



4-POINT
PARTENARIAT POUR L'ORGANISATION DE
L'INNOVATION ET DES NOUVELLES TECHNOLOGIES
PARTNERSHIP FOR THE ORGANISATION
OF INNOVATION AND NEW TECHNOLOGIES

POLICIES, PRACTICES AND PROCESSES RELATED TO THE PERFORMANCE OF INNOVATION ECOSYSTEMS

2ND P4IE CONFERENCE **PROGRAM**

Hybrid conference
9-11 May 2022

It is our great pleasure to welcome you to our second “Policies, Processes and Practices for Performance of Innovation Ecosystems” (P4IE) international hybrid conference. The conference offers participants the opportunity to explore the many ways in which innovation can be strengthened in Canada and elsewhere through innovation ecosystems. This year’s conference will concentrate on:

- identifying which are the most appropriate innovation indicators, whether they stem from quantitative or qualitative measures, or a combination of both;
- understanding how to measure and build these metrics;
- evaluating how to validate their effectiveness;
- considering how to perpetuate or maintain time series of such metrics;
- understanding how to ensure their impact by meaningful storytelling, etc.;
- giving particular attention to sustainable, inclusive and sustainable innovation.

4POINT0 is a partnership that seeks to build a common knowledge mobilization (KM) channel between knowledge experts, policy- and decision-makers. The conference will bring together stakeholders from government, academia, industry and the public to create a rich environment for coordinating industrial practices, public innovation policies, university S&T diffusion, disclosure and commercialization strategies. Audiences will include:

- Industry decision makers, from SMEs to large corporations, involved in innovation ecosystems and interested in improving their innovation performance;
- University technology transfer office staff and academics wishing to commercialize their research;
- Government policy-makers, including senior officials in ministries, departments and agencies charged with devising and implementing innovation policies;
- Academic community, including students and postdoctoral fellows;
- Research and innovation intermediaries, bridging academia and industry stakeholders to facilitate collaborative research.

We have worked with a highly innovative online event firm, Tractus (<https://www.tractus.ca/>), to ensure a hybrid conference experience as real and engaging as an in-person event for those who cannot make it in person. We hope that you enjoy the conference!

4POINT0, the Partnership for the organisation of innovation and new technologies, is funded by the Social Sciences and Humanities Research Council of Canada (SSHRC), the John R. Evans Leaders Fund of the Canada Foundation for Innovation and the Subvention de soutien aux équipes de recherche of the Fonds de recherche du Québec — Société et Culture.

INTRODUCTORY WORKSHOP ON COMPUTER-AIDED ANALYSIS

Prior to the conference, we are organising an introductory one-day workshop on computer-aided analysis for people interested in social sciences and science, technology and innovation (STI).

The pre-conference event offers an introduction to Natural Language Processing (NLP) with Machine Learning (ML). Participants will be introduced to coding using Python to solve a case study on B-Corp data. **This workshop aims to help participants understand the basic elements of, and develop skills in, NLP/ML and show the contribution of data mining and AI in social sciences, arts, and culture.**

Participants will be working in interdisciplinary teams with the objectives of discussing data findings, methodology, and the potential use of NLP ML in their field of study or work. The day will start with an introductory conversation with IVADO to explore what is artificial intelligence (AI) and NLP ML, and how AI can promote social innovation to tackle societal issues using a multidisciplinary lens.

Monday 9 May 2022 [Monsella Ballroom]	
8h30-9h30	Coffee & Tea
9h00-9h30	Meet your peers
9h30-9h40	Opening words Catherine Beaudry (Polytechnique Montreal) Davide Pulizzotto (Polytechnique Montreal)
9h40-10h40	Plenary: Addressing equity, diversity and inclusion in digital intelligence to promote inclusive innovation Gabrielle Langlois, IVADO Gita Ghiasi, IVADO Amanda Riddles, IVADO Chair: Davide Pulizzotto, Polytechnique Montreal
10h40-11h10	Break
11h10-12h00	Plenary: Case study presentation Mikaël Héroux-Vaillancourt (Polytechnique Montreal) Davide Pulizzotto (Polytechnique Montreal)
12h00-13h00	Lunch Break
13h00-15h00	Workshop on Python
15h00-15h15	Closing remarks Davide Pulizzotto (Polytechnique Montreal)
15h30 – 17h00	4POINT0 members discussion: What is next for 4POINT0?
Starting at 17h00	Drink & Supper

* Time zone: EDT

MONDAY 9 MAY 2022, 15H30–17H00

DISCUSSION FOR THE MEMBERS OF 4POINT0 (AND FOR THOSE THAT WOULD BE INTERESTED IN JOINING THE PARTNERSHIP)

Chair: Catherine Beaudry, Polytechnique Montréal

Four years since the start of 4POINT0, more than two years during a pandemic, it is time to reflect and think about the future of the partnership. A number of options need to be considered and discussed. First, what topics, not necessarily limited to “policies, processes, practices for the performance of innovation ecosystems”, need to be addressed in the future as we plan for the post-pandemic recovery? Second, what mechanisms to use to fund the partnership, its research and outreach activities? Third, in what direction to expand the partnership?

MONDAY 9 MAY 2022, 9H40–10H40: PLENARY

ADDRESSING EQUITY, DIVERSITY AND INCLUSION IN DIGITAL INTELLIGENCE TO PROMOTE INCLUSIVE INNOVATION

The lack of diversity in digital intelligence hampers excellence and sustainable development in data science and poses major risks to innovation. Equity, diversity, and inclusion (EDI), therefore, remain a priority for IVADO. In this regard, a survey was sent to its community to better understand their career experiences regarding equity, diversity and inclusion in digital intelligence. Based on the data collected, a set of recommendations is being developed to address these challenges and remove barriers to creating inclusive innovation. The recommendations support IVADO's values of excellence and collaboration, and of striving to generate responsible impacts with benefits accessible to society overall.

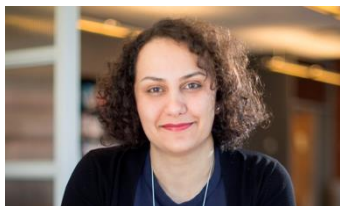
Speakers:

Gabrielle Langlois, IVADO



Gabrielle is a Partnership and Entrepreneurship Advisor at IVADO. Prior to joining IVADO, she was Director of Operations at Quartier de l'innovation de Montréal where she acquired a broad knowledge of the Montreal entrepreneurial environment **and** solid experience in project and team management. Previously, she was a project manager at the École de Technologie Supérieure where she set up strategic projects combining research, transfer to industry and impact on the territory. It was her MSc. in international business, at HEC Montréal, that led her to become interested in creative cities and territories. With the performing arts at heart, Gabrielle sits on the board of directors of Simoniaques Théâtre, a creative theater company.

Gita Ghiasi, IVADO



Gita Ghiasi is a Senior Research Advisor at Université de Montréal and a Research Associate at the EDI Lab at Concordia University. Her research focuses on the potent effects that a new technology can have, and may in future have, on society and introduces policy implications to orient emerging technologies toward equity and equality outcomes.

Amanda Riddles, IVADO



Amanda works as a Research Officer and holds a master's degree in information science from the Université de Montréal. She has an interest in the social and ethical impacts of digital intelligence and in the issues surrounding the access, evaluation and publication of scholarly research.

Chair: Davide Pulizzotto, Polytechnique Montréal



Davide Pulizzotto is a research associate specializing in textual data analysis at Polytechnique Montréal as part of the 4POINT0 project. He is a passionate researcher, who has built up his experience with an open mind and a great ability to work in a team. His research interests are in computer-assisted text analysis methods, including natural language processing and machine learning techniques, and their application in the humanities and social sciences. Most of his publications contribute to the field of digital humanities and, more specifically, to the transfer of knowledge from computer science to the humanities.

MONDAY 9 MAY 2022, 11H10–12H00: PLENARY – CASE STUDY PRESENTATION

Animator: Mikael Héroux-Vaillancourt, Polytechnique Montreal and Davide Pulizzotto, Polytechnique Montreal

The main interest of this presentation is to discuss corporate social responsibility (CSR) and the relationship between CSR and the organization's culture. The business case will focus on organizational and processes changes in B-Corp enterprises in the last 10 years. Snapshot of companies' web pages of the last 10 years (extracted from the Wayback Machine) are used for comparative analysis. Participants will be invited to analyze data using machine learning methods and NLP.

