

# Why Artificial Intelligence Giants are Heading North to Montréal



# A world leading economic development agency





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# Top reasons to invest in AI in Greater Montréal



Global leaders, including **Google, Microsoft** and **Meta**, have made Montréal their AI R&D centre



Among the **best student cities** in the world and university capital of Canada



**AI based on ethics and the common good** with the Montréal Declaration and organizations such as OBVIA\*\*



Home of **Scale AI**, Canada's AI supply chain supercluster and **ICEMAI\***



**1<sup>st</sup> in Canada for university research funding** with nearly 2B\$ par year



**Lower operating costs** compared to any other major metropolitan area in Canada and the U.S.



Cutting-edge expertise developed by world-renowned researchers such as **Yoshua Bengio, Joëlle Pineau, Doina Precup, Hugo Larochelle, Irina Rish** and many more!



Close to **900 researchers** MSc, PhD, post-doc and applied AI students at **Mila**, the **world's largest academic research lab in deep learning and reinforcement learning**



Attractive tax credits and incentives for **R&D** and **talent development**



# 01

## A World-Class Artificial Intelligence Hub



# Mila, a thriving AI hub in the Mile-Ex neighborhood

- With close to **900 researchers**, Mila is the **world's largest academic research lab specialized in deep learning and reinforcement learning**
- A collaborative ecosystem of AI researchers, startups and major companies
- Examples of strategic global partners within Mila:



# A unique centre of excellence: IVADO (Institute for Data Valorisation)



More than **1,400** scientists  
(professors, professionals and  
students) with complementary areas of  
expertise

Close to **150**  
members and partners

Over **270**  
collaborative  
research projects

## Research centres



## Network partners



## Academic partners




## International partners



**40+**  
research chairs  
& labs



A portrait of Yoshua Bengio, a middle-aged man with grey hair, wearing a grey and white striped sweater over a black turtleneck. He is standing indoors, leaning against a glass railing.

**YOSHUA BENGIO**  
a pioneer in deep learning

## Montréal's leading AI researchers

- 1<sup>st</sup> in Canada and 2<sup>nd</sup> in the world in the **2021 Top Scientists Ranking for Computer Science & Electronics**
- **Winner of the Turing Award 2018:** “Nobel Prize of computing”
- **Winner of the Killam Prize** in Natural Sciences in 2019
- **Fellow of the Royal Society**
- Full Professor, Department of Computer Science and Operations Research, **Université de Montréal**
- Founder and Scientific Director of **Mila**
- Scientific Director of **IVADO**
- **CIFAR** Fellow and Program Director, Learning in Machines and Brains
- Worked at the CIFAR research institute alongside **Yann LeCun** (now at Meta AI) and **Geoffrey Hinton** (now at Google)





# World-renowned researchers who make Montréal shine



## Joëlle Pineau

Associate Professor with the **School of Computer Science at McGill University** and **CIFAR Senior Fellow**, Program in Learning in Machines and Brains. She is also the Head of the **Meta AI Research lab**, as well as a member of **Mila**



## Doina Precup

Associate Professor with the **School of Computer Science at McGill University** and **CIFAR Senior Fellow**, Program in Learning in Machines and Brains. She is also the Head of the **DeepMind Lab** in Montréal, as well as a member of **Mila**



## Gregory Dudek

Chaired professor of computer science at McGill University and **Director of McGill School of Computer Science**. He is also the Head of the **Samsung AI Center**, as well as a member of **Mila**



## Aaron Courville

Associate Professor in the **Department of Computer Science and Operations Research (DIRO)** at the University de Montréal, and **CIFAR Fellow**, Program in Learning in Machines and Brains. He is also a member of **Mila**



## Simon Lacoste Julien

Associate Professor in the **Department of Computer Science and Operations Research (DIRO)** at the University de Montréal and **CIFAR Fellow**, Program in Learning in Machines and Brains. He is also Director at **Samsung SAIT AI Lab** and a member of **Mila**



## Andrea Lodi

Full Professor at École Polytechnique de Montréal and the **Canada Excellence Research Chair in Data Science for Real-Time Decision-Making**, as well as a member of **Mila**





# Major public investments to support AI development and adoption

**\$93.5M**

from the First Research Excellence Fund (2016)

**\$100M**

over the next 5 years for the creation of a Québec AI cluster (2017)

**\$44M**

for the Pan-Canadian Artificial Intelligence Strategy (2017)

**\$313M**

for Scale AI Supercluster (2018) and for the development of AI talents (2019)

**\$329M**

over the next 5 years to accelerate the adoption of AI in Québec (2019)

**\$15M**

for the International Centre of Expertise in Montréal for the Advancement of Artificial Intelligence (ICEMAI) (2019)



