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AI is Working: Speech at the Canadian Club in Toronto

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CHECK AGAINST DELIVERY

Thank you for the introduction, and thank you all for being here.

I have to say that it remains amazing to me that I am standing in front of such a great audience talking about the future of AI in Canada. Who would have thought ten years ago that you would have a banker giving a speech on AI? When I think back two years ago to when Tomi Poutanen and Jordan Jacobs approached me asking whether I would help them and a great group of scientists at the University of Toronto to create Vector, I never could have imagined the AI advances the future held for Canada and the world.

Among those advances was the launch of the Pan-Canadian AI Strategy. The centerpiece of the Strategy was the partnership of Canada's three national AI institutes: Vector Institute in Toronto, Amii in Edmonton, and Mila in Montreal. Working together, our institutes would develop and attract the world's best AI talent, expedite the application of AI within Canadian companies and public institutions, and help scale Canadian AI start-ups to become globally competitive firms. Facilitating and funding the institutes is CIFAR, a critical early supporter of AI research and the leader of nationally inclusive AI-related programs including discussion of the social and political issues AI raises.

In the eighteen months or so since the launch, the achievements of our three institutes have been outstanding. At the same time though, the global competition has risen, and we must now turn our attention to what it will take to sustain long-term success and solidify Canada's position as a world leader in AI. This means taking advantage of opportunities to apply the technology, addressing the challenges presented by it, and ensuring that the benefits of AI accrue to Canada and to Canadians.

Let me talk, first, about the creation of Vector, where I had the opportunity to play a small supporting role.

Vector's establishment was a magic moment of collaboration. The Government of Ontario, the Federal Government through CIFAR, businesses large and small, and AI researchers all aligned behind the idea of creating a top AI institute in Toronto and moved quickly to make it happen. Less than two years later, Vector has tripled the size of its founding faculty and has grown into a community of over 240 AI researchers. We have Vector Faculty Members from eight institutions across Canada, from UBC in the West to Dalhousie in the East. Vector's affiliated researchers span another six institutions.

We've also signed sponsorship agreements with over 40 industry partners from across the Canadian economy. On the screen we've put up the names of our sponsors. An impressive and visionary lot. We are determined to make their investment not only the right thing to have done, but a very profitable thing to have done.

When we conceived of Vector, we envisioned creating a high-profile brand that would help recruit and develop a critical mass of top AI minds. This nucleus of top researchers would initiate a virtuous cycle of

talent attraction and investor interest. That, in turn, would lead to a denser AI ecosystem, more knowledge economy jobs, and a rising national competitive advantage. Supply would truly create its own demand.

It didn't take long to start seeing the results. In the last 18 months, we've attracted major companies and investment: Accenture, Etsy, Google, Intel, LG, Microsoft, Nvidia, Samsung, and Uber to name just a few. Among Canadian companies, Thomson Reuters, RBC, TD, Manulife, Shopify, Deloitte, and Linamar have all committed to building AI capacity and acquiring local talent.

The Vector Institute has been among a series of catalysts for over $1 billion of announced AI and tech-related investments, which will result in the creation of 25,000 jobs across Canada.

This growing collection of firms provides many career options for top scientists who may be considering a move to Toronto. I have written elsewhere that some worry that attracting global firms will inhibit the growth of Canadian firms. I won't dwell on this point other than to say that it is extremely hard to imagine that we can build a great ecosystem that has none of the world's largest IT firms. We've been there. It resulted in Canadian graduates heading south because they want to work in those firms. It resulted in a great brain drain.

Today, in contrast, we have a brain gain. CBRE recently reported that Toronto is the largest net gainer of tech talent in North America. It's been an amazing turn around. And it started with talented people coming here and staying here to pursue their careers, whether with foreign-owned firms or Canadian firms and institutions. AI-related investment in Toronto by top tech companies has only strengthened this dynamic.

We'll have the chance later to hear from a panel of AI stars who can talk first hand about Toronto's draw. They are all among the best of the best in the world of AI. They had the option to go anywhere they wanted – and each came to Canada from abroad after deciding that it is the best choice from a worldwide portfolio of opportunities. The panel will be moderated by Dr. Garth Gibson, one of Carnegie Mellon University's top academics, whom Vector repatriated and recruited as CEO after decades in the US.