Tuesday 10 May 2022	
8h30–9h00	Coffee & Tea
9h00–9h15	Opening remark Catherine Beaudry, Polytechnique Montréal – PI and Director of 4POINT0 Greg Peterson, Statistics Canada – Co-host
9h15–10h15	Plenary: STI Metrics and Intersectionality: Assessing the Public Value of Innovation Dean Kaye Husbands Fealing, GeorgiaTech <u>Chair</u> : Louise Earl, Institute for Science, Society and Policy, University of Ottawa Guided discussion and Q&A with Dean Kaye Husbands Fealing
10h15–10h45	Break
10h45–12h00	Lessons learned from the hackathon and ways forward a Statistics act 2.0 Loïck Gautier, CIQ André Mouton, PARI International Pierre Mohnen, UNU-MERIT <u>Co-Chairs</u> : Guillaume Paré, Polytechnique Montréal Jan Kestle, Environics Analytics
12h00–13h30	Lunch Break & Guided discussion “Indicators as Incentives”
13h30–15h00	Parallel sessions & Guided discussion “Indicators as Incentives”
15h00–15h30	Break
15h30–17h00	Parallel sessions & Tool showcase & Guided discussion “Sustainable Innovation KPIs”
17h30–19h00	Student posters & Cocktail
19h00	Gala dinner

Wednesday 11 May 2022	
8h00–8h30	Coffee & Tea
8h30–10h00	Parallel sessions & Entrepreneurship workshop & Guided discussion “Indicators to Inform Policy”
10h00–10h30	Break
10h30–12h00	Panel: Innovation Ecosystem & Coordination needed between sectorial silos Carl Weatherell, CMIC Jayson Myers, NGEN Kassandra Quayle, PIC <u>Chair</u> : Iain Stewart, NRC
12h00–13h00	Lunch Break
13h00–14h00	Desert, Coffee & Closing plenary Plenary: The Puzzles and Problems at the Intersection of Knowledge-intensive Entrepreneurship with Innovation Ecosystems Maureen McKelvey, University of Gothenburg <u>Chair</u> : Catherine Beaudry, Polytechnique Montréal Guided discussion and Q&A with Maureen McKelvey
14h00–14h30	Closing remarks Catherine Beaudry, Polytechnique Montreal <i>Best poster prize</i> <i>Best paper prize</i>
15h00 – 16h30	Discussion for the members of 4POINT0 (and those interested in joining the partnership)

* Time zone: EDT

WEDNESDAY 11MAY, 15H00–16H30: DISCUSSION FOR THE MEMBERS OF 4POINT0

Four years since the start of 4POINT0, more than two years during a pandemic, it is time to reflect and think about the future of the partnership. A number of options need to be considered and discussed. First, what topics, not necessarily limited to “policies, processes, practices for the performance of innovation ecosystems”, need to be addressed in the future as we plan for the post-pandemic recovery? Second, what mechanisms to use to fund the partnership, its research and outreach activities? Third, in what direction to expand the partnership?

PLENARIES

TUESDAY 10 MAY 2022, 9H15–9H45: OPENING KEYNOTE ADDRESS

[MONSELLA BALLROOM]

STI METRICS AND INTERSECTIONALITY: ASSESSING THE PUBLIC VALUE OF INNOVATION

Keynote: Dean Kaye Husbands Fealing, GeorgiaTech



Kaye Husbands Fealing is Dean of the Ivan Allen College of Liberal Arts at the Georgia Institute of Technology, formerly the Chair of the School of Public Policy Georgia Tech. She holds a Ph.D. in economics from Harvard University, and a B.A. in mathematics and economics from the University of Pennsylvania. She specializes in science of science and innovation policy, the public value of research expenditures, and the underrepresentation of women and minorities in STEM fields and workforce. Husbands Fealing was recently elected to the American Academy of Arts and Sciences, she is an Elected Fellow of the National Academy of Public Administration, an Elected Fellow of the American Association for the Advancement of Science (AAAS), and serves on the AAAS Executive Board. She was awarded the 2017 Trailblazer Award from the National Medical Association Council on Concerns of Women Physicians.

Chair: Louise Earl, University of Ottawa



E. Louise Earl has extensive national and international experience in the measurement of science, technology and innovation (ST&I) and the development of related statistical indicators. She is best known for championing the measurement of innovation to all sectors of the economy and developing methods to measure knowledge management and other technology management and use practices. Ms. Earl has co-edited, authored and contributed to numerous chapters, volumes and classification manuals in the field of ST&I measurement. She was vice chair of the OECD's Working Party of National Experts on Science and Technology Indicators from 2016 to 2018 when she left Statistics Canada to join Treasury Board of Canada Secretariat. From 2018 to 2020, Ms. Earl developed and implemented research and data plans for the Canada's business innovation and growth support programmes. In 2020, she became a Senior Fellow with the ISSP and in 2021 joined the [Food Convergence Innovation](#) Ecosystem project as a Team Advisor through the Telfer School of Management, University of Ottawa.

TUESDAY 10 MAY 2022, 10H45–12H00: PLENARY PANEL I

[MONSELLA BALLROOM]

LESSONS LEARNED FROM THE HACKATHON AND WAYS FORWARD A STATISTICS ACT “2.0”

In this plenary discussion, the panel will first discuss the hackathon results and then address ways forward a Statistics Act “2.0”.

The hackathon took place 4-6 May 2022 and its participants were invited to explore themes such as:

- Design – How could the design of programs be modified to include data capture to facilitate delivery and assessment?
- Delivery – How might we use available data to improve the effectiveness of government supports available?
- Assessment – How might we use available methods or indicators that address the challenges of evaluating a program, such as the existence of multiple or successive supports used, or multiple targeted outcomes?

The co-chairs of this panel will then moderate a discussion on possible modifications to the Canadian Statistics Act (1985). Amendments to a Statistics Act “2.0” would take into consideration new data and methods that are currently being explored by Statistics Canada, such as the principle of open public data, while respecting the protection of digital business and personal information.

Co-chairs: Jan Kestle, Environics Analytics



*President and Founder of Environics Analytics, **Jan Kestle**, has been a leader in data and analytics for decades. An expert in using statistics and mathematics to solve social and business challenges, she has worked with hundreds of organizations in all sectors to support their data-driven decision-making. She is a member of the Canadian Statistics Advisory Council, the Board of Directors of the Canadian Marketing Association, Ted Rogers School of Management’s Dean’s Advisory Council and Western University’s Morrisette School of Entrepreneurship. Jan holds a Bachelor of Science degree in applied mathematics from Western University.*

Guillaume PARÉ, Ethicist, Polytechnique Montréal



***Guillaume Paré** has been working in the field of responsible conduct of research for the past 15 years. He is the advisor to the Director of Research and Innovation at Polytechnique Montréal and has been in charge of responsible conduct of research since the end of 2019 after more than 11 years at the Université de Montréal (UdeM). At the UdeM, he held the positions of research ethics advisor within the BCRR (2008-2018) and research advisor within the BRDV contracts and partnerships team (2019). His work experience allows him to appreciate the issues related to university research both upstream (project preparation, partnership negotiation, institutional strategic issues, etc.), during the process (responsible conduct of research, etc.) and downstream (publication, valorisation, data management, etc.). In addition, he sits on the boards of the Canadian Association of Research Ethics Board (CAREB-ACCER) and the Association of University Research Administrators of Quebec (ADARUQ).*

Speakers:

Loïck Gautier, CIQ



Loïck-Alexandre Gautier is Senior Director of the Institut de l'Innovation (within the Conseil de l'Innovation). His role is to strengthen the decision-making capacity of the Government of Quebec and the actors of the innovation ecosystem by developing an analytical framework to capture relevant data to assess the socio-economic value of sectors of interest in Quebec. Prior to joining the Innovation Council, he was responsible for developing and implementing strategies to enable QuébecInnové and its public research members to strengthen their positioning in the Quebec innovation ecosystem. With the members of his team, he connected companies and organizations with relevant partners for research and development as well as for the financing of innovative projects. He has also worked at PRIMA Québec, the advanced materials research and innovation cluster, as well as at the Ministère de l'Économie, de la Science et de l'Innovation du Québec. Loïck-Alexandre holds a Ph.D. in materials and nanotechnologies from the Institut National de la Recherche Scientifique (INRS). He has also had several experiences in companies and research laboratories within large organizations in Japan, Germany and the Netherlands.

