia's camera crops to lower, but still high resolution image to implement zoom.

The imaging world is changing at a vastly accelerated pace and we hope we've given you an idea of what has been done on the computation side to date, to give you an example of what the future may hold. Although capturing an image will still be the ultimate goal of photography, how and what we use to reach that goal may be vastly different.

Your First Co-op Term: How to Avoid Cabin-Fever

FARZI YUSUFALI
2T NANOTECHNOLOGY

As you have just experienced firsthand, finding your first co-op job is no walk in the park. Even so, you have managed to secure a co-op job that actually pays (although minimally). Here's the catch: you've got to move away from home and potentially be all alone for four months in a strange place. If the above description is (or will be) the story of your life, then this article is for you.

Cabin fever, as described by Wikipedia, is a "claustrophobic reaction that takes place when a person or group is isolated and/or shut in a small space, with nothing to do, for an extended period. Symptoms include restlessness, irritability, paranoia, irrational frustration with everyday objects, forgetfulness, laughter, excessive sleeping, distrust of anyone they are with, and an urge to go outside even in the rain, snow, dark or hail." Assuming that only a couple of these symptoms are reasonable (who gets irrationally frustrated by objects?!?), your situation is a prime breeding ground for "cabin fever syndrome." Being the helpful person that I am, here are a few tips to keep you from experiencing such urges as "going outside even in the rain."

#1: Find others who have co-op in the same area as you

If you have secured a co-op job at a company, ask whether there are other UW students who have been offered jobs at the company too. If you are working in a remote area with few people around you, having another person from UW can be a great source of comfort when you feel especially lonely without your friends. The added bonus of following this tip is the potential housemate you could get when you get around to looking for housing. Living with someone with whom you have something in common will make your life a whole lot easier and potentially give you a new and lasting friendship. If you are living at home, then don't hesitate to ask your friends where they are working next term and make plans to meet up every three weeks as this will give you something to look forward to.

#2: Find student housing

If you don't know anyone at UW who will be working in the vicinity, look for housing that is specifically geared toward students. Living with a student like yourself (compared to an older professional) makes you more likely to get along with them and potentially create new friendships. This definitely beats peeking out of your bedroom every time you want to go to the bathroom in order to avoid awkward encounters with your housemate.

#3: Make an effort to bond with your colleagues at work

During your first week of work, make an effort to introduce yourself to your colleagues and don't pass up opportunities to bond with your colleagues outside the workplace during "happy hour." While some people are able to walk up to people without any problems, if you're more timid (like me), bring in doughnuts or cookies {editor's note: or a carton of jelly beans on your desk} into the office one day and offer them to your colleagues. This will help you strike up a conversation with your co-workers without having to navigate the always awkward ice-breaking.

#4: Go exploring

For more populous areas, navigate your town or city's website for ideas on what to do during the weekend. Since this is the time where having no company really impacts your mood, don't hesitate to go explore the area you live in. For example, go for a bike ride in the park or take a walk downtown (where applicable) for a bit of window-shopping. This is also a great opportunity to try out different food establishments since you have ample time to find the eatery of choice that will serve as your lunch when you're too lazy to make your own.

#5: Get a gym membership/library card/take a class

Since you have no homework to worry about, you'll have loads of free time as soon as you leave work; this is, therefore, an excellent opportunity to get yourself in shape, catch up on your reading, and/or take a class. Joining the gym is a great way to perk up your mood as you perfect the 8-pack you're currently sporting while reading a good book will fill up the seemingly endless amount of time you have. My personal suggestion would be to take a class. It could be anything from painting to aerobics; keeping your mind occupied while interacting with others that share your interests is another great way to make friends. Taking a class that requires couple or group interaction (like salsa dancing) is even better because this will allow you to relate to each other on a more intimate level.

#6: Skype like there's no tomorrow

If you are essentially living on farmland during your co-op term, your only choice is to keep in touch with people who naturally perk up your mood: your friends. Skyping or calling friends (after adjusting your phone plan for long-distance charges) will give you something to look forward to and will keep you cheerful while you rant about how much your life at co-op sucks.

It should be noted that trying out these tips as soon as possible or as soon as your co-op term starts is key to your success in avoiding cabin-fever. By prolonging the implementation of the tips I've just shared, you are less likely to put them into practice later and will undoubtedly adopt the symptoms associated with this condition. Before you know it, you'll be huddled under your blankets in the middle of a beautiful, sunny Saturday afternoon, unable to get yourself out of this disheartening state. On a fundamental, all humans are social animals therefore, all of the tips above share a common theme: human interaction. Think of all of these tips as ways of increasing the amount of time you spend outside and around others in social situations; rather than following the tips above as strict rules to follow to avoid cabin fever, think of them as practical ideas that can increase your need for social interaction. In any case, whether you follow these tips or not, keeping yourself busy and outside is key to prevent depression and making the best of your co-op situation.

