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The Canadian Government Is Putting Humans First

Mediaplanet recently spoke with the Honourable Joyce Murray, Canada's Minister of Digital Government, to discuss how the federal government is leveraging big data and artificial intelligence (AI) ethically and for the benefit of Canadians.

How does the Government of Canada use AI?

Canada has emerged as a world leader in AI in recent years. As the Minister of Digital Government, I want to make sure that we harness these investments, and the power of AI, to provide better government services to Canadians. Citizen trust is central to this goal.

The Government of Canada uses AI to complement and support the efforts of people. Our approach is to keep humans in the loop when we're using AI. Ultimately, AI in government is one tool we can use to reduce backlogs and processing times while offering convenient, client-centric service.

A great example is a chat bot. Many government websites use a chat bot to answer simple questions so that people don't have to call 1-800-O-Canada. This frees up call centre agents to respond to more specific or complex questions, or to speak with folks who can't use a computer.

We currently don't use the full range of AI technology but it's important to introduce these capabilities now so they're integrated as we accelerate our government-wide digital transformation.

What's being done within the federal government to ensure the ethical development and use of AI tools?

Canada has advocated for a human-centric approach to the development and responsible use of AI, taking into consideration the ethical matters, like openness, transparency, bias, equity of access, safety, and security principles, that are already central to decision-making in the Government of Canada, whether by human or machine.

Canada was the first government in the world to establish a policy on our internal use of AI that puts these guiding principles into practice. As AI becomes an increasing part of our everyday lives, I want Canadians to know that their government is carefully monitoring and evaluating both the benefits and the risks of the use of AI.

Our Directive on Automated Decision-Making helps to shine a light on where government departments are using AI that affects Canadians directly, and ensures that these tools are closely monitored and respects our democratic values including fostering diversity and inclusion.

We're committed to good governance underpinning AI as we shift to a more digitally-enabled government.

How can government leverage big data for the benefit of Canadians?

As we consider post-COVID recovery, we see the opportunity for government to make big data a force multiplier for economic growth and for smart decisions to advancing environment, biodiversity, and climate goals. We recognize the challenges to get there. While Canada produces high-quality data sets, they're not always easy to access in meaningful ways. Just as the U.S. Government's release of topographical data was the foundation for Google Maps, the Government of Canada's data is a potential resource for Canadian AI and intellectual property. We started this journey with open government initiatives and now we're exploring solutions to some of the hurdles to the next step - bilingualism, accessibility, and usable formats. 🔳

To find out more about exploring the future of responsible Al in government, search Digital Government on canada.ca.

Changing the World with Good Tech

Technology is an essential tool. It can be a force to improve the world — but it's all in how we use it. D.F. McCourt

echnology is intermingled with every facet of our | of how we work and think — including an ever-greater | most pressing global challenges.



lives, but is it making the world a better place? Only if we use it properly — and that starts with asking the right questions.

Long-time tech leaders like IBM take the responsibility of stewardship seriously to ensure that technologies new and old are improving the health of people and the planet. They call it Good Tech.

The issues they're tackling are wide-ranging - from global concerns like climate change, hunger, and education to the eminently personal, such as how our private data is managed and the need for guiding ethical principles to govern the use of artificial intelligence (AI).

"Good Tech is at the centre of our values," says Claude Guay, President and General Manager of IBM Canada. "For more than a century, IBM has earned the trust of our clients by responsibly managing their most valuable data, and we're earning the trust of society by ushering powerful technologies like AI into the world responsibly and with clear purpose."

The revolution starts in the classroom and ends everywhere

In the midst of a pandemic that's reshaping every aspect

reliance on technologies - IBM is focusing on how tomorrow's leaders are learning.

Through its Pathways in Technology Early College High Schools (P-TECH) education model, the company provides students an opportunity to fast-track their way to competitive and transformative STEM careers. One of the more recent schools to partner in this global initiative is the Six Nations Polytechnic STEAM Academy in Brantford, ON. "Within six years and at no cost, students can graduate with high school and associate degrees in competitive STEM disciplines, along with a guaranteed job interview with an industry partner," explains Guay.