André Mouton, PARI International



André Mouton has been with the National Research Council of Canada since 2013. Prior to his current role as Executive Director (Acting) International, he held successive positions as Industrial Technology Advisor and Regional Director in Quebec within the Industrial Research Assistance Program. Mr. Mouton has over 20 years of experience in the private high-tech sector, covering research and development, strategic international marketing and business development. He also led the deployment of business processes and systems (business intelligence, ERP) across divisions of an international conglomerate to enable decision making based on reliable metrics. He was also part of the management team of a high-tech spin-off, leading international joint development programs and negotiating partnerships with multinationals in Europe, Asia and the US. Mr. Mouton holds a Master of Science degree - major in Physics from the University of Montpellier, France and a Master of Applied Science degree - major in Microelectronics from the Polytechnic University of Montreal, Canada.

Pierre Mohnen, UNU-MERIT



Pierre Mohnen is Professorial Fellow at UNU-MERIT, Professor Emeritus at Maastricht University, Associated Fellow at CIRANO, Senior Research Associate at the Technology and Management Centre for Development at Oxford University, Associated Research Professor at ETH Zürich, and Visiting Professor at Renmin University of China. He has an MA in economics from the Catholic University of Louvain and a PhD in economics from New York University. His research is empirically oriented and deals with issues related to R&D, innovation, productivity, growth, development, competition and the evaluation of innovation, environmental and social policies.

WEDNESDAY 11 MAY 2022, 10H30–12H00: PLENARY PANEL II

[MONSELLA BALLROOM]

INNOVATION ECOSYSTEMS & COORDINATION NEEDED BETWEEN SECTORAL SILOS — HOW CAN CANADA LEAD THE WAY IN INTEGRATING NATURAL RESOURCES, AGRIFOOD PRODUCTION & TRANSFORMATION, WITH MANUFACTURING

Chair: Iain Stewart, President, National Research Council of Canada (NRC)



*In August 2016, **Iain Stewart** was appointed the 12th President of the National Research Council of Canada. His current term extends to September 2025. In September 2020, Mr. Stewart took a one-year leave of absence to become President of the Public Health Agency of Canada. He returned to the NRC in October 2021, after the successful implementation of Canada's national COVID-19 vaccine rollout. Prior to joining the NRC, Mr. Stewart was Associate Secretary of the Treasury Board Secretariat, and Assistant Deputy Minister, Policy, at the Department of Innovation, Science and Economic Development (ISED). At ISED, the Atlantic Canada Opportunities Agency, and as Assistant Vice-President of Research at Dalhousie University, Mr. Stewart has held a range of executive positions focused on supporting business innovation and university research.*

Panelists:

Kassandra Quayle, CFO, Protein Industries Canada (PIC)



***Kassandra Quayle** is the CFO at Protein Industries Canada. Kassandra leads the financial management, data and measurement and project reporting functions at Protein Industries Canada. She holds a Master of Professional Accounting degree and is a Chartered Professional Accountant. Kassandra has more than 15 years of professional experience working in public practice and within the agricultural, manufacturing, retail, and not-for-profit sectors.*

Carl Weatherell, Executive Director & CEO, Canada Mining Innovation Council (CMIC)



***Carl Weatherell** is a natural connector bringing together disparate and seemingly unrelated people, groups, and organizations to transform possibilities into plans and plans into action. Carl has a proven capacity to lead organizations and manage complex project portfolios and programs with international, multi-stakeholder project teams. Carl focuses on collaboration and building innovation ecosystems to solve complex problems. His experience includes over 30 consortia comprised of more than 500 organizations from businesses, government, and academia, spanning industries from software, microelectronics, cybersecurity, photonics, aerospace and defence, and mining. Carl has won awards for breakthrough leadership and technology transfer and holds an M.Sc. from Carleton University and a B.Sc. from the University of Waterloo.*

Jayson Myers, CEO, Next Generation Manufacturing Canada (NGen)



Jayson Myers is the Chief Executive Officer of Next Generation Manufacturing Canada. NGen is the organization that leads Canada's Advanced Manufacturing Supercluster, an initiative funded by the Government of Canada that will leverage more than \$600 million in collaborative, industry-led projects aimed at building world-leading advanced manufacturing capabilities in Canada. Jay is an award-winning business economist who specializes in industrial and technological change. Between 2007 and 2016, he served as President & CEO of Canadian Manufacturers & Exporters, Canada's largest industry and trade association. Jay has been widely recognized as one of the most influential economic policy advocates in Canada. He is an advisor to both private and public sector leaders, and has counselled Canadian prime ministers and premiers, as well as senior corporate executives and policymakers around the world. He is a member of the Advisory Board of the World Manufacturing Forum and a leading advocate on the world stage on behalf of advanced manufacturing in Canada. Jay has held a research fellowship at Nuffield College, Oxford and lectureships in political economy at Oxford and the University of Warwick. He completed his academic studies at Queen's University, UBC, the London School of Economics, and Oxford University.

WEDNESDAY 11 MAY 2022, 13H30–14H30: CLOSING KEYNOTE ADDRESS

[MONSELLA BALLROOM]

THE PUZZLES AND PROBLEMS AT THE INTERSECTION OF KNOWLEDGE-INTENSIVE ENTREPRENEURSHIP WITH INNOVATION ECOSYSTEMS

Knowledge-intensive entrepreneurship (KIE) is highly dependent upon innovation ecosystems, across many sectors of the economy. What is particularly important is that these types of firm help renew all sectors – but at different rates. Our research has shown that these KIE firms are more reliant on their innovation ecosystem than other types of firms. By this, we mean that connections and networks are highly important, in order to be able to access resources, combine different specialist knowledge, and also develop business opportunities. However, our research also shows that only a few outliers of these firms are high-growth, while many remain small. Using insight case studies and large scale studies, we will discuss some of the differences of KIE firms in sectors like creative and manufacturing as well as what happens when digital technology meets entrepreneurship in traditional sectors and sports. Hence there are a number of interesting puzzles and problems arise, when we consider the intersection between KIE firms and their innovation ecosystems.

McKelvey's plenary speech will address three issues, in order to identify and discuss the puzzles and problems. The first is how to align the incentives and capabilities of different types of actors – public agencies, large firms, NGOs, universities – with the need for KIE firms to collaborate for research and innovation. We call these innovation governance arrangements, which are necessary to collaborate. Their structure will also affect the ability of society to organize collective action, which is required for transformation through innovation and entrepreneurship. The second is about refilling the innovation commons – that is how to ensure that the larger scientific and technological knowledge pool needed keeps being 'refilled' and attracts talent. This matters because our research suggest that when KIE entrepreneurs collaborate, they also face an uncertain return to that investment because future knowledge involves both private and public returns. The third issue is lessons and where to go next with public policy –raising a few issues related to interesting current trends and policy experiments.

Keynote: Maureen McKelvey, University of Gothenburg



Maureen McKelvey is the Swedish Research Council's Distinguished Professor in Entrepreneurial Ecosystems, and Professor in Industrial Management and Economics at the Unit of Innovation and Entrepreneurship, Department of Economy and Society, School of Business, Economics and Law, University of Gothenburg, Sweden. Over the past two decades, Professor McKelvey has acted in several Scientific Boards and Advisory Committees for the most important scientific communities both within the field of Innovation Studies, for instance OECD and EU Boards, as well as in interdisciplinary fields, particularly towards engineering and business studies. She has served on DIME, DRUID, Imperial College Business School Innovation, Manchester Institute of Innovation, GEM in Grenoble, among others through her career.

Chair: Catherine Beaudry, Polytechnique Montréal



A graduate in electrical engineering from Polytechnique Montreal and a graduate in economics from the University of Oxford (master's and doctorate), **Catherine Beaudry** is currently a full professor in the Department of Mathematics and Industrial Engineering at Polytechnique Montreal. Professor Beaudry also holds a Canada Research Chair (CRC) level 1 (senior) in management and economics of innovation in addition to leading the Partnership for the Organization of Innovation and New Technologies (4POINT0). She is a Fellow of the Academy of Social Sciences of the Royal Society of Canada.

Professor Beaudry specialises in the economics of innovation and its impact on business performance, as well as in the evaluation of research and the science and technology system. The first mandate of the CRC (on creation, development and commercialisation of innovation) focused on the steps leading to innovation as well as those allowing it to create value on the market, i.e. the development of science and technology until their realisation in the form of innovative products and services. The second mandate of the CRC that she currently holds aims to create multiple-level (organizations-ecosystem-society) models and indicators on which governance and public policies specific to innovation ecosystems can lean on. This multidisciplinary work aims to consider the science, technology and innovation system as a whole, and thus to breakdown the silos inherent to the innovation process.