# Montréal is home to many organizations to propel the industry

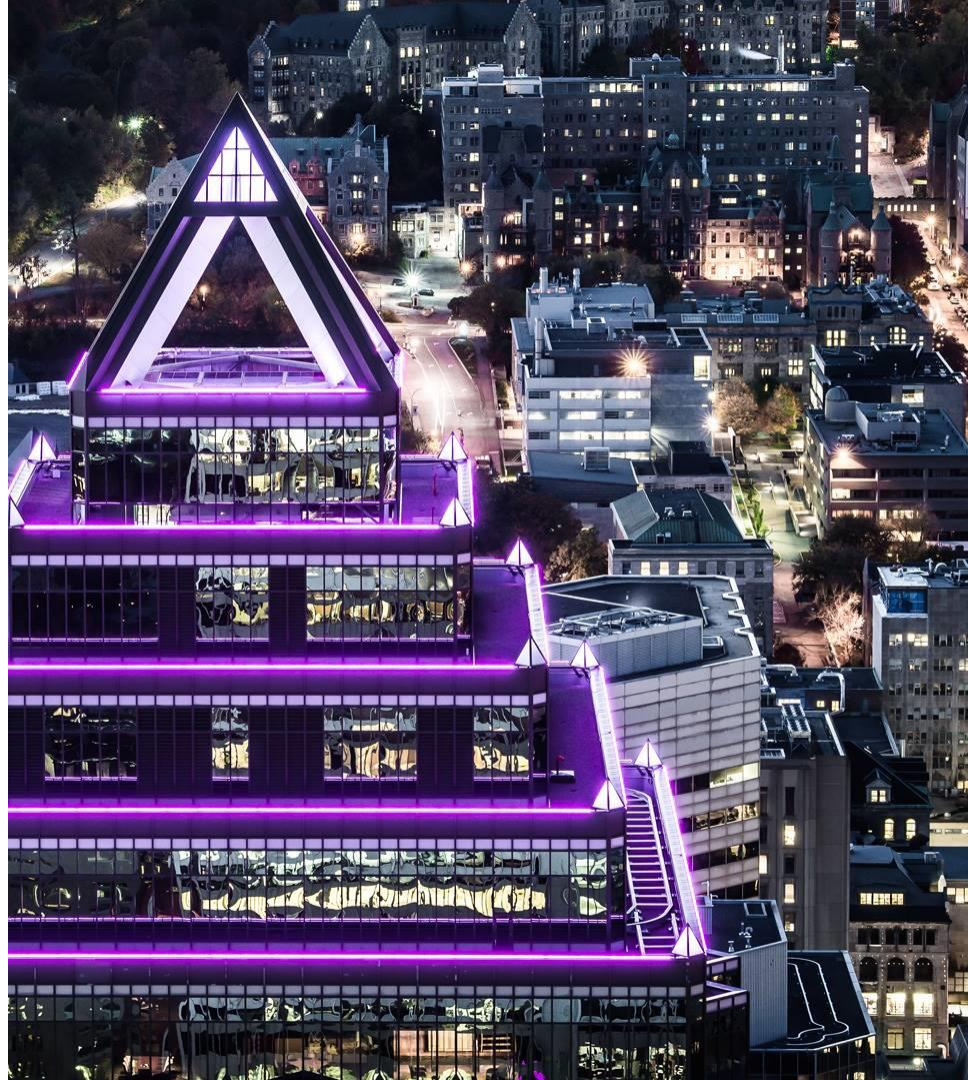
**SCALE AI**

**Canada's AI supply chain supercluster**, dedicated to building the next-generation supply chain and boosting industry performance by leveraging AI technologies



**Québec's AI organization** fostering the development of Québec's AI ecosystem and mobilizing stakeholders in the field around common projects

Examples of other support and funding organizations:







## OBVIA, fostering responsible AI and digital technology

- The **International Observatory on the Societal Impacts of AI and Digital Technology (OBVIA)** helps maximize the positive effects of AI and digital technology on society and minimize its negative impacts
- Founding institutions: **18 universities and colleges** in Québec, such as:



- **100+ partners** in Québec, across Canada and internationally
- **\$2.6M+** invested in **innovative research projects** from 2019 to 2021
- **260+ researchers** working across disciplines



# The International Centre of Expertise for the Advancement of Artificial Intelligence (ICEMAI) launched in Montréal

- Spearheaded by Montréal International as part of the **Global Partnership on Artificial Intelligence (GPAI)**
- It is one of the two centres of expertise along with the centre in Paris who will work closely with the GPAI Secretariat, housed at the **OECD**
- ICEMAI will support two of the four themes the GPAI will be working on: **responsible use of AI** and **data governance**
- It will also analyze measures to strengthen our national capacity to **commercialize** and **adopt AI-related technologies**