"We have a collective responsibility toward addressing Canada's skills gap and a tremendous opportunity to prepare Canadians for digital jobs. If we're able to work together to achieve our goals, we can emerge from this crisis stronger than ever," Guay adds.

Nurturing skills in Canada also gives us the tools to plant seeds of progress around the world. The fruits of that labour are seen clearly in the annual Call for Code challenge, of which IBM is a founding partner. This competition seeks creative tech solutions to the

with this year's focus being on climate change and COVID-19. The response has been impressive, with more than 380,000 participants from 79 countries since Call for Code launched in 2018.

IBM runs a parallel Call for Code challenge internally, which was won in 2019 by a team from the Canada Lab in Ottawa. Its innovative app and soil sensor solution,

Claude Guay President & General Manager, IBM Canada

called Liquid Prep, is meant to help low-literacy farmers in developing countries make data-driven decisions about watering their crops with easy-to-use technology.

From the farmer's field to hybrid cloud and AI, the potential for technology to reshape our world in beneficial ways is boundless — so long as we take the reins and ask ourselves: is this Good Tech?



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A SPECIAL INTEREST SECTION BY MEDIAPLANET



Meet ALIIS: The Imaging Technology Disruptor

In the world of artificial intelligence (AI) startups, when you've managed to secure partnerships with three of the world's largest and most innovative semiconductor titans in a little under five months, well — it might just mean that you're onto something. And that's exactly what NexOptic Technology Corp. has managed to do.

Marilyn Brown

eginning this summer, the award-winning Canadian AI innovator NexOptic Technology Corp. caught the attention of Qualcomm, NVIDIA, and Arm, and by late November it had secured esteemed partnerships with all three. With partner support, NexOptic's disruptive imaging AI is OEM-ready on NVIDIA's Jetson and Qualcomm's Snapdragon platforms. Snapdragon is the dominant semiconductor choice worldwide for smartphones.

Leveraging the power of vision

For the world's largest businesses, staying relevant in the world of AI is critical for survival. Industries impacted by AI include automotive, smartphones, Internet of Things (IoT), manufacturing, and logistics. "When it comes to imaging and the future of big business, what their devices can't see could hurt their bottom line," says Paul McKenzie, NexOptic's CEO.

NexOptic's imaging AI, ALIIS, transforms and enhances images using the latest breakthroughs in machine learning. Not only will you be able to take better selfies, but ALIIS is also perfectly tailored to meet the demands of the fastest-growing segments of the imaging industry: machines that capture and process images that no human will ever see. These machines are increasingly leveraging the power of vision to perceive and react to the world around them. Vision systems such as facial recognition, object detection, and classification - can all be paired with ALIIS to enhance their capabilities. This requires lightning-quick and sophisticated AI married with the world's best semiconductors, all to create "a better view."

Incredible picture quality — and opportunities ALIIS works pixel by pixel, whereby every single part

34.78%

of an image is independently and uniquely perfected. The result? Images with superior resolution and sharpness, and dramatically-reduced image noise, glare, and motion blur. Additionally, it enhances long-range image stabilization by enabling faster shutter speeds (up to 600 times) while offering upwards of 10 times reduced file and bandwidth requirements for storage and streaming applications. What's more is that ALIIS does all this in real time. As the next generation of AI-enabled cameras come to market, the opportunity could be enormous.

Headquartered in Vancouver and with recently-opened operations in Seoul, South Korea, NexOptic is a Preferred Partner in the NVIDIA Partner Network, a member of the Arm AI Partner Program, and a member of the Qualcomm Platform Solutions Ecosystem.



Paul McKenzie CFO.

NexOptic Technology



Bill Cawker Corporate & Shareholder Relations, NexOptic Technology

SPOTLIGHT ON ALIIS

- ALIIS is a foundational edge-AI imaging solution
- Learns/embeds the optimal light profile of any camera
- Enhances images and video in real time
- Up to 600x faster shutter speeds
- 10x increased data compression for storage and streaming
- Dramatically reduces image noise, glare, and motion blur
- Improves object detection and image stabilization
- Improves facial recognition, visual SLAM, and segmentation
- Applications in AR/VR, smartphone, security, automotive, and medical sectors



NexOptic Technology Corp.

