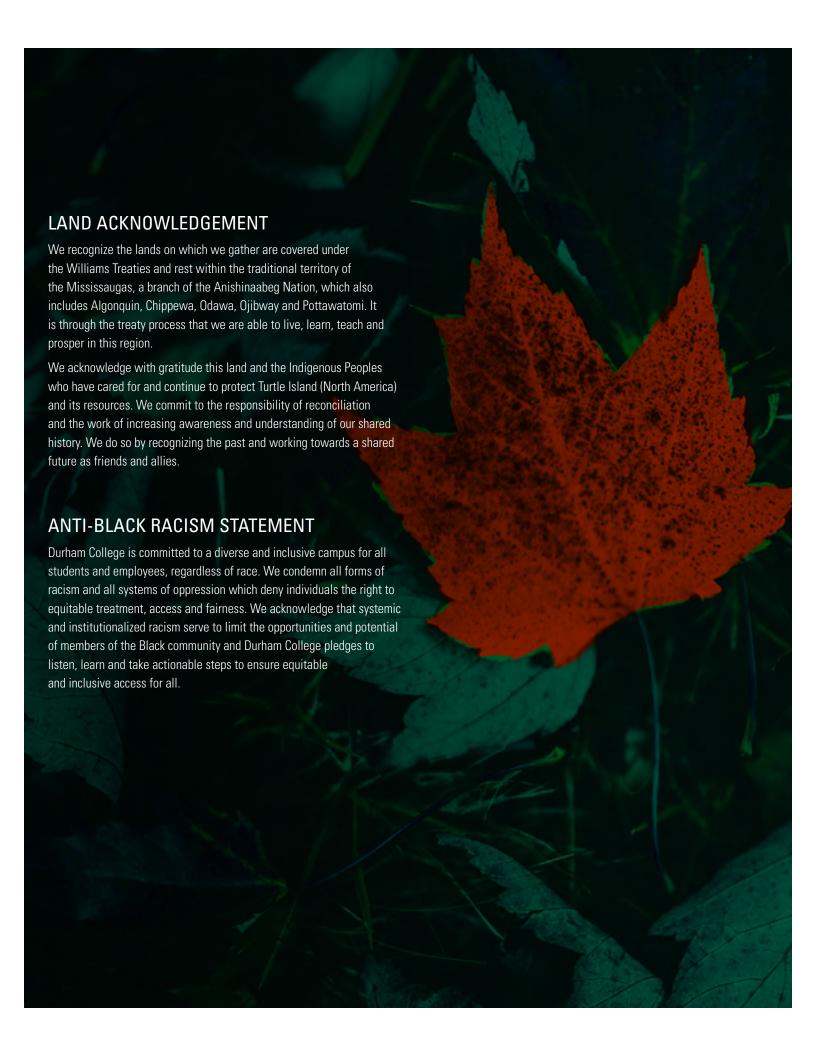




# ANNUAL REPORT

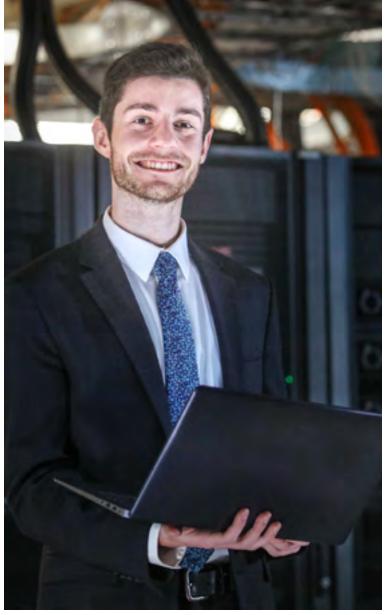
2023-2024



## **CONTENT**

Message from the AVP Innovation and Research	
Our Team	7
Commitment to Equity, Diversity and Inclusion	9
Institutional Research and Planning	10
Experiential Learning Hub	12
Entrepreneurship	14
Applied Research	16
Researcher Awards of Excellence	17
Research Coordinators	17
Social Impact Hub	20
Mixed Reality Capture Studio	24
Centre for Cybersecurity Innovation	26
Centre for Craft Brewing Innovation	28
Automated Vehicle Applied Research	30
Al Hub	32
IP Mobilization	34
Responsible Conduct of Research report	34
Research Ethics Board	35
Knowledge Mobilization	38
Contact us	43







## MESSAGE FROM THE AVP INNOVATION AND RESEARCH

I am immensely proud to present the 2023-24 Annual Report for the Office of Research Services, Innovation and Entrepreneurship (ORSIE). This past year has been rewarding on so many levels. The April 2024 grand opening of the new Centre for Innovation and Research (CIR) marked a significant milestone, establishing Durham College's research centres as innovation leaders in the community and beyond, and providing dedicated workspace and collaboration spaces for the entire ORSIE team. CIR has already become a significant showpiece and gathering hub for the college community.