Her main research interests are collaboration and support mechanisms for public and private organisations involved in knowledge and innovation ecosystems. In particular, her research focuses on the interaction between science and technology networks and industrial clusters, and how they influence the performance and survival of innovative organisations. 4POINT0 aims to develop new innovation indicators (derived from web mining) adapted to these ecosystems, so as to provide decision-makers with near-real time decision-making tools.

IN-PERSON GUIDED DISCUSSIONS

[BALLADE]

Thinking about the post-pandemic recovery is a challenge on everyone's mind. Reflecting on this challenge implies that we avoid repeating mistakes of the past and build a better economy and society. It requires the contribution of everyone's knowledge and skills, as well as the coordination of public policies, practices and innovation processes. Indicators act as powerful incentives for individuals and organizations. As such, if well designed, they can guide the way we measure innovation activities and results for sustainable, inclusive and responsible outcomes. Governments and innovation intermediaries also rely on these indicators to inform policy, measure impact and fine tune support mechanisms.

You are therefore invited to join us for three insightful discussion tables around themes related to how indicators, or metrics that matter, can shape a better future by fostering the right behavior, support the best policies, bring clarity and consensus on the sustainable/inclusive/responsible/ESG/green innovation agenda.

Guided discussions will follow Chatham House Rules: "participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed".

TUESDAY 10 MAY 2022, 12H30–13H30 (LUNCH TIME START) & 13H30–15H00

THEME: INDICATORS AS INCENTIVES

Taking 4POINT0's Peter Phillips' article as an inspiration: "[Cutting to the chase on fossil fuel subsidies](#)", the question to discuss is: How to design innovation indicators to steer us in the right direction and avoid repeating errors of the past and going in the wrong direction?

Chair: Peter Phillips, University of Saskatchewan

Facilitator: Elicia Maine, Simon Fraser University

TUESDAY 10 MAY 2022, 15H30–17H00

THEME: SUSTAINABLE INNOVATION KPIS

Following 4POINT0's Philip Shapira's article: "[Introducing the dilemma of societal alignment for inclusive and responsible research and innovation](#)", the question to discuss is: How to transform actual innovation indicators to add the sustainable, inclusive and responsible dimensions?

Chair: Hassana El-Zein, CIRODD

Facilitator: Philippe Genoux-Lefrançois, CIRODD

WEDNESDAY 11 MAY 2022, 8H30–10H00

THEME: INDICATORS TO INFORM POLICY

Following last year's workshop on measuring the performance and impact of innovation ecosystems (meso level indicators) at the First P4IE conference, and Catherine Beaudry & Laurence Solar-Pelletier's IRPP article as an inspiration: "[The Superclusters Initiative: An Opportunity to Reinforce Innovation Ecosystems](#)", the question to discuss is: Do we have the right set of indicators to measure innovation activities and the success of innovation ecosystems such as the Superclusters or the "Zones d'innovation du Québec"?

Chair: Joanne Castonguay

Facilitator: Brian Wixted

SPECIAL EVENTS

TUESDAY 10 MAY 2022, 15H30–17H00: TOOL SHOWCASE

[MONSELLA C]

During this special event, three tools will be presented. IPMetrix, developed by TKM, SONARD4d developed by PARI International and Automated web-scraping, developed by Davide Pulizzotto.

Presenters: Christophe Lecante, TKM

Davide Pulizzotto, Polytechnique Montréal

André Mouton, PARI International

IPMETRIX

Christophe Lecante, TKM

“From green washing to green compliance! How can AI provide metrics for separating the wheat from the chaff”

The use-case to be shared is based on a real case study in the field of chemicals and we will suggest prospective thinking on how a similar methodology could apply to the B-Corp certification.

IPMetrix is an AI and datamining software platform developed by TKM: a French spin-off company from Grenoble Alpes University (FR).

Throughout the world, zettabytes of data are produced each year, in every field, via a variety of sites or databases, structured and unstructured alike. Thanks to IPMetrix, researchers and analysts can collect, aggregate, cure and enrich huge worldwide dataset with scientific and technological information (*papers, patents, projects, thesis, conference,...*) before analyzing, visualizing and producing key metrics you need. State of the art studies, technological watch and prospective, ideation and problem solving, policy impact review, biblio or scientometrics are one of many use case where Artificial intelligence can provides added value to inform better decisions without overlooking any strategic information.

SONARD4d

André Mouton, PARI International

SONAR4d is a tool to access available business and technical information from Canadian firms. It supplements the expertise of NRC IRAP's Industrial Technology Advisors (ITA).

NRC IRAP is currently using SONAR4d on a pilot scale to assess its value and potential improvements.

Automated web-scraping

Davide Pulizzotto, Polytechnique Montréal

The field of social science is changing under the pressure of data science. This revolution is driven by its new ways of creating and collecting data from unusual sources, such as the web. In fact, a tremendous lure of the Internet is the availability of vast amounts of data on businesses, people, and their activity. Our first question is how to access it? Web scraping is the process of automatically download information from web pages. This can be highly effective, particularly when structured data are made available online directly. It is also useful in cases where we need to look at the website, identify what and how to get the information we want, and then process it. It exists several tools to build your own web scraping process. During this showcase, a Python script is presented targeting people who have never seen a robot doing the job at their place!

WEDNESDAY 11 MAY, 8H30–10H00: ENTREPRENEURSHIP WORKSHOP

[MONSELLA D]

This special event consists in a paper development workshop for the Call for papers for the Special issue titled: **Science and Technology Entrepreneurship Education: Pedagogy, Programs, and Ecosystems**. During the workshop, participants will be asked to contrast perspectives from research (i.e. “academic”) and practice (industry and public policy makers).

Animators: Fabiano Armellini, Polytechnique Montréal

Sophie Veilleux, Université Laval

The special issue aims to expand our knowledge of the entrepreneurial processes underpinning the formation, survival, growth and impact of science and technology-based firms and of the pedagogy, educational programs, and ecosystems which support the development and deployment of entrepreneurial capabilities by scientists and engineers. The main objective is to improve the efficacy of such programs one by investigating the gaps in the process of translation of science to entrepreneurship, by exploring the continuum of entrepreneurship educational objectives, and by analysing intermediate and outcome metrics.

Guest Editors Team:

Fabiano Armellini, Polytechnique Montréal, Canada, fabiano.armellini@polymtl.ca

Sarah Lubik, Simon Fraser University, Canada, sarah_lubik@sfu.ca

Shiri M. Breznitz, Munk School of Global Affairs & Public Policy, Canada, shiri.breznitz@utoronto.ca

Elicia Maine, Simon Fraser University, Canada, emaine@sfu.ca

Sophie Veilleux, Université Laval, Canada, sophie.veilleux@fsa.ulaval.ca

Tuesday 10 May 2022, 13h30–15h00 EDT			
Parallel sessions 1			
1A NLP/Text Mining – New Innovation Indicators	1C Health Innovation Ecosystems	1D Sustainable/Inclusive/Responsible Innovation Ecosystems	1E Guided discussion – Indicators as incentives
Monsella A	Monsella C	Monsella D	Ballade (lunch time start)
Chair: Pierre Mohnen Discussant: Amal Zouaq	Chair: Annie Passalacqua Discussant: Patrick Cohendet	Chair: Mario Bourgault Discussant: Sandra Schillo	Chair: Peter Phillips Facilitator: Elicia Maine Note taker: Pietro Cruciata
NLP approaches to build innovation indicators Pietro Cruciata, Davide Pulizzotto, Catherine Beaudry	Measuring the diffusion dynamics of cutting-edge technological innovations in Life Science academic research Laurence Lejeune	Invention to innovation: Creating the conditions for impact from university science Andrew Park, Elicia Maine, Sarah Lubik	Taking 4POINT0's Peter Phillips' article as an inspiration: " Cutting to the chase on fossil fuel subsidies ", the question to discuss is: How to design innovation indicators to steer us in the right direction and avoid repeating errors of the past and going in the wrong direction?
Detecting emerging technologies in artificial intelligence scientific ecosystem Ali Ghaemmaghami, Andrea Schiffauerova, Ashkan Ebadi	Ready to innovate during a crisis? Innovation governance during the first wave of the COVID-19 pandemic Maureen McKelvey, Rögnvaldur J. Saemundsson	The RIH Assessment Tool: an external evidence-informed approach to measure the degree of responsibility of health innovations Silva Hudson, Pascale Lehoux	
A topic-based patent analysis for mapping technological trends in 5G industry Davide Pulizzotto, Mehdi Rhaïem, Anas Ramdani, Catherine Beaudry	The role of pre-formation intangible assets in endowing science-based university spin-offs V. J. Thomas, Andrew Park, Elicia Maine, Azadeh Goudarzi, Pegah Yaghmaie	Update on direction of travel for the International Sustainability Standards Board Anne-Marie Hubert	
Star scientists' prediction in AI scientific ecosystem using machine learning techniques Koosha Shirouyeh, Ashkan Ebadi, Andrea Schiffauerova			