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Productivity



Intelligent Forestry: Bringing Al Analytics to Forest and Mill

The complexities of the forestry industry are an untapped opportunity for transformative AI analytics. One Canadian company is seizing the moment. D.F. McCourt

ntelligent analytics and artificial intelligence (AI) are revolutionizing efficiency in almost every industrial sector, but not all operations are created equally when it comes to machine learning. The more intricate the workflow, the more robust the AI needed to tackle it, and the greater the rewards of doing so effectively. And it's hard to find workflows more intricate than those on the forestry block.

"Forestry is one of the most complex sectors for analysis," says Andrea Feunekes, CEO of Remsoft. "You're working with a biological asset, so there are a lot of variables that you wouldn't see with hard assets like buildings. There are also concerns like sustainability and the social license to operate, which add complexity that other sectors don't necessarily have. Factor in the low margins the forest industry operates

under and you have a critical need to squeeze out every bit of efficiency possible."

Al sees the forest and the trees

Remsoft has a long history of developing mathematical optimization software for the forestry industry, and in 2021 it'll be bringing its first fully AI-enabled analytics offering to the market, focusing on forest-to-mill operations. "We're always aiming to take the guesswork out of forestry," says Feunekes. "Each company is making literally thousands of small decisions every day that impact productivity. The AI component can pull together disparate pieces of information to provide insights that a human might not recognize."

Whether it's identifying that work on a harvest block is going to be behind schedule well before the workers

themselves realize or revealing the hidden variables driving output volume, AI systems can quickly guide the tweaking of plans and processes for the future. It's the key to better informed decision-making and maximized efficiency in a loop of continuous improvement from the forest to the mill.



Andrea Feunekes CEO. Remsoft

Visit remsoft.com to learn more about the coming Al revolution in forestry

This article was sponsored by Remsoft.

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How to Make the Switch to a Career in Data Science

With competitive salaries, high job satisfaction, and continuous demand for talent, data science has some of the most lucrative careers in the world.

Melissa Vekil

hen Shaohua Zhang looked around the room of 200 university students in his data science class back in 2014, he thought, "Would I actually hire any of them?"

Zhang, who led the data science team at BlackBerry for nearly three years, knew his students were smart and talented but they simply didn't have the experience to be able to succeed in a data science role. The problem was the heavily academic- and theory-focused curriculum.

"Despite being named the 'sexiest job of the 21st century' by the *Harvard Business Review*, the industry was lacking qualified data scientists," says Zhang.

That's why Zhang co-founded WeCloudData, a Toronto-based Institute of Data Science and Technology-accredited college. WeCloudData is uniquely focused on portfolio building and coaching students to complete hands-on projects to differentiate themselves and impress hiring companies.

"Our curriculums are designed to provide students with real-world industry experience," says Zhang, who's also Chief Instructor at WeCloudData.

Led by experienced instructors, students at WeCloud-Data learn cutting-edge technologies like Python, machine learning, and cloud computing. Students are also paired with industry partners to solve real-life business challenges using real data sets. In each course, students complete an end-to-end project they can add to their portfolios.

The WeCloudData difference

Not only does WeCloudData provide hands-on education, it also helps students break into the data

industry thanks to extensive career services. After graduating from the three-month Data Science Bootcamp, students have an additional six months of access to career support including resume review, mock interviews, networking events, and career coaching.

"While most universities provide some sort of career support, the advisors aren't familiar with data science concepts or what employers in the industry are looking for," says Zhang. WeCloud-Data has an impressive 89 percent placement rate at top companies. The college also has a corporate partnership program, offering training and upskilling for entire data science teams.

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To learn more about the Data Science Bootcamp or WeCloudData's new Applied Data Engineering and Applied Business Intelligence diploma programs, visit **weclouddata.com**.

This article was **sponsored** by WeCloudData.



Shaohua Zhang



Karen Lau Co-Founder & CTO, Furnishr



Karen Lau is the Co-Founder and CTO of Furnishr, a turnkey furnishing platform that designs, assembles, and furnishes ready-tomove-in homes.