I invite you to immerse yourself in the highlights of the past year. ORSIE has proudly supported new program growth, increased the availability of experiential learning opportunities for students, enhanced services to local businesses with intellectual property advisory services, and supported more student entrepreneurs than ever before.

As I look ahead, ORSIE will soon embark on a new strategic research plan, in line with the College's broader strategic planning process, providing an exciting opportunity to develop a path forward that is focused on growth, innovation, and student success. The future is bold and exciting, fueled by the creative imagination of the committed ORSIE team and backed by our steadfast Durham Region innovation ecosystem partners. Together, we're leading the way.

**Debbie McKee Demczyk**, AVP Innovation and Research

















## OFFICE OF RESEARCH SERVICES, INNOVATION AND ENTREPRENEURSHIP

The Office of Research Services, Innovation and Entrepreneurship (ORSIE) facilitates entrepreneurship, applied research, institutional research and experiential learning to address community challenges. We engage faculty, students, external partners and the community-at-large in projects that make an impact through collaboration and innovation.

#### **OUR TFAM**

Dr. Joshua Cohen, commercialization specialist

Madison Gulenchyn, communications assistant

Debbie McKee Demczyk, AVP Innovation and Research

Megan Parker, research financial analyst

Anabel Reyna, administrative assistant

Kristina Svana, research and marketing specialist

Jennifer Wallace, ethics compliance, training and inclusion coordinator

#### **EXPERIENTIAL LEARNING HUB**

Camille Bacaksizlar, co-operative education coordinator

Amanda Brown, director

Dania Buttu, project coordinator, Work Integrated Learning

Danielle Crosby, project coordinator, Experiential Learning

Anna De Grauwe, manager

Jason Patterson, industry liaison

Allana Persaud, industry liaison

Erin Sawyer, co-operative education coordinator

Chen Zheng, project coordinator, Experiential Learning

#### **INSTITUTIONAL RESEARCH AND PLANNING**

Joshua Gerrow, junior research analyst

Rashmi Gupta, director

Matthew Hack, manager

Melanie Hewitt, director

Xuan Pan, research and planning analyst

Erin Shanahan, research and planning analyst

Vanessa Snead, research and planning analyst

#### **ENTREPRENEURSHIP**

**Jennifer Bedford**, faculty advisor, Faculty of Media, Art and Design

Danielle Harder, faculty advisor, Faculty of Media, Art and Design

Sundar Manku, manager entrepreneurship services

Sara Mercier-Priebe, faculty advisor, Faculty of Business

Katherine Sampson, business services specialist

#### APPLIED RESEARCH

Isabella Blandisi-Van Hee, operations manager

Dina Samaha, project coordinator

Vibha Tyagi, director, Applied Research

#### **SOCIAL IMPACT HUB**

Sara-Ruth Allen, project coordinator

Colleen McKay, manager, Grants and Special Projects

#### **MRC STUDIO**

Harrison Forsyth, principal investigator

John Goodwin, head of creative / technology

Jason Hunter, senior manager

Robert Kozak, technician

Ryan Miller, manager

Kassandra Soda, principal investigator

#### CENTRE FOR CYBERSECURITY INNOVATION

Sushant Katare, senior manager

Robert Kozak, technician

Priyanka Sharma, principal investigator

#### **CENTRE FOR CRAFT BREWING INNOVATION**

Mike Aylward, master brewer

Dirk Bendiak, principal investigator

Chris Gillis, manager, Applied Research Business Development

#### AI HUB

Natalie Arthurs, senior manager

Carol Guo, principal investigator

Abhilash Marecharla, principal investigator

Amber Moores, industry liaison

Navaneeth Ramanathan Jawaharlal Nehru, principal investigator

Saba Siddiqi, research lead

Tejas Vyas, principal investigator

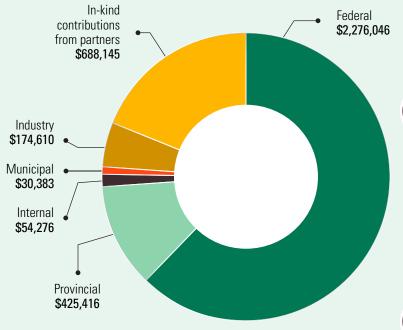
Melissa Yee, principal investigator

Terence Yu, principal investigator

## IN 2023-24 ORSIE LEVERAGED \$3,648,876 IN FUNDING FROM A VARIETY OF SOURCES TO SUPPORT 78 PROJECTS

#### **FUNDING SOURCES**

TOTAL= \$3,648,876