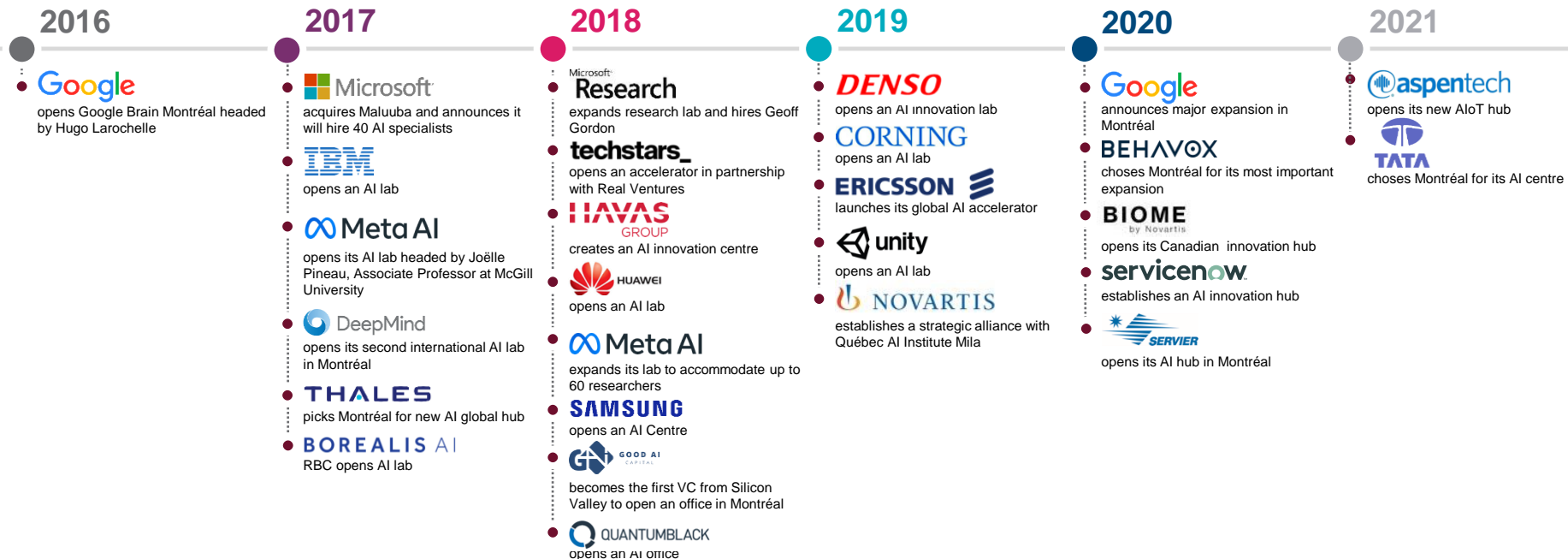
- **\$15M investment** by the Government of Québec and the Government of Canada
- **A collaboration of industry, the scientific community and civil society:**



Government of  
Canada's  
Advisory Council  
on Artificial  
Intelligence

*In addition to local and international experts*

# A few of the world leaders developing their AI expertise in Montréal



## Other foreign companies that have chosen Greater Montréal





# A strategic hub for solving environmental challenges with AI



Nearly **20 members of Mila**, specialize in research that can help fight the harmful impacts of climate change, such as:

- **David Rolnick**, McGill University
- **Yoshua Bengio**, Université de Montréal



Examples of AI research projects on **climate change** and **environmental research**:

- Using AI to visualize the **impacts of climate change**
- AI and climate change: opportunities, considerations, and policy levers to **align AI with climate change goals**



Mila has numerous projects with industry and academic partners including the **carbon footprint of AI** and the **reduction of greenhouse gas (GHG) emissions** in the energy sector:



An open-source software that help track the location-dependent carbon footprint of algorithms and code. CodeCarbon is a collaboration between BCG's GAMMA, Comet, and Haverford College



An organization created by an international group of volunteers from academia and industry with the goal of catalyzing impactful work at the intersection of climate change and machine learning



# A booming startup ecosystem

- Canada is the **most attractive country** in the world for entrepreneurs according to the OECD
- **Six of Canada's ten most active venture capital (VC) funds** in 2021 are based Montréal
- **\$8 B+** in VC investments between 2017 and 2021 in Québec, including **50%+ in Tech**
- Lucrative funding for Montréal's AI companies:



**\$436M** (2021)



**\$53M** (2019)



**\$43M** (2020)



**\$26M** (2019)

- Examples of specialized incubators and accelerators:



- And many more!

Source: OECD, "Indicators of Talent Attractiveness", 2019; Canadian Venture Capital & Private Equity Association, 2021.

# Sample of leading local companies active in AI in Montréal



# Examples of Montréal companies using AI in various fields



**IMAGIA:** AI-driven personalized care



**InVivo AI:** facilitating accurate toxicity screening in the earliest phases of drug discovery



**wrnch:** digitizing human motion and behaviour from standard video



**AFX Medical:** AI-powered radiology tools intended to treat brain disease



**Algolux:** using machine learning to empower cameras to see more clearly



**Myelin:** AI synthesis of ASD scientific data



**LANDR:** machine learning audio production platform, offering audio creators a suite of tools to support the lifecycle of creation



**Fluent.ai:** personalized intent recognition that learns from speech, behavior and context, for command and control interfaces



**Automat:** helping companies use AI to talk to their customers, understand them and serve them better



**envision.ai:** applies the science of deep learning to the art of visual media



**Via:** helping energy companies across the globe realize the value of their data through AI and blockchain



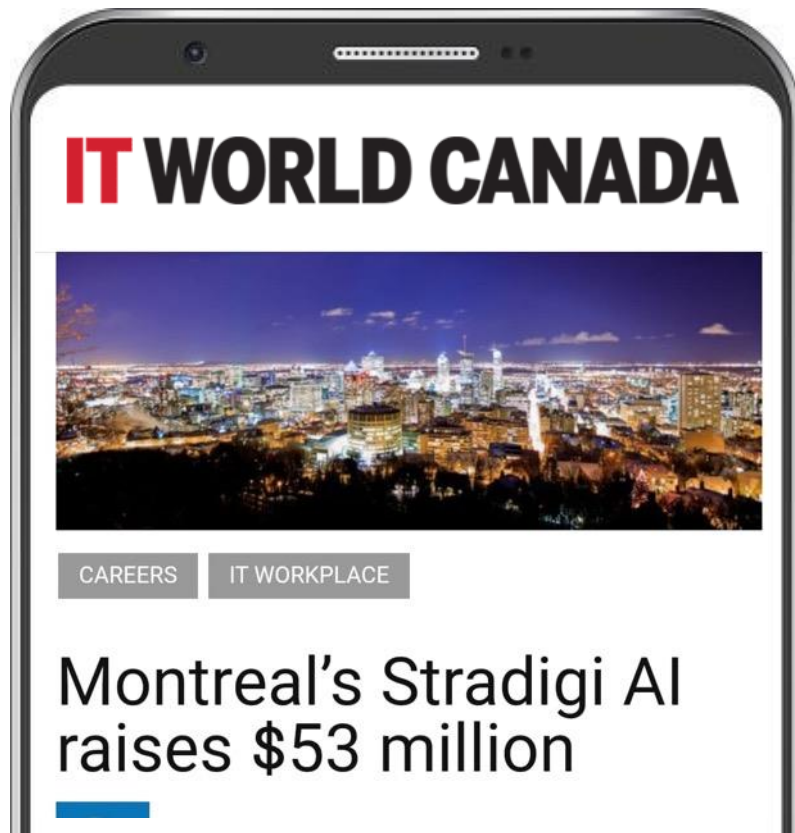
**Moov.ai:** deploys tailor-made AI and machine learning solutions bringing a concrete ROI to business challenges