Virtual Communities:

Bridging, Supplementing and Even Superseding Real Ones? (Part One)

ALEXANDER HOGEVEEN RUTTER
4B ELECTRICAL

On February 18th, in the small Kenyan town of Lanet Umoja, Chief Francis Kariuki employed Twitter to send a predawn warning to his community thereby foiling thieves who had broken into a neighbouring house. "Thieves in Kelven's living room, let's help him out please," he tweeted (in the local language).

Though most residents do not have access to internet, the tweets are received as free text messages by many residents of the community. With so many followers, Twitter has replaced fliers and other forms of official messaging for this community including announcements for town meetings, bazaars, and the like.

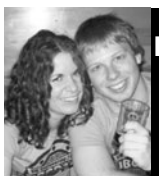
Many companies and organizations use Twitter and other social messaging tools to comment on issues, make announcements, and launch promotions. It is not unusual for social media to be the first source for major announcements in the lives of celebrities and companies, such as new contracts, resignations or expansions.

However, social media and the internet are no longer confined to commercial and personal affairs, but governmental matters as well. As this paper has reported previously, social media played an instrumental role in the Arab revolution and Occupy Protests, not only in organizing protests and coordinating efforts, but in communicating platforms and ideas. On January 19th, many websites, including Wikipedia and Reddit blacked out in opposition to SOPA, a major factor behind the reversal of many lawmakers' decisions and its subsequent postponement. Online hacktivist-group *Anonymous* frequently targets those who seek to oppress, such as those who seek to prosecute Julian Assange, founder of Wikileaks. Here in Canada, anonymous twitterer Vikileaks shared intimate details of Justice Minister Vic Toews's personal life to draw attention to the threat of the recent Conservative motion to enforce governmental spying on citizens without a warrant. Each of these examples illustrates how the internet is being used to shape and direct real-world politics.

However, internet politics is quickly moving out of the fringe domain. In 2010, the Republican Party launched YouCut, an online platform for ordinary Americans to vote on which agencies and programs they think are most wasteful and should be cut. On the flip side, the Obama administration launched WeThePeople, a site which allows individuals to petition the government for changes in policy or legislation. Any petition that reaches 5000 signatures will be reviewed by the administration for feasibility. While it is unclear how seriously these initiatives are taken at the moment, both these moves shed insight into what the future of politics might look like. Imagine a future, where instead of internet groups having to use hacking to make their voices heard, online voices are encouraged and acted upon.

While individual actions can be quite effective, true power of online governance will only occur when online communities are coordinated enough to rival the influence of existing special interests. It is well-known that even a small number of individuals, when united in (for example) seniors groups or unions, can impact the political process. Online organizations such as *Avaaz* form a virtual lobbying group - their efforts attempt to shame politicians or industrial figures by gathering resources from all those with a vested interest (eg. in climate change) and targeting those with the influence (eg. countries which are laggards in acting). Next week's issue will look at how such communities will continue to develop and how they may supersede our traditional institutions.