I say these researchers chose Canada. I've been emphasizing Toronto and Vector's success, but the same talent and investment attraction has been happening in Edmonton and Montreal as well.

Last year, Alphabet's DeepMind set up its first foreign research office in Edmonton citing the deep admiration and respect they have for the Canadian research community.

Microsoft, Facebook, IBM, Thales, and Samsung, among others, have all opened or expanded labs in Montreal. Montreal-based Element AI attracted $135 million in Series A funding, and now employs over 100 PhDs. These investments have led to outstanding researchers relocating to Montreal from abroad, and have given local grads a reason to stay and build their careers there.

At the same time that we've been attracting talent, we've been developing it.

Vector is working with universities to expand master's programs for graduate students with the AI skills that industry has told us they need. We have established a target to graduate 1,000 AI master's students in Ontario each year, and we are fully committed to getting there.

All three institutes are connecting promising students to local internship opportunities. Amii is launching a program this January that connects Alberta STEM students with industry partners. Mila's Professional Masters Program in Machine Learning combines coursework with an internship and daily guidance from a Mila team. Vector is connecting top talent with our industry sponsors at our flagship Job & Data Fairs, the next one of which is in February.

Vector has also launched the Vector Scholarship in Artificial Intelligence — an award granted to the most meritorious AI master's students. Many from the inaugural cohort of scholars are here in the room: 66 of the best and brightest students from 20 different programs across nine Ontario universities. Will the scholars please stand for a round of applause. Today, our sponsors have had an early chance to meet these students who will be in hot demand.

Our experience with these scholarships has been so successful that I am pleased to announce that Vector is making a long-term commitment to extending and expanding the scholarship program. The second round of applications is set to open early in the new year.

Scholarships, internships, and AI master's programs at Ontario universities will be the anchors of Vector's new RAISE AI initiative, which will act as a catalyst for workforce development. I would like to thank the Province of Ontario and Minister Smith for their commitment to this initiative.

We've done well to grow our talent base. But while we've been doing this, the world has not stood still. Indeed Canada's first mover advantage is at risk. The world has determined that economic and political success will depend on a country's ability to adopt AI. I need only quote Vladimir Putin, "The nation which leads in AI will be the ruler of the world."

As a result, nations have bet big. Over 20 countries have announced commitments to AI development, and some are highly ambitious:

- The European Commission intends to invest €1.5 billion by 2020;
- Germany pledged €3 billion by 2025;
- And China plans to be the dominant hub of global AI development by 2030.

The global race for AI supremacy is on.

If we are going to win, we need to do more than just keep the talent machine going. We need to translate that talent into economic and social benefit. There's really only one way to do that: Through leading the world in applying AI. As Kai-fu Lee has said: "Visionary research is no longer the most important element of progress." Practical implementation is now "the name of the game".

The ability to use AI to improve efficiency, to develop new products, and to achieve better outcomes for customers or in public goods is ultimately what will distinguish the national winners. We've grown a base of talent here that can accomplish this. So let's not waste it.

Vector is doing its part. Our researchers are educating people in industry through programs that give sponsors the chance to talk to our scientists about potential use cases and AI issues. Our researchers are also working with partners to apply AI. Consider our work in health care, a sector in which Canada has a data advantage arising from our single payer health systems and our highly diverse population. Together with our health partners, we're establishing secure computing infrastructure to study de-identified province-wide health data. Vector researchers are looking into important differences between diabetes

types – there may be more than just two — and how AI can better predict patients' risks before they need to go to the hospital. Other projects include working with financial services regulators to develop protocols for AI use and working with sponsors to determine ways to tackle important societal issues like combatting fraud and human trafficking.

We need our companies and institutions to experiment with similarly promising applications related to their core businesses. But the truth is, Canada does not always do so well in adopting new techniques. In many domains, we've been great at research, but poor at application. We cannot let this be the case with AI.

Another variable that will influence Canada's success going forward is the degree to which we can foster and keep start-ups that commercialize AI research. Here too we face one of our major shortcomings. The ability to scale firms has been a fundamental economic challenge for Canada for some time.

And helping startups grow is only the first challenge. We can't have our startups scale only to be sold off and have their IP and talent leave to another country — not if we expect to compete in this new leg of the race. Innovation begins in the head office, and the resulting economic benefits accrue to home countries.