# Stradigi AI, a global leader in AI platform for businesses, based in Montréal



*“Stradigi AI redefines how enterprises work by scaling AI-powered decision-making capabilities for any business user”*

Source: IT World Canada, November 14, 2019.



# At the forefront of AI for good initiatives

- **For ethical & responsible AI**



< >  
Montréal Declaration  
Responsible AI\_  
< / >

An initiative of the Université de Montréal

**Since December, 2018**  
more than 1,900 signatures  
from citizens and 108  
organizations

- **Research centres with AI for good initiatives**



Fostering a dialogue on the socially responsible use of AI and the development of social and environmental applications.  
Montréal's AI4Good lab aims to get more women working in Artificial Intelligence and other events

HumanIA

Directing AI towards the common good through humanistic and multidisciplinary studies and research



Catalyst for technosocial and responsible innovation projects



TechAide AI4Good Conference and Hackathon 2020

**SINCE ITS OFFICIAL LAUNCH IN 2016,  
TECHAIDE HAS RAISED \$1.34M FOR  
CENTRAIDE**



# AI stands on a strong information technologies ecosystem

- **160,000+ IT workers** and **7,000+ companies** in Greater Montréal
- **Lowest operating costs in North America** for software development, ahead of Toronto, Boston, New York and San Francisco
- **Broadly diversified industry:**



## Top 5

video game development hubs in the world



## 1st

city in Canada and a world leader in digital creativity



## Top 5

highest tech jobs concentrations among the largest metropolitan areas in Canada & the U.S.

### Examples of major companies located in Greater Montréal



# 02

## A Deep and Growing Pool of Highly Qualified Talent



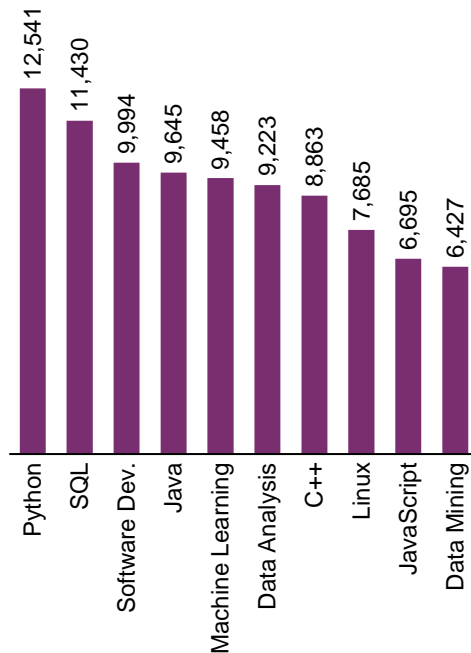
# There are more than 27,000 workers with AI skills in Montréal, an increase of 17% over the past 12 months

The 40 key skills taken into account to define AI workers\*

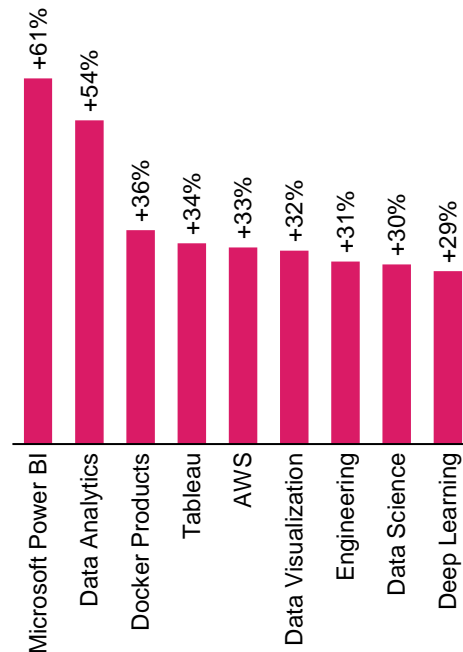


Number of Montréal LinkedIn profiles\*\* that list the skills above: **27,373**

Number of AI workers who have the skills below



Fastest-growing skills among AI workers over the past 12 months



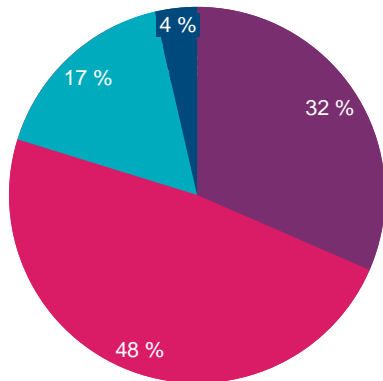
\*Key skills identified using LinkedIn's Talent Insights tool are not cumulative or exclusive.