Tuesday 10 May 2022, 15h30–17h00 EDT

Parallel sessions 2

2A STI indicators – New Methods	2B Collaboration & Skills Innovation Policy Indicators	2C Tools Showcase	2D Entrepreneurship ecosystems	2E Guided discussion – Sustainable Innovation KPIs
Monsella A	Monsella B	Monsella C	Monsella D	Ballade
<u>Chair</u> : Stephanie Haustein <u>Discussant</u> : Pierre Mohnen	<u>Chair</u> : Geneviève Dufour <u>Discussant</u> : Peter Philips	<u>Chair</u> : Catherine Beaudry	<u>Chair</u> : Fabiano Armellini <u>Discussant</u> : Sophie Veilleux	<u>Chair</u> : Hassana El-Zein <u>Facilitator</u> : Philippe Genois-Lefrançois <u>Note taker</u> : Alvar Herrera
Using simulation to investigate the role of critical actors in collaborative ecosystem <u>Mahsa Noori Najafi</u> , Andrea Schiffauerova, Ashkan Ebadi	How decision autonomy and learning in response to new technologies condition the innovative capacity of Canadian firms <u>Tracey White</u> , David Wolfe	<u>Christophe Lecante</u> , TKM <i>"From green washing to green compliance! How can AI provide metrics for separating the wheat from the chaff"</i>	Rapid response through the entrepreneurial capabilities of academic scientists <u>Andrew Park</u> , Pegah Yaghmaie, Elicia Maine, Azadeh Goudarzi, Jon Thomas	Following 4POINT0's Philip Shapira's article: "Introducing the dilemma of societal alignment for inclusive and responsible research and innovation" , the question to discuss is: How to transform actual innovation indicators to add the sustainable, inclusive and responsible dimensions?
Moving beyond peer review with performance measures <u>Bert van den Berg</u>	Quebec's Innovation Barometer to track impact of the next « Stratégie québécoise de la recherche et de l'innovation (SQRI) » <u>Loïck Gautier</u>	<u>André Mouton</u> , NRC <i>SONAR4d is a tool to access available business and technical information from Canadian firms.</i>	Too much support? Entrepreneurial ecosystems and firm growth in the Greater Toronto Area <u>Shiri Breznitz</u> , Qiantao Zhang, Steven Denney	
Scientific collaboration among AI researchers: Does proximity matter? <u>Mohammadmahdi Toobaee</u> , Andrea Schiffauerova, Ashkan Ebadi	Digital Health Circle: Impact of industry-led health technology innovation <u>Sylvain Moreno</u> , Greg Christie	<u>Davide Pulizzotto</u> , Polytechnique Montréal <i>Automated web-scraping During this showcase, a Python script is presented targeting people who have never seen a robot doing the job at their place!</i>	Toward a continuum approach to science-based innovation and entrepreneurship in Canada <u>Sarah Lubik</u> , James McLellan, Elicia Maine	
Exploration of web-based indicators in classic innovation studies <u>Mikaël Héroux-Vaillancourt</u> , Catherine Beaudry			Supporting technological new ventures from the ideation to the business concept phase <u>Octave Niamié</u>	

Wednesday 11 May 2022, 8h30–10h00 EDT				
Parallel sessions 3				
3A STI Policy for Innovation Ecosystems	3B Mobility/Infrastructure Innovation Ecosystems	3C Innovation Ecosystem Value and Actors	3D Entrepreneurship Workshop	3E Guided discussion – Indicators to inform policy
Monsella A	Monsella B	Monsella C	Monsella D	Ballade
Chair: Dany Brouillette Discussant: Danny Leung	Chair: Claude Faribault Discussant: Emmanuel Mussault	Chair: Dominique Sauvé Discussant: Catherine Beaudry	Animators: Sophie Veilleux Fabiano Armellini	Chair: Joanne Castonguay Facilitator: Brian Wixted Note taker: Annie Passalacqua
Improving the performance of Canada's innovation ecosystem: Intergovernmental collaboration and multilevel governance in Ontario Michele Mastroeni, Jonathan Landon, Tamara Doerkson, Linying Dong, <u>Emily Rezkalla</u>	Integrated mobility and the governance of urban transit <u>David A Wolfe</u> , Elena Goracinova	Value creation in innovation ecosystems: the role of proximity for sustainability <u>Giulia Piantoni</u> , Marika Arena, Giovanni Azzone	This paper development workshop for the Call for papers Special issue Science and Technology Entrepreneurship Education: Pedagogy, Programs, and Ecosystems will discuss the following statements to contrast perspectives from research ("academic") and practice (industry and public policy makers).	Following last year's workshop on measuring the performance and impact of innovation ecosystems (meso level indicators) at the First P4IE conference, and Catherine Beaudry & Laurence Solar-Pelletier's IRPP article as an inspiration: " The Superclusters Initiative: An Opportunity to Reinforce Innovation Ecosystems ", the question to discuss is: Do we have the right set of indicators to measure innovation activities and the success of innovation ecosystems such as the Superclusters or the "Zones d'innovation du Québec"?
How do multinational digital firms affect local ecosystems? Evidence from Canada <u>Tazia Khushboo</u> , Alexander Whalley, Jean-William Laliberte	Ecosystem risks of peer-to-peer electricity trading <u>Mehdi Montakhabi</u> , Wim Vanhaverbeke	Actors' positioning in an emerging innovation ecosystem – The case of green hydrogen <u>Michael Wustmans</u> , Stefanie Bröring, V.J. Thomas, Elicia Maine		
Incorporating industry perspectives into the innovation policy process <u>Travis Southin</u>	The sustainable mobility innovation ecosystem <u>Ricardo H. Da Silva</u>	Product value chains illuminate innovation impact pathways <u>Gretchen Jordan</u>		
	Drivers, barriers, and tensions in adopting innovation in construction ecosystems: The case of integrated design processes in Quebec, Canada <u>David Smith</u> , Gonzalo Lizarralde, Mario Bourgault	Internal and external alignment activities of an emerging innovation ecosystem - The case of cultured meat ecosystems <u>Kra Kouadio Kouassi</u> , Majlinda Zhegu, Xavier Olleros, Ingela Sölvell		

TUESDAY 10 MAY 2022, 13H30–15H00: PARALLEL SESSIONS 1

SESSION 1A – NLP/ TEXT MINING – NEW INNOVATION INDICATORS [MONSELLA A]

In the NLP field, applications are as varied as our imagination can be. The lectures present text mining methods to word count methodologies, indicator-based method with NLP to capture emerging technologies, text mining and network analysis to reveal trends and hotspots of technology development, and calculation of composite score to predicting new star scientists.

Chair: Pierre Mohnen

Discussant: Amal Zouaq

NLP approaches to build innovation indicators

Pietro Cruciata¹, Davide Pulizzotto¹, Catherine Beaudry¹

¹École Polytechnique de Montréal

Our research offers alternative and complementary approaches to word count methodologies, largely used to develop innovation indicators. We applied two approaches used in the NLP field (WSD and IR) to solve two main issues related to word count: polysemy and semantic ellipsis. We obtain unsatisfactory results on the WSD task performing the Lesk algorithm due to issues connected to the overlapping method. Conversely, we achieve good results with our IR model, and we further improve them developing a combined method with the keyword search. These preliminary results can facilitate the creation of reliable innovation indicators from unstructured textual data.

Detecting emerging technologies in artificial intelligence scientific ecosystem

Ali Ghaemmaghami¹, Andrea Schiffauerova¹, Ashkan Ebadi^{1,2}

¹Concordia University, Concordia Institute for Information Systems Engineering

²National Research Council Canada

Capturing emerging technologies is a very useful tool for a broad range of different groups, institutions, and people. By using an indicator-based method with a combination of the Natural Language Processing methods, we detected most emergent terms in the field of Artificial Intelligence (AI) with their scores of emergence. We improved the existing method in the literature with new emergent metrics and introduced a normalized emergence score that can capture emergent technologies in a more consistent way and independent of the dataset and its attributes such as its size.