If we expect to keep the economic benefits of the talent that we are investing in, then we must create the conditions to grow Canadian firms to be world competitors and incent them to stay here.

This means we need IP policies designed to ensure Canada gets the benefit of its efforts. We need venture capital firms that can go the distance. We need public procurement that's open to smaller firms. And we need to make public data an asset that small firms can access.

Canada needs to mobilize to crack the code of this issue. When that happens, we really could pull away from the pack.

Earlier I said that Vector started as a magic moment of collaboration among many stakeholders. Success going forward now depends on sustained commitments from all of them.

Companies need to begin and continue to aggressively experiment with AI. Like most things in business, figuring out AI isn't about high-level strategies — it's about doing, failing, and redoing until you get it right. There needs to be commitment from the top. Using AI will be a competitive necessity going forward. Every company has to take this seriously, because they can be sure their competitors will.

Companies also have to do better at training their employees. A legitimate worry about AI among the workforce is the destruction of jobs, including white collar jobs. Businesses must be open about the changes underway and find ways to increase the skills of employees so that they see themselves as winners in this shift.

The burden of rethinking work roles and retraining has to be shouldered mostly by companies. Governments can play a role, but companies or public operating groups must take the lead. They are at the coal face and they know what new skills need to be developed. Doing this means understanding what AI can and cannot do, and learning about how AI can take away the drudgery of work and make jobs more meaningful.

Linamar CEO Linda Hasenfratz wrote a great article for the Globe last week describing how AI boosted the company's competitiveness, and how they've actually grown their workforce with "a shift toward jobs that are more interesting and pay more." We should aim to replicate this result across the entire economy.

Legitimate worries about AI also must be addressed. These include the destruction of jobs, the creation of undetectable fake news, the mis-use of personal data or facial recognition software, decision-making tools that reinforce societal biases, cyber warfare. It's scary just to list them.

These issues cannot be wished away. Just saying: "stop the world I want to get off" won't help. Our counterparts will just take advantage of our lack of competitiveness and then job losses will be even higher.

So we have to have thoughtful responses. Once again, Vector can help. Our scientists are citizens too and are acutely aware of the issues. That's why Rich Zemel, Vector's Research Director, devotes his time to finding ways to prevent algorithms from reinforcing biases. It's also why Mila developed the Montreal Declaration for Responsible AI, one of the leading documents guiding the ethical development of AI research and application. But our institutes can't do it alone. We all have to be aware of potential negative applications and guard against them.

For the government's part, Canada needs smart proactive policy regarding AI. There is currently a gap between policymakers and technologists. Policymakers don't really understand the technology. And technologists don't really understand policy. Canada needs to help close that gap. We can't outsource policy development to the rest of the world. We have to be architects of our own destiny and find solutions that reflect our own value systems.

So what do we need? We need well-informed AI policy. We need to continue to invest in education. And we need continued support for our institutes so they can attract top practitioners and their families from around the world. And we need immigration policies that welcome them.

I sense our political leaders understand this. The three institutes have had extensive conversations on these topics with provincial governments and the Government of Canada. They get the need for a long-term strategy, including support for the three institutes and for computing and data infrastructure that supports AI activity. These discussions will be ongoing. They also recognize the need to aggressively deal with the issues around AI if they are to maintain public support for the technology.

Our leaders in Ottawa have specifically underlined their determination to do what is necessary to keep Canada's first mover advantage. That's exactly what we need. We need gritty determination.

I'd like for you to come away from today with a few messages to consider:

There's reason to celebrate what Canada and our institutes have done so far. We've created the conditions for a virtuous cycle of talent attraction, increased investment, and the creation of good paying jobs. Canada is seen as one of the countries leading this technological revolution in the world.

But now many countries are also committed to being leaders in the field. The big powers all see this as critical to the future.

In order to achieve our potential and solidify Canada's place as a leader, we need to make a serious long-term commitment to keeping the talent machine going. We need to commit to applying AI in public and private institutions. We need to commit to cracking the code on how to help our startups become sustainable world-class competitors that remain in Canada. We need to commit to addressing the issues that will become commonplace as AI becomes more widespread. And we need to commit to ensuring that Canadian workers and citizens have the opportunities and security they need and that they truly share in the benefits of AI.

The great news is we have the people to do just that.

Thank you