Beer Buzz: The Beer Community and a True Canadian Brew



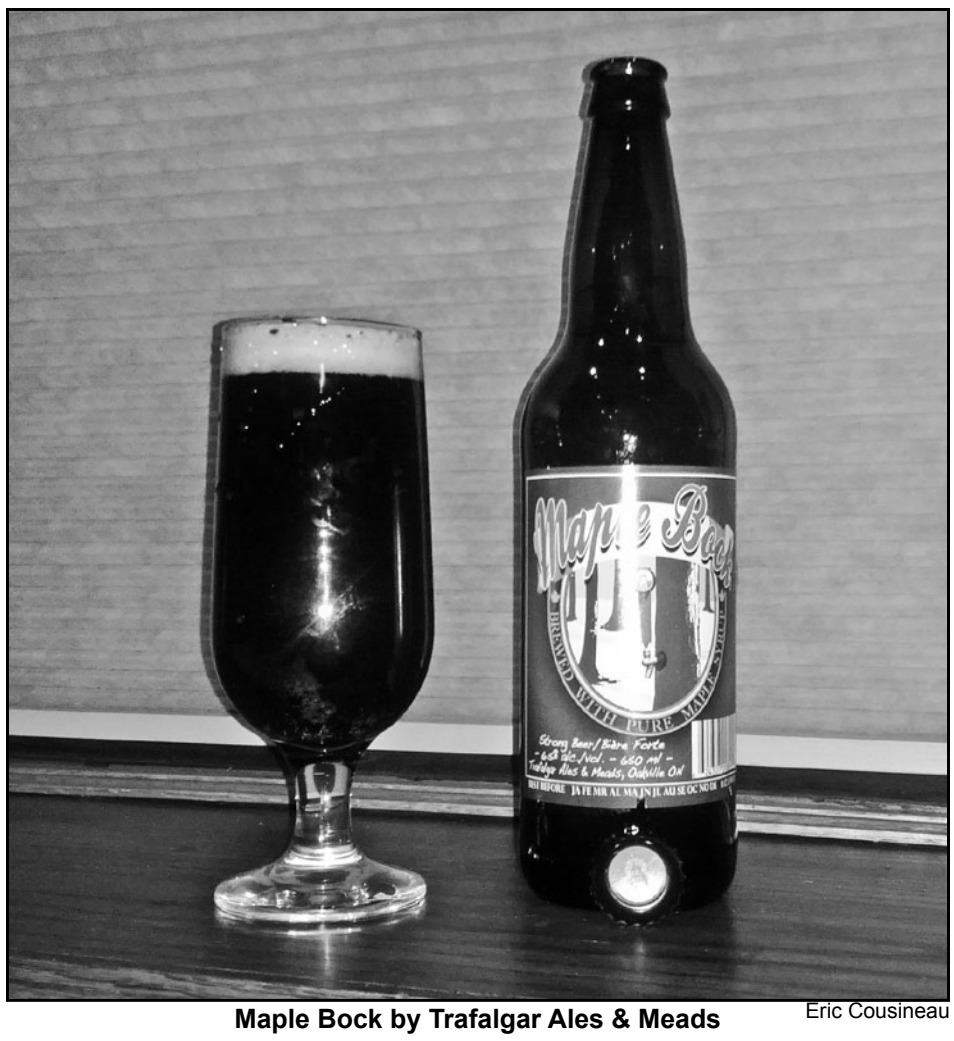
REBECCA CAMERON
4B GEOLOGICAL
ERIC COUSINEAU
4B ELECTRICAL

Hello beloved readers. We hope your midterms are well behind you and you're ready to learn about the world of beer (from us) for the second last time. A reminder to you beer lovers out there, we will not be continuing this column into the summer term (we're graduating!) so there is a vacancy for new beer columnists. It's a great opportunity to learn more about beer since you get to do research and learn new things as you go. Also, it's a great excuse to drink on a weeknight! If interested please send an email to *theironwarrior@gmail.com*.

This article, we'll take less of a technical/historical approach and talk about the world community of beer lovers and the ways one can get involved and learn about what's out there. There are several good beer forums on the internet with large communities and tons of contributors. *BeerAdvocate.com* and *RateBeer.com* are both websites where any beer lover can publish a review and rating of a beer. The average rating is calculated and can be used to judge the overall quality/popularity of a beer. These sites also have general information articles.

There are also a few good subreddits (on reddit.com) that focus on sharing information about beer. Our two favourites are r/beer where people engage in discussions about beer and breweries and r/beerporn where people post drool worthy photos of beers. We've discovered a ton of beer we would like to one day try through these subreddits, it's a great resource for those looking to discover new beers in their area (though still mostly American beers).

There are beer festivals hosted everywhere (usually in the summer) where new beers can be discovered, the most notable to us is the Toronto Beer Festival which will be running July 27th to 29th. There is also the Kitchener Beer and Rib Festival which has a smaller subset of the brewers present at the Toronto Beer Festival. If you haven't been to a beer festival before, you're missing out!



Maple Bock by Trafalgar Ales & Meads Eric Cousineau

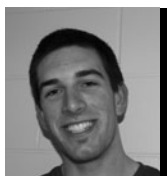
For the truly adventurous and creative there is an entire world of beer called homebrewing. In this world anything is possible and you can make any beer you can imagine (after a bit of practice). It's not as complicated or expensive as one might think since there is a very supportive community accessible online. This is something that we will be starting in the near future.

If you are interested in some formal training and certification there are two main paths you can take. The first is the Cicerone Certification Program (*cicerone.org*) which is the equivalent to the wine sommelier program. It mainly serves to certify people to help guide customers in selecting beer and food pairing, to create beer lists for restaurants, and to generally become more knowledgeable in beer style and tastes. There is also the Beer Judge Certification Program (bjcp.org) which focuses more on tasting and judging beer at competitions. These judges deal more with brewers (and homebrewers) than with customers in a bar.