A topic-based patent analysis for mapping technological trends in 5G industry

Davide Pulizzotto¹, Mehdi Rhaïem¹, Anas Ramdani¹, Catherine Beaudry¹

¹École Polytechnique de Montréal

This paper aims to track waves of innovations in the fifth generation (5G) technologies for mobile communication through patent analysis. It combines text mining techniques and network analysis to reveal trends and hotspots of technology development. It also proposes a semi-supervised method to eliminate not relevant documents from a large patent dataset. Results show a mapping of the 5G technological trends in 50 topics, which are identified by a topic model technique. Then, an analysis of the top 20 major players underlines a bipolar configuration between China and the rest of the World in the race of 5G development.

Star scientists' prediction in AI scientific ecosystem using machine learning techniques

Koosha Shirouyeh¹, Ashkan Ebadi², Andrea Schiffauerova²

¹Concordia University, Department of Mechanical, Industrial and Aerospace Engineering

²Concordia University, Concordia Institute for Information Systems Engineering

Predicting junior researchers who can potentially become star scientists in the future can be helpful for academic decision-makers to come up with their plans, such as resource allocation and recruit decisions. In this study, we calculated a composite score based on the dynamic quality of publications to evaluate researchers. Also, some new factors have been considered among traditional factors used in previous studies and different machine learning techniques have been applied to address the prediction problem. Ultimately, the experimental results on Scopus datasets for authors in the field of artificial intelligence showed that our model outperforms previous ones.

SESSION 1C – HEALTH INNOVATION ECOSYSTEMS [MONSELLA C]

The creation and use of new scientific and technical knowledge is an uncertain and complex process (Fagerberg, Mowery, and Nelson 2005). This session is about measuring the diffusion dynamics of high-technological innovations in Life Science academic research, the innovation governance during the first wave of the COVID-19 pandemic, and the interplay between pre-formation intangible assets and the entrepreneurial capabilities of scientist-entrepreneurs in the British Columbia biotechnology IE.

Chair: Annie Passalacqua

Discussant: Patrick Cohendet

The role of pre-formation intangible assets in endowing science-based university spin-offs

V. J. Thomas³, Andrew Park¹, Elicia Maine², Azadeh Goudarzi², Pegah Yaghmaie²

¹Gustavson School of Business, University of Victoria

²Beedie School of Business, Simon Fraser University

³School of Business, University of the Fraser Valley

Science-based university spin-offs are increasingly being recognized for their role in enabling solutions to significant societal challenges. We explore the interplay between pre-formation intangible assets and the entrepreneurial capabilities of scientist-entrepreneurs and how that interplay impacts spin-off performance. Through case studies of three science-based USOs in the British Columbia biotechnology innovation ecosystem we find evidence of the importance of pre-formation intangible assets and their mobilization through the entrepreneurial capabilities of academic scientists. A theory-driven model depicting the role of pre-formation intangible assets in endowing science-based USOs for success is developed. Innovation policy recommendations and metrics are provided.

Measuring the diffusion dynamics of cutting-edge technological innovations in life science academic research

Laurence Lajeune¹

¹Université du Québec à Montréal

The diffusion dynamics (need, adoption, implementation, research output) of high-end technologies in the academic life-science ecosystem can be an important new impact indicator of research success. Understanding the factors influencing these dynamics and discussing the availability of the relevant data sources can provide strong evidence of successful approaches or existing barriers towards research success and as such suggest new strategies for policy makers and funding agencies at the local, national or international level.

Ready to innovate during a crisis? Innovation governance during the first wave of the COVID-19 pandemic

Maureen McKelvey¹, Rögnvaldur J. Saemundsson¹

¹University of Gothenburg, Department of Economy and Society School of Business

The purpose of this paper is thus to increase our understanding of the relationship between innovation governance and the likelihood of beneficial outcomes in the context of the generation and use of new scientific and technical knowledge. We do so by empirically analyzing the response to Covid-19 in Iceland using the concept of innovation governance readiness. This case is interesting because a diverse set of actors were mobilized, both public, private, and civil society, to help with the response.

SESSION 1D – SUSTAINABLE / INCLUSIVE / RESPONSIBLE INNOVATION ECOSYSTEMS [MONSELLA D]

Scientific innovations lead to societal and economic benefits. In this session, there will be an analysis of the growing literature on science-based innovation, a presentation of the Responsible Innovation in Health Assessment Tool to measure the presence of responsibility features in health innovations, and sustainability measures that matter to evaluate responsible investments.

Chair: Mario Bourgault

Discussant: Sandra Schillo

Invention to innovation: Creating the conditions for impact from university science

Andrew Park¹, Elicia Maine², Sarah Lubik²

¹Gustavson School of Business, University of Victoria

²Beedie School of Business, Simon Fraser University

Universities play a central role in producing breakthrough scientific inventions and translating them to societal and economic benefits. This paper aims to critically analyze the growing literature on science-based innovation, present the current state of understanding of the field and provide practical recommendations for scholars, policymakers, scientist-entrepreneurs and university leadership. We develop a novel framework of the determinants and outcomes of science-based innovation, which reveals that understanding the process of translating university science to economic and societal impacts requires looking beyond traditional metrics and factors. We conclude by recommending strategies and policies for the commercialization of breakthrough inventions from universities.

The RIH Assessment Tool: an external evidence-informed approach to measure the degree of responsibility of health innovations

Silva Hudson¹, Pascale Lehoux¹

¹Université de Montréal

To measure the presence of responsibility features in health innovations, we developed the Responsible Innovation in Health (RIH) Assessment Tool, which entails a three-step process: the screening step quickly identifies whether an innovation may potentially qualify as a RIH, the assessment step evaluates its degree of responsibility through nine attributes, and the rating step examines both the quality of the information sources and the number of attributes documented to generate the overall RIH score. The latter indicates whether 'almost none', 'few', 'many' or 'almost all' RIH features are present. A conservative interpretation of the score is adopted.

Update on direction of travel for the International Sustainability Standards Board

Anne-Marie Hubert, EY

Update on the activities of the International Sustainability Standards Board (ISSB). The creation of the ISSB was announced on November 3rd 2021, Finance day of COP26. The issuers will drive issuers to provide investors consistent, comparable and reliable reporting on sustainability measures that matter to evaluate investments. We will share insights on the standard setting process, a unique opportunity for researchers and investors committed to the UN principles for responsible investments to work together to transform capital markets and contribute to reallocation of capital towards organizations that drive value for investors by driving value for all stakeholders.

TUESDAY 10 MAY 2022, 15H30–17H00: PARALLEL SESSIONS 2

SESSION 2A – STI INDICATORS – NEW METHODS [MONSELLA A]

In this session, researchers will present new methods of STI to quantify certain issues. Lectures will be on mapping the complex structure of innovation and knowledge creation, selecting competition 'winners' of research programs supporting innovation by measuring subsequent innovation impact, the relationship between different forms of proximity and scientific collaboration among AI researchers, and web mining technique to source data in order to analyse innovation of technological firms.

Chair: Stephanie Haustein

Discussant: Pierre Mohnen

Using simulation to investigate the role of critical actors in collaborative ecosystem

Mahsa Noori Najafi¹, Andrea Schifffauerova¹, Ashkan Ebadi²

¹Concordia University, Concordia Institute for Information Systems Engineering

²National Research Council Canada

Defining critical actors and computing their effectiveness on network productivity help us map the complex structure of innovation and knowledge creation. The objective of this work is to examine critical actors and their impact on collaboration network. The AI-related publications dataset is extracted from the SCOPUS database. The methodology involves building an agent_based model using Python ABM library MESA. Authors are the autonomous components with unique properties of an agent-based model, which are developed to investigate collaboration network behavior under their different actions and interactions. According to our results, actors' positions in a network are positively correlated with research performance.

Moving beyond peer review with performance measures

Bert van den Berg, Consultant

There is growing research showing that peer review is unreliable for selecting competition 'winners', largely because the reviewers' scoring has substantial variability. While peer review is still relevant for removing applications of lower quality from competitions, other selection methods are generally needed for final selections. One approach to final selection might be based on individual evaluation criteria or attributes of applications which are seen as most linked to impact. For research programs supporting innovation, measuring the subsequent innovation impact of selected applications can provide insight on program attributes most relevant to innovation.

Exploration of web-based indicators in classic innovation studies

Mikaël Héroux-Vaillancourt¹, Catherine Beaudry

¹École Polytechnique de Montréal

We use a web mining technique to source data in order to analyse innovation of technological firms. We used the data of 788 respondents who participated into 13 questionnaire-based investigations about innovation. We extracted the content of the corresponding websites and analysed them based on keywords related to innovation concepts (innovation culture, open innovation and R&D) important for the innovation of tech firms. We built regression models with both questionnaire-based and web-based indicators in order to test the contribution of our Web-based indicators. Our preliminary results show significant models where web-based indicators contribute significantly to the explanation of innovation performance.

