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# Translating AI science to solve humanity's toughest challenges

In a remote community, safe drinking water often relies on a technician who might only visit once a month. In a busy emergency room, a physician struggles to make eye contact with a patient while frantically typing notes.

These are the types of everyday challenges experts at Amii (Alberta Machine Intelligence Institute) are using artificial intelligence technology to address – and it's making a big difference.

Amii **turns breakthroughs** into meaningful action, deploying responsible technology to benefit our health, environment and communities

"When we think about the societal benefit of AI, it's not only economic impact and productivity," says Stephanie Enders, Amii's chief delivery officer. "It's also about incremental improvements that make our daily lives better."

Ms. Enders says Amii's mandate – AI for good and for all – is a philosophy that moves beyond the theoretical into tangible, human-centric applications. This approach has positioned the Edmonton-based institute – one of three national AI centres– as a steward of responsible innovation.

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The results are already visible in Alberta's health care system. Dr. Ross Mitchell, an Amii research fellow, has developed an "ER scribe" tool that uses large language models (LLMs) to transcribe and structure medical notes during patient consultations.

The primary goal isn't just efficiency; it's also the restoration of the human connection in medicine. By automating the rigorous documentation required by electronic medical records, the system frees doctors to look at their patients rather than their screens.

"It saves them a significant amount of time," Ms. Enders explains. "But more importantly, it means they are looking at a patient during the meeting."


A similar philosophy drives the work of Dr. Patrick Pilarski, another Amii fellow and co-lead at the BLINC Lab (Bionic Limbs for Improved Natural Control). His team uses reinforcement learning – a type of AI that learns through trial and error – to create AI-powered prosthetic limbs that adapt to their users. Instead of a person with limb loss having to learn complex commands to operate a prosthetic arm, the arm learns the user's intent and environment.

The institute's work also extends to environmental and social challenges through the work of Amii fellows Martha and Adam White, co-founders of RL Core. With support from Google's philanthropic arm, the RL Core co-founders, alongside Amii, have proven success that AI can manage key processes within water treatment facilities in remote communities for two-week cycles without human intervention. This achievement offers a valuable lifeline for isolated regions where chronic technician shortages often jeopardize access to clean water.

Meanwhile, Calgary-based ZeroSound collaborated with Amii to bring reinforcement learning to revolutionize industrial safety. Unlike traditional noise cancellation that relies on static averages, their AI-driven panels adjust in real-time to shifting noise. Achieving an approximate 15-decibel reduction in test environment settings, potentially making hazardous environments like factories and busy intersections sound 60 per cent quieter for workers once scaled to larger deployments.

Ms. Enders emphasizes that "AI for all" also means ensuring the technology is safe and inclusive.

To ensure these technologies remain safe, Amii has established a dedicated AI Trust & Safety Team who collaborate with the federal government's new Canadian Artificial Intelligence Safety Institute (CAISI) and fellow national AI institutes Vector and Mila to advance AI safety research and define global standards for safe and secure AI systems.

"Big statements like 'AI for good' can sound ephemeral," she says. "But what I love is that we bring it to a really tangible place."

– STEPHANIE ENDERS

For Ms. Enders, the ultimate measure of success isn't just a smarter algorithm, but a better society.


# Without AI, Canadian productivity will languish

Canada is currently the second least productive country in the G7, according to a December report released by the Government of Canada. The encouraging news is that artificial intelligence can help Canada leapfrog from this position to that of a global leader and help reverse a decade of stagnant growth, securing a higher standard of living and competitiveness.

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How Amii is helping business leaders move past hesitation to build in-house capacity and proprietary AI solutions to boost productivity

To do so, Canadian companies must move from dabbling with ChatGPT and basic AI exploration to the deep integration of proprietary AI. Yet, current adoption rates confirm companies are still hesitant to commit, partially due to the seemingly daunting task of identifying the right use case.

For Marlene McNaughton, chief revenue officer at Amii (Alberta Machine Intelligence Institute) indecision carries a high-opportunity cost.

"The real risk is not getting started," she says. "Working with hundreds of companies, we often see leaders stall, waiting for absolute clarity or the perfect moment, failing to realize that AI is fundamentally iterative. It's not a one-time thing. You start, and you keep going," she adds. "And Amii can be with you all along that adoption curve."

As one of Canada's three national AI institutes, Amii is uniquely able to bridge world-class research into commercial deployment. Canadian businesses can work with Amii to help build the proprietary AI models that have been identified as most urgent, while building internal capacity at the same time.

"We fundamentally de-risk the process for businesses and also build out the critical use cases that will help other Canadian companies see a path forward and legitimate reasons to invest in AI," says Ms. McNaughton.

Companies that take a backseat approach to AI development are more often at risk of 'failure to launch.' By partnering with Amii, companies are presented with a proven and collaborative path to commercializing new offerings and scaling value.

"We don't take your data away and build it into model that you don't know anything about," says Ms. McNaughton. "You work alongside the world's best AI and machine learning experts."

Amii helps companies identify their best AI strategy and roadmap and then also move right into helping them develop their proprietary model with a dedicated team of AI experts – all part of a turnkey seamless approach for clients.