Today we are reviewing Maple Bock by Trafalgar Ales & Meads (*alesandmeads.com*) in Oakville. Trafalgar is one of those Ontario Craft Brewers you rarely hear about, and this is probably one of the first beers we've had from them. Our research shows that this beer has been around for a few years now, but it seems to us that the beer was recently revamped with a new label and possibly an improved recipe. We got it in a 650 mL bottle at 6.5% ABV. The bottle says it is brewed with pure maple syrup and label depicts a beer tap attached to a maple tree. The beer pours a dark brown with hints of red, and a vigorous pour yielded a generous amount of head. The aroma of the beer is dominated by maple and some sweet malts. The tasting begins with toasted malts and quickly gives way to an intense maple flavour which Eric found to be quite enjoyable and unique. This maple flavour makes the beer very savoury since the flavour lingers a long time in the mouth. The mouthfeel is medium bodied with a good amount of carbonation. Overall this beer has a rather intense maple flavour, which may not appreciated by everyone. However those that enjoy maple flavoured products (like Eric) will find the beer to be enjoyable.

Thanks for reading, we hope you've learned something about the active and vibrant beer communities out there. If you have any questions or comments don't be afraid to stop us in the halls (or computer labs) and let us know. As always, fear no beer!

Colour Blindness



ANDREW MCMAHON
2A ENVIRONMENTAL

Colour blindness is a false term; there is no actual blindness involved. Instead, colour blindness describes a deficiency in the way an individual sees colour or colour differences. This deficiency occurs thanks to underdeveloped retinal cones responsible for perceiving colour in light and relaying that information to the optic nerve.

An Englishman by the name of John Dalton published a paper on the topic after realizing that he himself was colour blind back in 1798; this was the first formal publication on the topic after which some people adopted the term "Daltonism" to describe the condition.

8 percent of Males and only 0.5 percent of females are colour blind in some way. This is because colour blindness is inherited through a mutation in the X chromosome which carries many of the genes related to vision. Colour blindness is so rare in females because as long as one of the X chromosomes is normally coded, then vision will be normal, whereas males, who have only one X chromosome, will be colour blind if it is defective. A father cannot pass on colour blindness to his son because he does not contribute an X chromosome; however, a man may have a daughter with a defective X chromosome (who is just a carrier because her other one is normal) and then pass on the defective X chromosome to her son (who will then be colour blind).

There has been research conducted which has concluded that colour blind individuals possess a heightened ability to see through colour camouflages which is said to explain the evolutionary aspect of why so many people are red-green colour blind.

Being colour blind may limit one's career choice where the most talked about instance of this involves flying planes. A pilot has a lot of responsibility and almost all of the controls they use to fly a plane work with some sort of colour-coded signal. While there are careers like being a pilot that cannot be legally pursued, there are other occupations that should be avoided for practical reasons; for instance, operating a paint mixer or being an electrician, which involves identifying resistors based on their band colours, would not be advisable. This condition also creeps into daily life in almost everything, from purchasing clothes to trying to tell if the meat you just cooked is still pink in the middle. Driving also has the potential to be challenging when you consider the many colours of road signs and, most notably, the lights at intersections. Actually, in Romania they don't allow people who are colour blind to get their driver's license.

In summary, colour blind individuals do not see in black and white and the most annoying question that someone can ask them is "what colour is this?"

Engineering and the World

Applied Health Science

LEAH KRISTUFEK
1B CHEMICAL

Applied Health Sciences often gets a pretty hard rap from the rest of the faculties due to its association with Rec and Leisure. We all think that they have it easy: some of their classes are actually gym right? In fact, AHS students are the perfect people to get to know, but not necessarily because they know where to find a good party. Applied Health Sciences prepares students for fulfilling careers helping other people. Many medical practitioners, physiotherapists and other sorts of useful practitioners come out of AHS to save us from ourselves...and our unhealthy habits.

Bio/native habitat/lifestyle: The anatomically correct walk of that student in front of you is probably not entirely the result of genetics. With dozens of classes on how to straighten your spine, properly orient your gait and prolong the effectiveness of your brain through healthy habits, AHS students have been scared into robot-like adherence to good health. If you thought anti-smoking campaigns got grizzly: think again. The ways a body can become deformed are limitless. AHS students are always getting the right kinds of food, the right amounts of exercise and the right kinds of extracurriculars for their future job applications. They can be found taking some quality time for themselves playing sports, eating nice meals with friends and enjoying their extracurriculars, including countless program-specific powwows to keep themselves on track. You may occasionally find these students out on the town enjoying life before they head in to the more intense regime of medical schools and private practices, or perhaps even event planning or the horrors of being a high school gym teacher (for the last two, I have to admit, Rec and Leisure does exist, and they enjoy more 'eventful' future careers). For the most part, AHS students are quietly going about their own business, overachieving at everything they set out to do.

How we interact: When we begin to crack under the stress of our fast-paced lives it will be these students who can help us. Even now there is a higher interest in having general lifesaving skills for AHS than other faculties. In fact, the pace of our lives will be just about perfectly matched-each getting minimal amounts of sleep, which is perhaps why AHS and engineering have a joint semi.