Scientific collaboration among AI researchers: Does proximity matter?

Mohammadmahdi Toobaee¹, Andrea Schifffauerova¹, Ashkan Ebadi²

¹Concordia University, Concordia Institute for Information Systems Engineering

²National Research Council Canada

The effect of different forms of proximity on scientific collaboration among regions and organizations has been studied thoroughly in recent years. However, the role of different dimensions of proximity in facilitating scientific collaboration at the individual level has not been adequately addressed. Using co-publication data of North American AI scientists from 2000 to 2019, we studied the relationship between different forms of proximity (Cognitive, Geographical, Network, and Institutional) and scientific collaboration. The SHAP feature importance

analysis resulting from the XGBoost classifier showed that cognitive proximity is the most important feature in predicting future scientific collaboration, followed by geographical proximity.

SESSION 2B – COLLABORATION & SKILLS INNOVATION POLICY INDICATORS [MONSELLA B]

If inclusive and sustainable innovation drive economic growth, we must discard deeply entrenched ideas about how value is created. In this regard, it will be question of the need for innovation metrics founded on the competence of people and firm, the Innovation Barometer of the Conseil de l'innovation du Québec, and digital health tools to deliver better and more affordable care.

Chair: Geneviève Dufour

Discussant: Peter Philips

How decision autonomy and learning in response to new technologies condition the innovative capacity of Canadian firms

Tracey White¹, David Wolfe¹

¹Innovation Policy Lab, Munk School of Global Affairs, University of Toronto

In this paper we answer the call to “go back to the drawing board” to rethink innovation metrics. If innovation is the driver of economic growth, if it is to be inclusive and sustainable then we must discard deeply entrenched ideas about how value is created. Mainstream measures of innovation are inadequate because they are rooted in economic models predicated on static equilibria. Such models are unable to account for dynamic variables notably human ingenuity and technological change. The contribution of this paper is to explore a human-centered approach to innovation founded on the competence of people and firms.

Quebec's Innovation Barometer to track impact of the next « Stratégie québécoise de la recherche et de l'innovation »

Loïck-Gautier, CIQ

Québec ministry of economy and innovation mandated the Conseil de l'innovation du Québec to develop an innovation barometer. It aims, first, to provide a comparative analysis of Quebec's performance in terms of innovation at the provincial level, in its regions and in relation to other Canadian provinces. Secondly, it aims to try to overcome the lack of data and to collect more granular information on the actors that make up the entire innovation chain to allow a more local comparison, by sector and by region. These two levels of barometer will allow decision-makers to follow the evolution of each ecosystem, the strengths and weaknesses relating to their research and innovation system and to identify the priority areas to stimulate performance in terms of innovation and increase the (socioeconomic) wealth of Quebec while improving environmental and social impacts. This initiative also aims to provide relevant information to existing innovation ecosystem actors to help them develop action plans to improve their performance. For this presentation, we will discuss the problem of data access and the solutions that we are working toward. At the same time, it's a call to action to develop collaborations and bring people to work together and share data.

Digital Health Circle: Impact of industry-led health technology innovation

Sylvain Moreno¹, Greg Christie¹

¹Simon Fraser University

Canada's aging population and ongoing challenges from COVID-19 have made digital health a must-have tool to deliver better, more affordable care. Small businesses dominate this sector but are struggling to commercialize their products and scale up. In large part, this is because of difficulties accessing healthcare systems. Here, we present the impact from a three-year program to unite health stakeholders for successful technology development. Our co-creation method aligns industry, government, patients, academia, and other partners to identify needs, develop solutions that address these needs, and facilitates adoption with end users both in Canada and throughout the world.

SESSION 2D – ENTREPRENEURSHIP ECOSYSTEM [MONSELLA D]

Entrepreneurial support systems are here to help. The lectures present capabilities enabling an academic scientist-entrepreneur to respond rapidly to health and humanitarian crises and create economic and social impact, the entrepreneurial ecosystem adopted by policy-makers, an advocacy for an entrepreneurial approach to success indicators in science-based innovation, and supporting the aspiring entrepreneur when he create a business concept.

Chair: Fabiano Armellini

Discussant: Sophie Veilleux

Rapid response through the entrepreneurial capabilities of academic scientists

Andrew Park¹, Pegah Yaghmaie², Elicia Maine², Azadeh Goudarzi², Jon Thomas³

¹Gustavson School of Business, University of Victoria

²Beedie School of Business, Simon Fraser University

³School of Business, University of the Fraser Valley

Well-endowed science-based ventures, attracting resources and advancing novel capabilities, can rapidly respond to pressing global health and humanitarian crises such as COVID-19. Policymakers are motivated to leverage university science for the dual purpose of solving emerging challenges and increasing economic productivity. Using evidence from the University of British Columbia nanomedicine spin-off AbCellera, which was the first to co-develop an antibody therapeutic for COVID-19, we examine the capabilities enabling an academic scientist-entrepreneur to respond rapidly to health and humanitarian crises and create economic and social impact. We argue that well-endowed university spin-offs can rapidly leverage and extend capabilities for pandemic response.

Too much support? Entrepreneurial ecosystems and firm growth in the Greater Toronto Area

Shiri Breznitz¹, Qiantao Zhang², Steven Denney³

¹University of Toronto – Munk School of Global Affairs & Public Policy

²Xi'an Jiaotong-Liverpool University

³University of Vienna

This article aims to identify actors within entrepreneurial ecosystems supporting student entrepreneurship. We use a unique database containing 210 responses of student entrepreneurs subscript in entrepreneurial French centre between 2014 and 2021. Our results present the mobilization of student entrepreneurs' resources and those own by other actors within entrepreneurial ecosystem. Four sub-networks of actors providing resources to students are identified: personal, entrepreneurial support, financial, and commercial networks. We identify the influence of student profiles and project characteristics on their opening ability to mobilized resources owned by actors in sub-networks. This article proposes managerial recommendations to improve policies supporting student entrepreneurship.

Toward a continuum approach to science-based innovation and entrepreneurship in Canada

Sarah Lubik¹, James McLellan², Elicia Maine¹

¹Beedie School of Business, Simon Fraser University

²Department of Chemical Engineering, Queen's University

Innovation policies driving toward narrowly-defined metrics of success fail to account for the complexities of science-based innovation. We take a novel approach of mapping the entrepreneurial journeys of researchers, observing the role of influencers to build awareness and signal legitimacy, decision paths of scientist-innovators, tracking skills acquisition of HQP, and measuring entrepreneurial capability development. We advocate for an entrepreneurial approach to success indicators in science-based innovation: using the stages of the researcher journey, moving away from venture-oriented metrics alone as the primary measurements of success, and moving toward a non-linear, open-systems approach to success metrics for science-based entrepreneurs and ventures.

Supporting technological new ventures from the ideation to the business concept phase

Octave Niamie¹

¹École Polytechnique de Montréal

The literature on entrepreneurial support systems focuses mainly on entrepreneurs with a business concept and on their way to establishing product-market fit. Very little research focuses on supporting the entrepreneur in the

upstream phase, where the aspiring entrepreneur expresses his intention and undertakes actions to collect information to create a business concept. The main reason may be that there is too much uncertainty, and the entrepreneur does not yet know his identity at this stage. We want to understand how the aspiring entrepreneurs build their entrepreneurial space at this early stage and will use ethnographic interviews with a cohort of 9 aspiring entrepreneurs over 6 months as data collection method. Knowing the extent and nature of this space will make it possible to generate new theories on entrepreneurial support and to design appropriate support approaches for this stage. In addition to developing new theories on support, it could bring out solutions to the problem of very large gap between intention and business start-up.

WEDNESDAY 11 MAY 2022, 8H30–10H00: PARALLEL SESSIONS 3

SESSION 3A – STI POLICY FOR INNOVATION ECOSYSTEMS [MONSELLA A]

Sustainable development needs STI policy that reflects the established objectives. Lectures are about how to increase Canadian IE policy effectiveness between different levels of government, the private sector and NPOs, how digitally intensive multinational firms affect firms and workers in the local ecosystem, and incorporating industry perspectives into the innovation policy process.