How does Furnishr use data?

Through designing and building hundreds of rooms, we have a catalogue of data about customer preferences, whether it's colours, fabrics, or materials. Our machine learning platform leverages these insights to predict what kind of custom rooms our customers might want.

Why did you choose WeCloudData to help your business?

We needed help cataloguing our data and building our recommendation engine, and WeCloudData had super smart students who needed experience to build their portfolios. We were given a team of students who developed analysis reports and tools for various Furnishr projects over a semester.

How was working with WeCloudData students?

The students were using the latest tools in the industry, and I was amazed at how quickly they were able to grasp things. Their outputs were very useful in building some of our key capabilities.





Mediaplanet caught up with Herjavec Group CEO and TV personality **Robert Herjavec** to discuss the big data evolution and its implications on cybersecurity for Canadian businesses and consumers.

What initially drew you to working in cybersecurity?

WeCloud Data

In 2003, I founded Herjavec Group by selling the first commercial firewall in Canada. I had a vision of selling a handful to the right IT buyer. At that time, cybersecurity was an IT challenge and a security breach being featured in the news would have been absurd. Since then, we've seen a monumental shift towards what we refer to as a cybercrime epidemic. Herjavec Group has grown to be one of the world's most innovative cybersecurity firms, excelling in large, complex, multi-vendor environments.

What about your work excites you the most right now?

2020 has completely transformed the way businesses operate. Almost overnight, companies were forced to pivot and go completely virtual. Digital transformation is now a requirement for survival and protecting businesses in an ever-changing threat landscape is what motivates me day in and day out.

What's the biggest challenge for the cybersecurity sector in keeping up with the ever-increasing amount of data collected in our world?

Cybersecurity is complex. You can't just focus on protecting small bits of data, you have to look at all the linked components. Ten years ago, a cybersecurity practitioner could focus on something targeted like credit card data, health care data, or sensitive intellectual property and successfully protect these individuals and their information. Today, the cybersecurity industry has to continue to protect these targeted pieces of information, but also focuses on how all of this data comes together and is linked.

These small bits of data, when combined, now represent something much bigger: details like who someone is, what their preferences are, or where they've been. For instance, a person's credit card information might be valuable, but information regarding intimate details about a person or a company are far more interesting to an attacker and also represent much more regulatory risk should that information be disclosed. As more data about everything comes into existence, the burden of protecting that information becomes more difficult and consequential.

With more data being collected and stored than ever before, what protections do consumers have a right to when it comes to how companies safeguard their personal information?

That's a great question and we're seeing some of this being codified into laws such as the Personal Information Protection and Electronic Documents Act (PIPEDA) and EU General Data Protection Regulation (GDPR). In general, the world seems to be wrapping its head around the idea that if a company collects information about a person, that company must consider the risk of harm to that person when designing security controls. Security has to be considered from the beginning and reasonable security controls should be in place based on the sensitivity of the data that's being collected.

Businesses must also afford the person who's the "data subject" some rights, such as the right to be forgotten, the right to ask the organization to correct inaccurate information, and perhaps most fundamentally, the right to know what data the company is collecting and what they intend to do with that information. Consumers expect transparency and they also expect companies to provide due care for their information. Privacy laws like PIPEDA and GDPR are really a way of codifying that expectation and providing appropriate consequences for companies that are negligent.

To learn more about Herjavec Group, visit **herjavecgroup.com**.



Save the World — One Data Insight at a Time

With an estimated 31 million smartphone users in Canada, our mobile devices have become an essential part of our lives. But what if our phones collectively could improve health care, make our cities more efficient, and help manage pandemics? They can, thanks to TELUS Insights.

ELUS powers more than nine million devices on its network, which covers 98 percent of the populated areas of the country. With those millions of devices moving through our towns and cities, there's a massive amount of data that can be used responsibly to provide significant benefits to society.

"Ensuring the privacy and trust of our customers is core to our business," says Pamela Snively, Chief Data and Trust Officer at TELUS. "We knew that we had data that could contribute social benefits to improve the lives of Canadians while providing useful commercial applications, too."