\*\*Excluding profiles for the following titles: *founder*, *co-founder*, *CEO* and *President*.

Source: LinkedIn, Talent Insights, November, 2021.

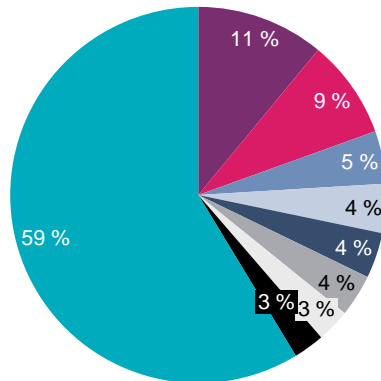
# 17% of Montréal's AI workers have a PhD and 48% have a master's degree

Highest level of education among AI workers  
(100% = 27,373)



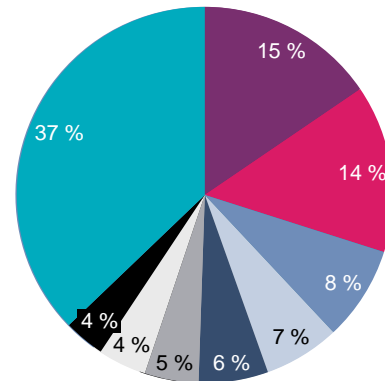
- Bachelor's degree
- Master's degree
- PhD
- Other

Fields of studies of AI workers



- Computer Science
- Computational Science
- Electrical and Electronics Engineering
- Computer and Information Sciences and Support Services
- Computer Software Engineering
- Mathematics
- Information Technology
- Physics
- Autre

Universities where AI workers earned their degrees



- Concordia University
- McGill University
- Université de Montréal
- Polytechnique Montréal
- HEC Montréal
- Université du Québec à Montréal
- École de technologie supérieure
- Université de Sherbrooke
- Autre



# The best student city in the Americas and Canada's university capital

- **Canada's university capital:** 15 university institutions and 60 colleges
- **320,000 post-secondary students**, including more than **200,000 university students** and **50,000 international students**
- **1<sup>st</sup> in Canada for university research funding** with nearly \$2B per year



**Best student city in the Americas**  
tied with Boston

QS Best Student Cities Rankings 2022

1	Montréal tied with Boston
2	Toronto
3	New York
4	Vancouver
5	San Francisco





# More than 14,000 university students are enrolled in AI-related programs

AI-related University programs	Students enrolled 2019-2020	University graduates 2019
Computer Sciences	10,181	2,061
Computer Engineering and Computer Science	2,328	464
Mathematics	1,416	313
Probabilities, Statistics and Applied Mathematics	371	84
<b>Total</b>	<b>14,296</b>	<b>2,921</b>

**PIA, a training expertise centre:** Initiative of 12 colleges and 7 universities in Montréal for training adapted to the industry

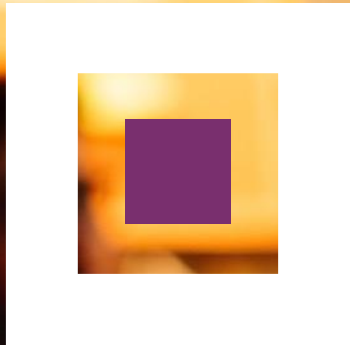
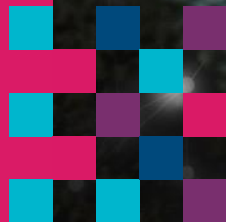


Source: Ministère de l'Éducation et de l'Enseignement supérieur, 2021; compilation Montréal International.



# 03

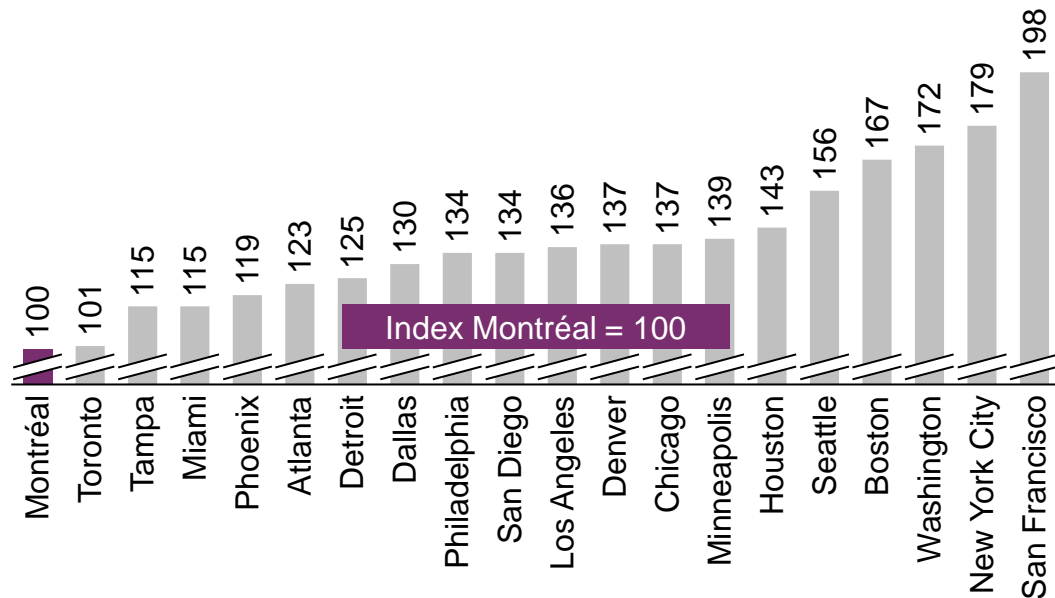
## Attractive Operating Costs and Incentives