Common areas of interest: Not math, as AHS is perfect for those who hate math because very minimal math courses are required; if you want to talk math, go find a mathie. We do, however, share a general interest in maximizing efficiency: us of various engineering processes; them of the human body.

Verdict: AHS has us covered for all our health and wellness needs.

Bad Movie Review

Movies That Think They Can Get Away With Nothing but Nice Special Effects

MICHAEL NEW
4B CIVIL

So, the 84th Oscars rolled around on Sunday and as I settled down with a couple bottles of wine and a big plate of nachos to watch what dresses my favourite actresses were wearing this year (just kidding, I was checking out how much cleavage they were showing… J Lo won), I was reminded of what a good movie should be. A good movie should make me feel something inside, should dazzle me with its visuals, should make me think, should tell a good story, and should surprise me. I have seen a shift in my lifetime from an emphasis on story and character to a one that focuses on special effects and marketing. It's even more painful for me to watch a movie with a huge budget that sucks more than a bad B movie with almost no budget at all. I feel like it's just such a huge waste of all that time and effort. I like art and I doodle and paint a lot in my spare time so I actually have a big appreciation for the amount of work put in to do these visuals. But after countless CGI driven films, even I am getting bored. Nowadays, anyone can do CGI. Give me story!

Transformers: Dark of the Moon (2011) was up for 3 Oscars. Uuuuuuuugh. What an awful movie! I went to go see it in theatres with some friends and fell asleep half way through because I got bored. This was the second movie in my lifetime I ever fell asleep at in a theatre. The first one was actually *Armageddon (1998)*, and that was because I was at a movie marathon and had gone 48 hours without sleep. Here is a perfect example of a movie where the entire budget was spent on the visuals and the advertisement and nothing was spent on story. Plot?! What plot? Robots! Shia LaBeouf! Explosions! Hot babes! Shia LaBeouf! This was one of the most poorly written stupid films I have ever seen. I don't know why Michael Bay (and many other movie makers) won't realize that special effects and advertisements can only take you so far. By spending an extra few hundred thousand on some good writers you can make a far better film that more people will go see. On a side note, Shia is actually not such a bad actor but has picked some real stinkers in recent years. Case in point: *Indiana Jones and the Kingdom of the Crystal Skull (2008)*. Siiigh. Why not have Indiana Jones marry an ewok while you're at it? It's not like you can shamelessly exploit him anymore anyway.

Since the first uses of CGI in films, which was around 1991 when the awesomeness that was *Terminator 2: Judgement Day* hit the big screens, I have seen more and more Transformers-type movies roll into theatres. My personal pick for the biggest waste of money would be *Spiderman 3 (2007)*. Why do I hate thee? Let me count the ways:

SPOILER ALERT!

1) That dumbass butler who didn't tell Harry about his father's death being self-induced until Harry had blown off half his face trying to kill his best friend.

2) Emo Peter , and his stupid dance routine.

3) Eric Foreman as Venom.

4) Giving Venom about 5 minutes of screen time.

5) F(*&#)ing up the relationship between Peter and Mary Jane.

6) Conveniently changing the whole backstory on how Peter's uncle met his demise.

7) Spiderman forgives the Sandman instead of kicking his ass for killing his uncle. OK. What about the 300 other people he killed?

8) They spent $258 million on this piece of crap.

Runners up for complete wastes of time and money (in terms of CGI) include: Jar Jar Binks, the Twilight movies (fans would have watched it even if the werewolves were sock puppets), and cleaning up the wrinkles on the 4 screaming harpies in the Sex and the City films.

In conclusion, special effects should not make a movie. They should be used to accentuate one. It's possible to have a good story and have the effects blend into the story. There are some big budget CGI movies that managed to do this. If you haven't seen them yet, check out: *The Matrix (1999), The Lord of the Rings (2001-2003), Jurassic Park (1993), Minority Report (2002), Watchmen (2009), Pans Labyrinth (2006), Avatar (2009),* and *Terminator 2: Judgement Day (1991)*.

P.S. *John Carter*, a movie based on the *Princess of Mars* by Edgar Rice Burroughs (author of Tarzan) comes out this year. The ads are freaking cool but had me extremely skeptical of the film as it comes across as one of the type I have been ranting about. And then I found out it was being released by Disney and had been directed by Andrew Stanton, the guy who wrote and directed *Finding Nemo (2003)* and *WALL-E (2008),* two of the best movies ever. I'm so totally going to see this! Please don't disappoint me!