The results of this collaborative, de-risked approach are incredible, says Ms. McNaughton, pointing to the success of Visionstate, a partner that engaged Amii to explore AI enhancements to their core product. By building internal capacity alongside Amii's researchers, Visionstate did more than bolster their core product; they discovered two entirely new commercial offerings.

By providing the strategic roadmap, world-class talent and a proprietary model as a practical outcome, Amii has effectively lowered the barrier to entry for Canadian firms ready to lead in AI.

For Ms. McNaughton, it seems the only remaining hurdle is the decision to begin.

"We fundamentally de-risk the process for businesses and also build out the critical use cases that will help other Canadian companies see a path forward and legitimate reasons to invest in AI"

— MARLENE MCNAUGHTON


# Amii on the essential bridge from AI discovery to impactful adoption

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Imagine a parallel reality where, upon the release of the smartphone, Canadians collectively decided the technology was too risky, complex or unnecessary. While the rest of the world optimized communication and commerce through pocket-sized computers, Canada opted out.

According to Joan Hertz, chair of the board at Amii (Alberta Machine Intelligence Institute), Canada stands on a similar precipice today. "I see other countries advancing faster than Canada because they are willing to embrace AI across industries," says Ms. Hertz. "It is no longer optional for Canada's competitiveness; it is the deciding factor."

> If we use the best tools to produce goods and services, we can positively impact the productivity and affordability challenges currently facing Canadians.
> — CAM LINKE

As one of Canada's three national AI institutes, Amii stands at the forefront of a paradox: Canada leads the world in AI research yet lags its G7 peers in adoption. Despite adoption doubling to 12 per cent in 2025, failing to translate research into practice jeopardizes our prosperity.

This is fundamentally a productivity issue – the measure of how effectively we use our resources. When industries fail to innovate, the resulting "efficiency gap" acts as a silent tax paid by consumers through higher prices and diminished services.

Closing the gap, however, requires considering the full breadth of AI options.

Generative AI, which is brilliant at summarizing data, may not always be the right or complete tool to unlock industrial scale productivity, which often needs ingrained logic and reliable decision-making found in other AI disciplines.

Industrial productivity specifically benefits from the goal-oriented optimization of Reinforcement Learning (RL), a field where Amii is recognized as a global epicentre. This status was recently cemented by the A.M. Turing Award given to their chief scientific advisor Richard S. Sutton for his pivotal work in the field.

This research excellence is the foundation for industry impact. By moving these home-grown innovations from the lab and into the real world, Canada can leverage its most potent economic lever.

Amii CEO Cam Linke notes that the benefits of this transition are clear. "If we use the best tools to produce goods and services, we can positively impact the productivity and affordability challenges currently facing Canadians."

The cost of inaction is already visible. When Canadian companies stall, global competitors fill the void. Ms. Hertz observes that foreign entities often capitalize on Canadian know-how to produce goods at lower costs and higher quality. This erodes Canada's influence within the G7, transitioning the nation from an economic leader to a net consumer of other nations' innovations.

This challenge is most acute for Canadian small and medium enterprises (SMEs), which represent 48 per cent of private-sector GDP. By 2030, AI could unlock $100-billion in annual gains for SMEs, yet these firms often lack "innovation budgets" for experiments. They need a clear line of sight to tangible value.

"We need our AI adoption 'elbows up' to advance our economy. Let's be ambitious."
– JOAN HERTZ

Amii bridges this gap by employing a "stage-gate" approach to de-risk adoption, deconstructing the process into manageable milestones that validate ROI at every step. This pragmatic framework addresses the tension between growth and risk.

Mr. Linke cites a company that scaled operations while maintaining rigorous quality control through an Amii-designed "human-in-the-loop" system. By handling vast quantities of data while flagging complex samples for human review, the AI model enabled experts to stay focused on more strategic work – a tangible example of protecting quality while driving productivity.

Beyond efficiency, AI serves as a democratizing force. Ms. Hertz points to the work of Canadian-born 2025 Nobel Laureate Peter Howitt, who demonstrated that innovation is a more powerful engine of growth than capital accumulation alone. "AI enables small businesses to compete and win," says Ms. Hertz. By lowering the barriers to complex data analysis, AI allows boutique firms to rival major corporations on speed and insight, effectively levelling the playing field.

Ultimately, the most profound impact of this adoption is found in the daily lives of Canadians. In an economy strained by labour shortages and burnout, AI acts as a critical relief valve. By automating the "clerical noise" that bogs down talent, these tools can save the average worker up to 125 hours per year – reclaiming three weeks of productivity annually.

"It makes employees more valuable," says Mr. Linke. "Instead of rote data management, people spend time on the problem solving that drove them to their careers in the first place."

This evolution is perhaps most transformative in its impact on our quality of life, particularly in health care. By shifting the administrative burden to AI tools, clinicians can return their full attention to patient care, restoring the essential human element to one of our most critical services.

"We need our AI adoption 'elbows up' to advance our economy," says Ms. Hertz.

"Let's be ambitious."

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## Talk to the AI Experts at Amii

Book a call