# Operating a business costs less in Greater Montréal than in any other major metropolitan area in Canada and the U.S.

## Operating costs index for software development

20 largest metropolitan areas in Canada and the U.S., 2021



**28% cost advantage**

for **software development** compared to the average 20 largest metropolitan areas in Canada and the U.S.



# Advantageous AI and IT salaries for employers

## Annual base salaries (US\$) for AI / IT professions

	Montréal	Toronto	Vancouver	New York	San Francisco
Software Developer	\$66,172	\$66,414	\$68,672	\$104,404	\$124,957
Computer Programmer	\$68,072	\$68,321	\$70,644	\$107,932	\$129,179
Software Engineer in AI	\$75,757	\$76,034	\$78,619	\$122,504	\$146,620
Machine Learning Engineer	\$94,969	\$95,316	\$98,557	\$157,006	\$187,915
Data Scientist	\$94,969	\$95,316	\$98,557	\$157,006	\$187,915

# Low mandatory benefit costs for employers

## Examples of mandatory benefit costs for employers, 2022

Gross annual salary*	\$50,000	\$100,000	\$125,000
Québec Public Pension Plan (employee: 6.15%; employer: 6.15%, max. \$3,500)	\$2,859.75	\$3,500.00	\$3,500.00
Québec Parental Insurance Plan (employee: 0.494%, employer: 0.692%, max. sal. of \$88,000)	\$346.00	\$608.96	\$608.96
Employment Insurance (employee: 1.20%, employer: 1.68%, max. sal. of \$60,300)	\$840.00	\$1,013.04	\$1,013.04
Health Services Fund (max. 4.26% if global salary total is more than \$7M)	\$2,130.00	\$4,260.00	\$5,325.00
Commission des normes du travail (Labour standards board) (0.06%, max. sal. of \$88,000)	\$30.00	\$52.80	\$52.80
Commission de la santé et sécurité du travail (Occupational health and safety board) (0.44% in service sector, max. sal. of \$88,000)**	\$220.00	\$387.20	\$387.20
Workforce Skills Development and Recognition Fund - Québec Training Law 1% (1% of their total payroll in training for employers with total annual payroll over \$2M)	\$500.00	\$1,000.00	\$1,250.00
<b>Total benefit costs</b>	<b>\$6,925.75</b>	<b>\$10,822.00</b>	<b>\$12,137.00</b>
<b>Total cost</b>	<b>\$56,925.75</b>	<b>\$110,822.00</b>	<b>\$137,137.00</b>
<b>Total benefits in % of gross annual salary</b>	<b>13.85%</b>	<b>10.82%</b>	<b>9.71%</b>

Note: \*Paid vacation represents a minimum of 4% of salary and is included in gross salary. Some rates apply up to a maximum insurable revenue.

\*\*The rate for the service sector (65110 - *Bureau de courtage; bureau de services professionnels; bureau offrant des services de soutien administratif*) is 0.44%. The average premium rate in 2022 is \$1.77 per \$100 of payroll.

Source: Revenu Québec, 2022.

# E-Business tax credit could cover up to 30% of eligible salaries

## SCENARIO

### Québec refundable tax credit for the development of E-Business:

- Covers up to **30%** of employee salaries, including **24% refundable**, up to **\$25,000** per employee, per year

## ASSUMPTIONS<sup>1</sup>

- Foreign-controlled company
- 20 employees eligible @ \$80,000/year
- 100% of their work is related to eligible activities under the E-Business



Note:

1. All values are in \$CA.

2. The unused portion of the non-refundable tax credit can be carried back three years or forward 20 years.

Source: Ministry of Finance of Québec, 2021; Montréal International's analysis, 2021.

# R&D tax credits: 15% non-refundable from Canada and 14% refundable from Québec

SCENARIO	Canada	Québec
Scientific Research and Experimental Development (SR&ED) tax incentive program	Qualifying salaries and wages	\$1,500,000 (A) \$1,500,000 (D)
	Other eligible expenses @ 55% <sup>1</sup>	\$825,000 (B) -
	Subcontractor <sup>2</sup>	\$160,000 (C) \$100,000 (E)
	Exclusion on the first \$225,000 of R&D expenditures <sup>3</sup>	- \$(225,000) (F)
	Deduction of the Québec R&D credit <sup>5</sup>	\$(192,500) (G) -
	<b>Total qualifying expenditures</b>	<b>\$2,292,500 (A) + (B) + (C) - (G)</b> <b>\$1,375,000 (D) + (E) - (F)</b>
	Refundable Québec credit @ 14%	- \$192,500 (G)
	Non-refundable federal credit @ 15%	\$343,875 (H) -
	<b>Total tax credit</b>	<b>\$536,375 (G) + (H)</b>

Note:

1. Up to 55% of qualifying salaries and wages, federal only: expenditures should be related to R&D activities.

3. Only 80% of the amount paid to a subcontractor is eligible for a federal tax credit and 50% for Québec tax credit.

4. Québec only: For SMEs (less than \$50M assets) there is an SR&ED tax credit exclusion on the first \$50K of R&D spending. For large companies (more than \$75M assets) and companies under foreign control, the exclusion applies on the first \$225K of R&D spending. This amount is deducted of the qualifying salaries and wages.