Topz (With a Z)

Top Clothing to Keep You Warm

WADE WILSON
EDWARD BLAKE
2Z HANDSOMENESS

With what will undoubtedly go down as one of Canada's coldest and most bitter of winters, 2012 is off to a rocky start. Now we know you readers out there want to beat Old Man Winter with a sack of Russet potatoes, but the best way to combat her is with warm clothing. This has inspired the guide to top articles of clothing that can keep you warm this winter!

Pullovers: Pullovers are an effective type of sweater for keeping you warm. They are called pullovers because you *pull* them *over* you. I (Edward) have a blue pullover that I wear sometimes when it's cold out, but not cold enough for a jacket. If it is even colder than jacket-only weather then I will wear my pullover under my jacket. If you wanted, you could call it a "pulloverunder." But that would be unnecessarily verbose.

Hats: Hats keep your head warm. In America they call toques "beanies." Beanie babies were a popular collectors' item in the nineties. Sometimes hats have poof-balls or ear-flaps, but sometimes they don't.

Jackets: Some people may say that jackets are old-fashioned.

Mittens: Mittens are like gloves except that the four fingers are melded into one. If you only had one enormous finger and one thumb on each hand then mittens would be gloves, but you probably don't so they probably aren't to you. You can wear mittens and pretend to be a seal or penguin, but that wouldn't make much sense because a mittened arm does not resemble a flipper or wing.

Boots: Boots go on your feet. You can put them elsewhere but they wouldn't fit as well. Boots can keep your feet dry and warm because snow is wet and cold. Sometimes when you wear boots outdoors, you have to wear indoor shoes when you are indoors. When the weather gets warmer indoor shoes just become shoes. In America, they wear shoes inside their own homes, except for Americans who don't; they do not wear shoes inside their own homes.

Scarves: Scarves are pieces of fabric that you tie around your neck. There are different ways to tie a scarf. A scarf can be many different colours: black, grey, red, dark red, blue, green, yellow, orange, violet, purple, indigo, salmon, coral, hot pink, seafoam green, brown, shale, turquoise or mustard.

Zip-up Hoodies: Zip-up hoodies are like pullovers except that you *zip* them *up* and they have *hoods*. When you wear a zip-up hoodie there are three levels of warmth: no hoodie, zipped-down hoodie and zipped-up hoodie.

Cardigans: Cardigans can be worn by lots of people. If you put shoulder pads on your cardigans you can get tenure at a University. Cardigans have buttons.

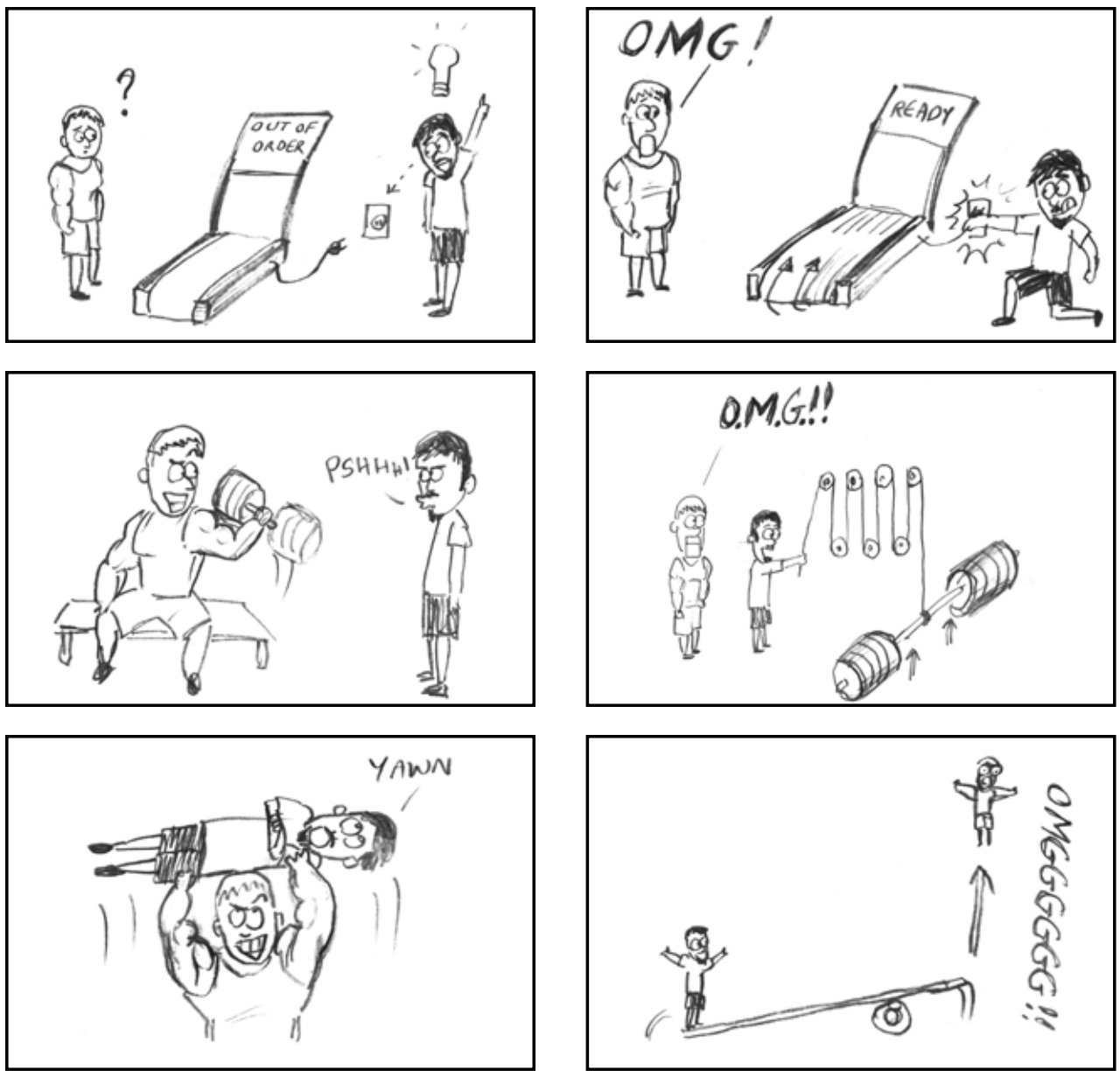
Ski-Masks: Ski masks are worn when skiing and when robbing banks. It is ill-advised to perform both activities at once, even if wearing two ski-masks. This is why Swiss banks are so valued.