TELUS built a rigorous data governance process and trust model that considers the ethical implications of any data analytics project, and it's the only telecommunications company in Canada to achieve Privacy by Design certification, for its Insights platform.

Demystifying data

TELUS has long analyzed its network data for internal purposes to develop and improve products and services. Now, through its industry-leading TELUS Insights service, it can harness accurate, near real-time data drawn from its network as devices move around and connect to different cellular towers. This data is de-identified and aggregated — meaning that it contains no identifying or personal information and can't be traced back to an individual — and can improve society by helping governments and their agencies, businesses, and non-profit organizations make informed decisions.

"There's tremendous promise in using data to find solutions to some of society's most pressing problems," says Snively. "For example, data analysis could have very positive results for our health care system. It could help us find effective treatments for diseases and also enables us to deliver health care more efficiently. Datadriven decisions will make businesses more efficient, and could enable municipalities to better manage civic infrastructure, including where to build roads and hospitals."

TELUS Insights began as a consulting service to understand an organization's challenges and problems. However, as the program scaled up and more organizations recognized its value, TELUS added an API — a user-friendly computing interface that users can interact with to view dashboards and generate reports.

The launch of Data for Good

Supporting communities across Canada is important

Leveraging the power of near real-time data to create safer communities

According to Jamal, many organizations are using survey data that in some cases is several years old to make decisions on how to spend tens of millions of dollars on infrastructure. TELUS Insights removes decision-making by assumption and replaces it with robust data that's representative of current realities.

For example, the City of Revelstoke, BC was relying on census population data that was several years old and didn't account for the large number of seasonal and temporary residents and visitors who draw upon city services and housing. Data provided by TELUS Insights showed that the city's population in December 2018



Pamela Snively Chief Data & Trust Officer, TELUS



Nadim Jamal Director of TELUS Insights & Smart Cities, TELUS

to TELUS. When the COVID-19 pandemic began, the company recognized it had an immediate — and meaningful — role to play. "We viewed our massive amount of de-identified and aggregated network mobility data as a planeload of N95 masks," says Nadim Jamal, Director of TELUS Insights and Smart Cities. "We have a responsibility to leverage that data, while respecting privacy, to help public health officials and researchers battle the pandemic."

> In April, TELUS launched the Data for Good program, making it possible for health authorities and qualified academic researchers to use de-identified data from TELUS Insights at no charge to measure progress and assess additional opportunities to help stop the spread of COVID-19. TELUS also provides training and ongoing support, and the program has since won a global privacy innovation award.

In the context of the COVID-19 pandemic, public health authorities are using data insights from TELUS to better understand traffic patterns — how people are moving through the city, how far they travel from their home neighbourhoods, and where they congregate. "This allows government and public health officials to measure the effectiveness of public health orders," says Jamal. "COVID-19 has forced the government to adopt new, near real-time solutions in order to answer specific challenges related to the pandemic, such as comparing travel patterns to historic levels and where to deploy resources. It's opened their eyes to the possibilities of how data can be used to help find solutions for other challenges."

peaked at 14,750 — almost double the number from the Canadian

census. For the city to get this near real-time data any other way would have been both expensive and time-consuming.

"Access to the right actionable insights plays a critical role in helping address key issues in our communities, and ultimately can help create safer, more efficient cities," says Jamal.

By way of example, The City of Edmonton, AB wanted to measure average traffic speed through residential neighbourhoods. Instead of spending millions of dollars to place sensors around the city and monitor them, it analyzed insights from TELUS' mobility network to create a baseline on speeds in a particular

We viewed our massive amount of de-identified and aggregated network mobility data as a planeload of N95 masks.

neighbourhood and then compared speeds when limits were changed. This enabled decision-makers to be more precise in its understanding of where policy changes should be made, and whether or not they were having their desired effect.

"Our clients are amazed when they see what the power of our network capability can do. And the infrastructure is already there," says Jamal. "With robust privacy considerations and safeguards in place, data can be used for good. We're just beginning to see the tremendous benefits that smart cities can offer to make our lives better and safer, and one of the critical enablers of this will be analyzing data in a responsible way."

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