5. For the purposes of calculating the combined rate of the credit, the tax credit from the government of Québec is applied against the federal tax credit.

Source: Ministry of Finance of Québec, 2021; PWC, 2021; Compilation: Montréal International, 2021.



# Combination of E-Business and SR&ED tax credits

## Refundable tax credits for Scientific Research and Experimental Development (SR&ED) and E-Business<sup>1</sup>:

- E-Business covers up to **30%**, including **24% refundable**, of employee salaries up to **\$25,000** per job per year
- SR&ED covers **15%** from the Government of Canada, and **14%, refundable**, from the Government of Québec

### SCENARIO

Combination of the Québec refundable tax credit for the development of E-Business and the Canada Scientific Research and Experimental Development (SR&ED)

### ASSUMPTIONS

- Foreign-controlled company
- 20 eligible employees @ \$80,000/year
- 100% of their work is related to eligible activities

	SR&ED	E-Business
	CANADA	QUÉBEC
Qualifying salaries and wages	\$1,600,000 (A)	\$1,600,000 (C)
Other eligible expenses @ 55% of A <sup>2</sup>	\$880,000 (B)	-
<b>Total qualifying expenditures</b>	<b>\$2,480,000 (A)+(B)</b>	<b>\$1,600,000 (C)</b>
<b>Federal credit @ 15% of total qualifying expenditures</b>	<b>\$372,000</b>	-
<b>Québec credit @ 30%<sup>3</sup> of total qualifying expenditures</b>	-	<b>\$480,000</b>
<b>Total credit</b>	<b>\$852,000</b>	

Other scenarios are possible to maximize the total credit amount depending on the R&D intensity

Note:

1. Company has to choose between the R-D or the E-Business tax credit for the Québec credits. Only the SR&ED applies in combination with the E-Business.

2. Up to 55% of qualifying salaries and wages, federal only: expenditures should be related to R&D activities.

3. If the company has no taxes to be paid, the Québec credit will be 24%.

Source: Ministry of Finance of Québec, 2021 - Compilation: Montréal International, 2021.



Aerial view of downtown Montréal © Montréal International

## Other major incentives

### Financial assistance for job creation and training

- **25%** of eligible costs for the implementation of a training program and **50%** of costs incurred for the creation of a human resource department

### Tax holiday for foreign researchers and experts

- Five-year Québec income tax exemption
- **0%** of provincial income tax on salary for the 1<sup>st</sup> and 2<sup>nd</sup> year
- **25%** for the 3<sup>rd</sup> year
- **50%** for the 4<sup>th</sup> year
- **75%** for the 5<sup>th</sup> year

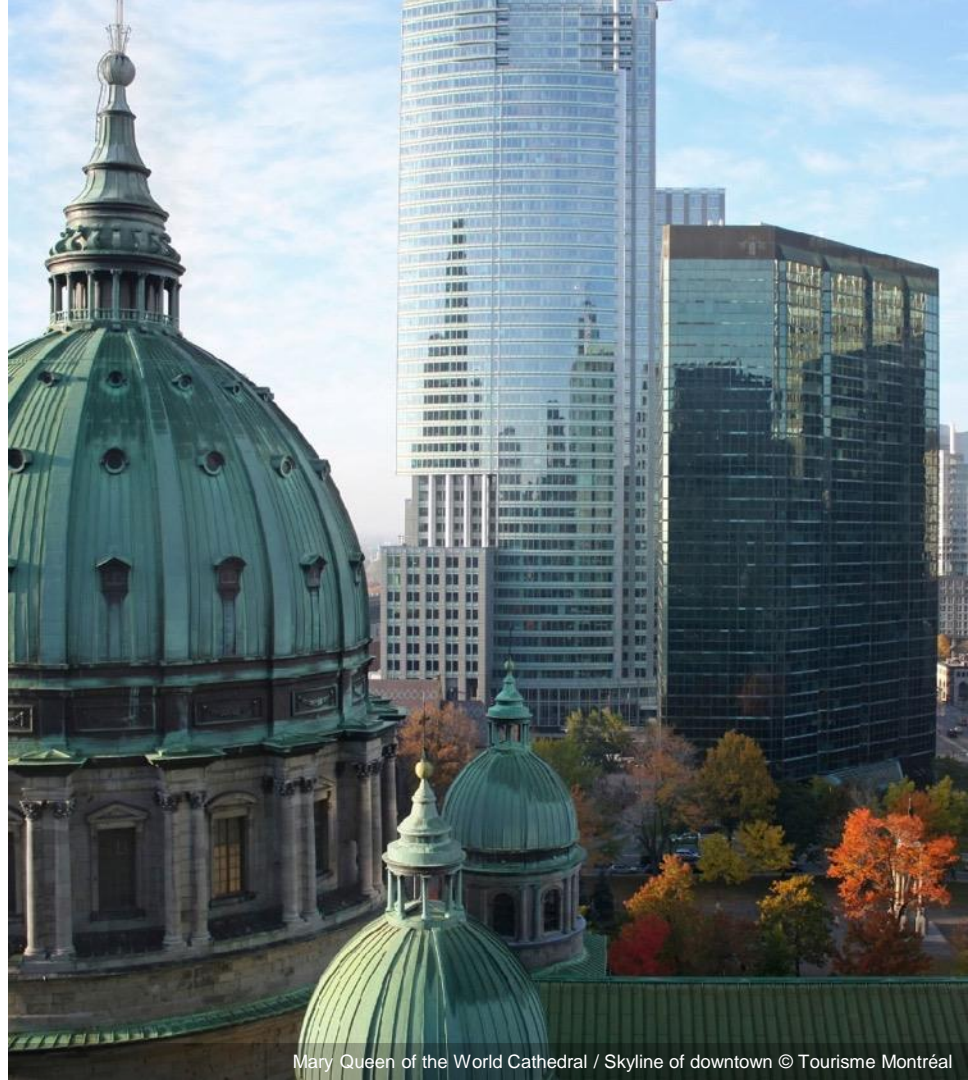
### Internship units to drive collaboration and innovation between universities and companies