Beards: Beards are like organic clothing. Men, grow a beard and it will make your face warmer. Many girls can grow little beards too but do not like to be reminded of this fact.

And there you have it! Our splendiferously well-researched and thorough guide to clothes that will not only keep you warm, but also fashionable this year!

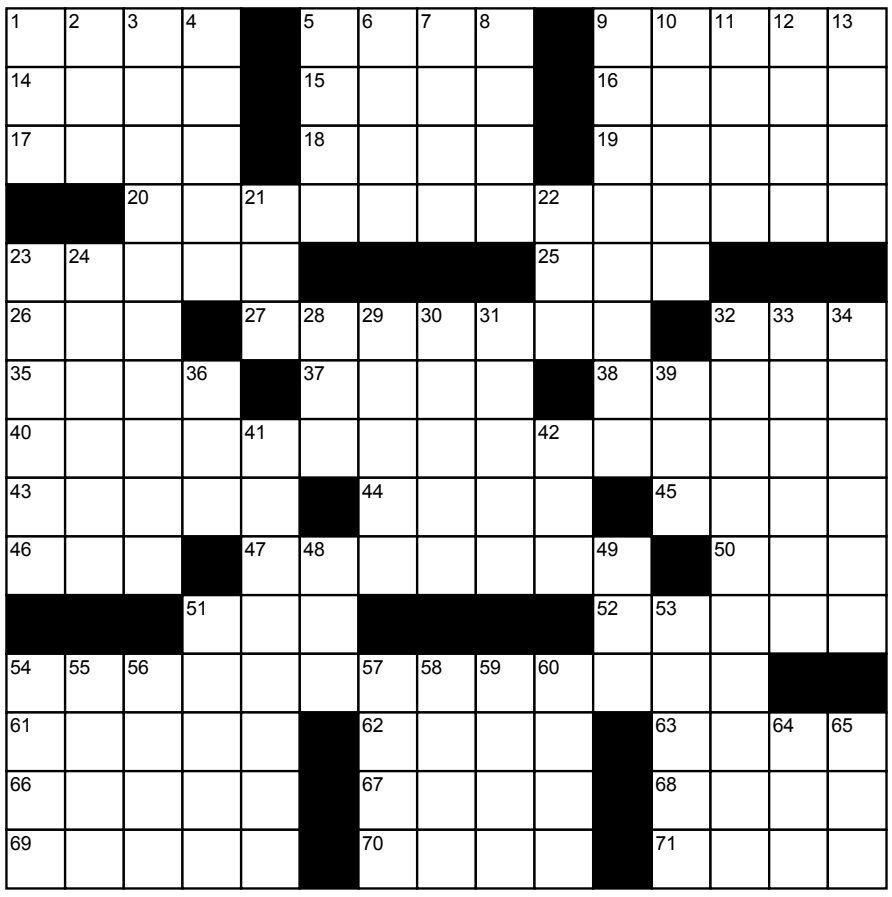
An Engineer at the Gym

Michael New



R & R

STUART LINLEY
2T NANOTECHNOLOGY



ACROSS

1 Eye part
5 Annoying insect
9 Silent, musically
14 Pocket stuff
15 Airy prefix
16 Bond girl Berry
17 Symbol
18 Conversing quality
19 Wipe out
20 Reading week option #1
23 _____-Roman period
25 X
26 Without (of)
27 Gandhi title
32 Pierre coun.
35 Samoan capital
37 Den
38 Plan abbr.
40 Reading week option #2
43 See, e.g.
44 Chai and white
45 Old Testament book
46 Transit north of Toronto, abbr.
47 Fiddle idly
50 Goddess of the dawn
51 Mai ___
52 World, Fr.
54 Reading week option #3
61 Venom
62 Hercules, e.g.
63 Top notch
66 Act part
67 Vissi D'Arte, e.g.
68 Note quality
69 Challenger or Charger
70 Hard-____ (spirits)
71 Paradise

DOWN

1 Sick
2 Brazilian city, for short
3 Component
4 Resilient
5 Portal
6 Clean
7 Chief prefix
8 Carry
9 Not in ___ _____
10 Moses' brother
11 Applaud
12 Ultimatum ender
13 Summer shirts
21 Marcus' wingman
22 High res. microscope
23 Like some knolls
24 Jack epithet
28 Keyboard key
29 Caribbean country
30 Lined up
31 Step
32 Microwave dinner, e.g.
33 Musket attachment
34 Comfortable
36 Sol.
39 Definite article
41 Prisoner
42 Chat room ques.
48 Defeat
49 Ostrich relative