Chair: Dany Brouillette

Discussant: Danny Leung

Improving the performance of Canada's innovation ecosystem: Intergovernmental collaboration and multilevel governance in Ontario

Michele Mastroeni¹, Jonathan Landon¹, Tamara Doerkson¹, Linying Dong¹, Emily Rezkalla¹

¹OCAD University

This research explores the importance of multilevel governance in Canadian innovation systems, with an empirical focus on Ontario. The research draws upon the practical experience of leaders in different levels of government in Ontario, and leaders in the private and not-for-profit sectors, to understand how different levels of government in Canada might work together more collaboratively to support business innovation. Interviewees noted challenges including no common vision/definition of innovation across Canada, regional differences complicating a common policy approach, and the dynamics of collaboration and competition within a province and levels of government. The findings indicate opportunities for increased policy effectiveness.

How do multinational digital firms affect local ecosystems? Evidence from Canada

Tazia Khushboo¹, Alexander Whalley¹, Jean-William Laliberte¹

¹University of Calgary

How do digitally intensive multinational firms affect firms and workers in the local ecosystem? To answer this, we use novel linked employer-employee data with information on digital technology use for Canada. Multinational enterprises don't adopt digital technologies based on local labor market shocks; instead, they adopt a common technology policy across firms operating globally. We instrument for local multinational firms' digital technology use with that of their foreign counterparts to identify their impact on the Canadian labor market. Our rich data allows us to identify the mechanisms through which multinational firms' digitalization produce spillover effects for workers and Canadian-owned firms.

Incorporating industry perspectives into the innovation policy process

Travis Southin¹

¹University of Toronto, Department of Political Science

Innovation scholarship emphasizes the importance of coordination between government and entrepreneurs for successful innovation ecosystems. However, there is a paucity of research on mechanisms for incorporating industry perspectives into the innovation policy process, on governance mechanisms of innovation policy generally, and on the subjective viewpoints of entrepreneurs on both topics. This paper draws on over 70 qualitative interviews with Canadian technology entrepreneurs (including members of Economic Strategy Tables) to better understand their perceptions of the policy process for crafting innovation policy, with a specific focus on illuminating how industry input informs the design and governance of innovation policy mixes.

SESSION 3B – MOBILITY / INFRASTRUCTURE INNOVATION ECOSYSTEMS [MONSELLA B]

A transition to smart mobility to ensure a sustainable future is more necessary than ever. Panelists will examine the knowledge on the governance of urban transit and the integrated mobility, the co-innovation and adoption chain risks of peer-to-peer electricity trading, the sustainable mobility IE models emerging in Québec, and the recent history of integrated design processes in Québec.

Chair: Claude Faribault

Discussant: Emmanuel Mussault

Integrated Mobility and the Governance of Urban Transit

David A Wolfe¹, Elena Goracinova¹

¹University of Toronto, Munk School of Global Affairs and Public Policy

The paper examines knowledge on the governance of new technologies to facilitate the transition towards multi-modal and integrated transit systems in urban areas. It summarizes current understanding of the being deployed in the transition to smart mobility to ensure a sustainable future that delivers greater public value for local authorities and consumers of transit services. The paper identifies the policy tools used to steer the deployment of new mobility services; it reviews the role of government and non-government actors in planning for, and delivering, new mobility solutions; and it identifies how these strategies achieve policy aims in the transport arena.

Ecosystem risks of peer-to-peer electricity trading

Mehdi Montakhabi¹, Wim Vanhaverbeke²

¹Vrije Universiteit Brussel

²University of Antwerp

Despite the appealing promises of peer-to-peer electricity trading in energy transition, scholars and practitioners struggle with identifying risks that impede the large-scale rollout of this innovation. Our research identifies co-innovation and adoption chain risks of peer-to-peer electricity trading by applying the ecosystem-risk model. As a result of thirty-two semi-structured interviews, we elaborate on ecosystem risks of peer-to-peer electricity trading. This shifts the attention from execution challenges, competitiveness, and customer insights in traditional strategy, to orchestration of partners, understanding and harnessing interdependencies. Our study offers implications for theory and practice on the effective utilization of ecosystem theory for innovations' risk assessment.

The sustainable mobility innovation ecosystem

Ricardo H. Da Silva¹

¹École Polytechnique de Montréal

This research aims to understand some of the Sustainable Mobility (SM) Innovation Ecosystems (IE) models emerging in Quebec. To this end, the author plans to carry, (1) a systematic literature review of the IE construct and on some of its governance strategies, (2) review the current SM underway in Quebec, and (3) conduct comparative case studies on these initiatives. The practical implications of this research are two, (1) support stakeholders in the IE to understand their roles and to better align their organizations to the ecosystem, and (2) help decision-makers and public authorities in designing appropriate public policies.

Drivers, barriers, and tensions in adopting innovation in construction ecosystems: The case of integrated design processes in Quebec, Canada

David Smith¹, Gonzalo Lizarralde¹, Mario Bourgault¹

¹École d'architecture, Université de Montréal

²École Polytechnique de Montréal

To better understand the factors that influence the adoption of process innovation in construction ecosystems, we explore the recent history of integrated design processes (IDP) in Quebec. We reveal how changes in information technology, design practices, and policies have driven the adoption of IDP, whereas traditional procurement and project management practices have hindered it. We expose and discuss four tensions that emerge in the construction ecosystem and suggest that changes in regulations and procurement practices are needed. Understanding how innovation emerges within institutional and ethical frameworks is key to anticipate challenges and opportunities in future changes.

SESSION 3C – INNOVATION ECOSYSTEM VALUE AND ACTORS [MONSELLA C]

IEs create shared value through sustainable and responsible innovations, by configuring in different ways (hub-centred or dispersed). The presentations focus on how involvement, alignment, governance of co-localized actors can drive shared value creation in place-based IEs, structural strengths and weaknesses of the Canadian green hydrogen ecosystem leading to business opportunities and policy implications, and impact measurement of complex changes that happen leading up to the introduction and adoption of an innovation.

Chair: Dominique Sauvé

Discussant: Catherine Beaudry

Value creation in Innovation ecosystems: the role of proximity for sustainability

Giulia Piantoni¹, Marika Arena¹, Giovanni Azzone¹

¹Politecnico di Milano, Department of Management Economics and Industrial Engineering

Innovation ecosystems create shared value through sustainable and responsible innovations, by configuring in different ways (hub-centered or dispersed). This paper focuses on place-based ones, as the effect of their physical proximity on the creation of sustainable shared value is debated in the literature: thus, the paper focuses on how involvement, alignment, governance of co-localized actors can drive shared value creation in place-based innovation ecosystems. It explores, through a deductive multiple case study analysis, four place-based ecosystems and identifies best and worst practices of value creation: overall, it emerges the need of going beyond spatial proximity, nurturing relations and trust.

Actors' positioning in an emerging innovation ecosystem – The case of green hydrogen

Michael Wustmans¹, Stefanie Bröring¹, V.J. Thomas², Elicia Maine³

¹University of Bonn, Institute for Food and Resource Economics

²The university of the Fraser Valley, School of Business

³Simon Fraser University, Beedie School of Business

Actors in innovation ecosystems have several options and strategic choices to position themselves to generate and capture value. Although literature discusses actor roles and dynamics in emerging ecosystems, it would benefit from a discussion around empirical indicators to assess actors' positioning beyond their roles. By using comparative measures within a mixed-method approach, we relate actor roles to value chain positions and innovation stages to identify reliable indicators for the assessment of actors' positioning. While applying our measures to the Canadian green hydrogen ecosystem, we uncover structural strengths and weaknesses of the ecosystem leading to business opportunities and policy implications.

Product value chains illuminate innovation impact pathways

Gretchen Jordan, 360 Innovation LLC

The complexity of measuring, whether prospectively, in real time, or after-the-fact, the complex changes that happen leading up to the introduction and adoption of an innovation, be that a new product, process, policy, or practice, is considerable. The surrounding ecosystem can be represented in a value chain – the full range of activities which are required to bring a product from conception through to delivery to consumers and disposal after use. This paper discusses and shows examples of the use of value chains in evaluation: the metrics and questions to be investigated, and one data collection and analysis approach.

Internal and external alignment activities of an emerging innovation ecosystem - The case of cultured meat ecosystems

Kra Kouadio Kouassi¹, Majlinda Zhegu¹, Xavier Olleros¹, Ingela Sölvell²

¹Université du Québec à Montréal

²Uppsala University

Leading to commercialization a radical innovation through innovation ecosystem strategies is of interest to organizations. Still, knowledge of the alignment of innovation ecosystems during the critical phase of emergence remains limited. Our study contributes to a better understanding of the internal and external alignment activities of an emerging innovation ecosystem. It targets the types of activities, impacts and dynamic of alignment implemented as well as the actors, their ways, and mechanisms of interactions. The study analyzes alignment



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activities within three emerging innovation ecosystems in the field of cultured meat using the critical incidents method.