- 500 internships created and \$2M invested in Québec to bolster AI research, talent development, and job creation

# Québec offers corporations an attractive tax treatment

## Comparison of corporate effective tax rate (%) Selected Canadian provinces and U.S. States, 2021

Québec (Montréal)	26.50%
Ontario	26.50%
Massachusetts	27.32%
California	27.98%
New Jersey	28.11%
Illinois	28.51%
New York	34.64%





# 04

## An Exceptional Quality of Life



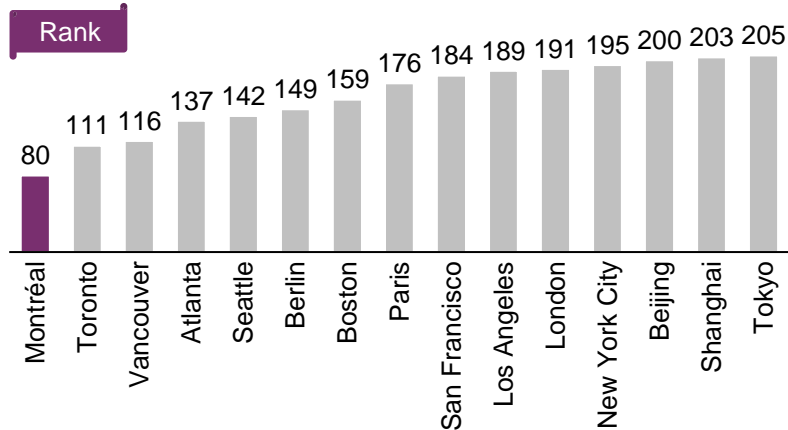




# A low cost of living

Greater Montréal is **cheaper than almost all other large cities** in North America, Western Europe, China and Japan:

**Mercer Cost of Living Index**  
World rank from least to most expensive\*, 209 cities



Greater Montréal offers a higher purchasing power thanks to:

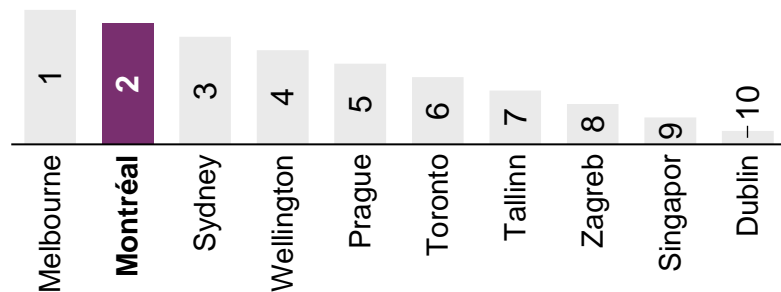
- **Cheap housing**
- **Low medical insurance costs**
- **Generous family allowances**
- **Affordable child care**

\* Montréal International's analysis.  
Source: Mercer, "Cost of Living Survey," 2021.

# An exceptional quality of life

- Montréal is the **2<sup>nd</sup> best city in the world** for remote workers:

World ranking of the best cities for remote work, WorkMotion, 2021



- Lowest homicide rate** among the 20 largest metropolitan areas in Canada and the U.S.
- Universal healthcare**
- Lowest education tuition fees** in North America
- Vibrant cultural metropolis** with 100+ festivals and 70 museums







Montréal's Olympic Stadium © Parc olympique

# Globally recognized

## **Most reputable city in the Americas**

Reputation Institute, 2018

## **Best city in Canada and 6<sup>th</sup> in the world**

Time Out, 2019

## **Best student city in the Americas** tied with Boston

QS Best Student Cities Rankings, 2022

## **Most affordable major city in Canada and the U.S.**

UBS Prices and Earnings, 2018

## **Best Cycling City in North America**

Coya, Global Bicycle Cities Index, 2019

## **Second most walkable city in Canada**

Walk Score, 2020

## **3<sup>rd</sup> friendliest city in the world**

Rough Guides, 2016

## **UNESCO City of Design since 2006**

## **Top host city in North America for international association events**

Union of International Associations (UIA), 2020

# 05

## Montréal International's Personalized, Free and Confidential Services





# Montréal International, a single point of access to a series of personalized, free and confidential services



**Long-term  
strategic support**



**Economic data  
and communication  
services**



**Government  
relations facilitation**



**Incentive programs  
assistance**



**Foreign workers  
immigration  
assistance**



**International  
recruiting solutions**



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