51 Knot skill
53 Speak
54 Vet. mental illness
55 Crazy
56 Cut
57 Object pronoun
58 Zeus' wife
59 Monty Python actor Idle
60 Drench
64 Compass point
65 Even, poetically

S	K	E	W	■	C	H	I	N
I	N	C	A	■	L	I	L	A
B	O	H	R	■	A	D	L	A
■	B	O	N	N	I	E	A	N
■	■	■	■	A	R	R	S	■
R	E	C	I	P	E	S	■	B
U	P	O	N	■	■	■	S	O
L	E	O	N	A	R	D	O	A
E	E	L	■	L	E	N	S	■
■	■	■	P	A	P	A	■	A
A	S	S	U	M	E	■	E	B
R	O	M	E	O	A	N	D	J
I	C	E	R	■	T	I	G	E
S	A	L	T	■	E	N	A	C
E	L	L	O	■	D	A	R	T

■	B	L	A	B	■	■	■	■
■	A	L	S	O	■	■	■	■
■	L	O	I	N	■	■	■	■
C	L	Y	D	E	■	■	■	■
■	R	H	O	D	E	S	■	■
■	I	D	O	L	■	■	■	■
■	M	A	R	■	■	■	■	■
■	K	A	T	E	■	■	■	■
■	■	■	■	■	■	■	■	■
■	A	C	A	D	E	M	Y	■
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
■	B	U	R	N	■	■	■	■
■	I	R	O	N	■	■	■	■
■	D	O	T	E	■	■	■	■

Solutions to Issue 3 crossword

Easy

	9				6	1		
1				5	4			
	6					4		5
	7			1	5	8	2	
3								7
	4	5	8	6			1	
9		1					8	
			5	8				1
		6	2				4	

Medium

			2				5	
3			7					
5		6		9				1
7		4			8		9	5
2		8				4		7
9	6		5			3		2
1				3		5		4
					7			8
	8				1			

Hard

	9	2	4		6			
6	8		3	7				
			2					3
	1	8						4
	6	3				1	5	
4						7	6	
9					2			
				8	4		7	9
			5		9	4	2	

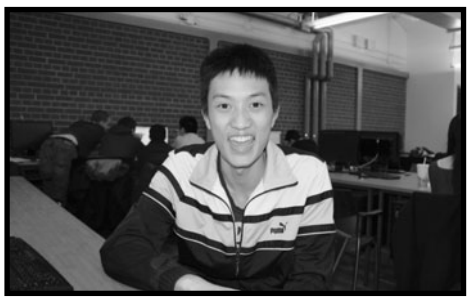
"What happened to winter?"

"Spring has sprung"
Derek Sargen, 3A Electrical

"Billy Murry didn't see his shadow"
Bobby Chen, 3B Computer

"Global warming"
Deeson Patel, 3B Computer

"Winter is coming"
Jason Hadi, 3B Computer



"Whadya mean? In Vancouver, this is winter"
Sherwin Kwan, 2A Mechanical

"Carbon dioxide ate it!"
Mobeen Yousafzai, 3A Civil

THE IRON INQUISITION
Leah Kristufek, 1B Chemical