#### WHO IS INVOLVED?

Faculty members	13
Students	98
External partner organizations	58
External hires (Principle Investigators, Research Associates, Technicians, Post Doctoral Fellow)	46



#### **INTELLECTUAL PROPERTY**

Investing over \$100,000 in innovative business clients, the program has:

- benefited over 50 small-to-medium sized enterprises (SMEs) in its first year, and resulted in:
- 8 patent applications
- 2 trademark applications
- and several patent licensing and non-disclosure agreements





#### **EXPERIENTIAL LEARNING**

482 students in 23 different projects benefitted from experiential learning experiences supported by the Experiential Learning Hub.

#### WHERE THE FUNDS GO

RESEARCH CENTRE/AREA	CASH	IN-KIND
Al Hub	\$914,027	\$278,750
CCBI	\$251,151	\$27,198
Centre for Cybersecurity Innovation	\$508,250	\$82,700
MRC Studio	\$350,315	\$98,500
Social Impact Hub	\$122,563	\$20,428
OVIN	\$119,516	\$60,000
Experiential Learning	\$339,759	\$120,569

#### **OUR FUNDERS:**





















## COMMITMENT TO EQUITY, DIVERSITY AND INCLUSION The Office of Research Services, Innovation and Entrepreneurship (ORSIE) is committed to fostering an inclusive environment and supporting research that recognizes the diverse perspectives of our team and surrounding community, including Indigenous peoples, 2SLGBTQIA+ persons, persons with disabilities, racialized persons, women and other marginalized genders. **Dimensions**Charter endorser

# INSTITUTIONAL RESEARCH AND PLANNING

To support evidence-based planning and decision-making, Institutional Research and Planning (IRP) collaborates with various college departments to provide the data, analysis, and information necessary for institutional planning, policy setting, and academic and management decisions.

Championing the data-driven culture at Durham College, IRP develops and updates student and program-related interactive data visualizations that are disseminated through the IRP centralized *Insights* portal. In addition, the IRP team embarked upon a new outreach strategy including:

#### HIGHLIGHTS

The IRP team contributed to Strategic Enrolment Management at DC through the Enrolment Advisory Committee and the Enrolment Management Group. To support DC's needs, IRP conducted multiple strategic analysis projects to investigate trends in applications and enrolments. This resulted in the development of a first-of-its-kind dashboard based on system-level applicant data. This dashboard has been shared with the Academic Leadership Team, Communications and Marketing, and the Registrar's Office Admissions team, providing timely and critical information to develop targeted efforts to optimize enrolment.

The IRP team supported the development of new programs, creating comprehensive environmental scans and student, graduate and employer surveys.



The **Student Feedback Questionnaire** (SFQ) is an important quality assurance effort that provides timely information for formative faculty feedback. The IRP team enhanced the administration through an updated communications plan and training session. In addition, the IRP team supported the re-introduction of student comments and deployed a new 360° module to support its efforts in 360° feedback, a constructive feedback mechanism that allows individuals to understand their performance.

The IRP team continued to evaluate and support the 2020-25 Strategic Mandate Agreement and plan for subsequent years. IRP successfully collaborated with the Ministry of Colleges and Universities to adjust historical metrics to more accurately capture changes to the programs at the College.











#### EXPERIENTIAL LEARNING HUB

The Experiential Learning (EL) Hub supports students in gaining handson learning experience and developing employability skills. The EL Hub connects employer partners with students to solve problems and address hiring needs while advancing student learning and career readiness.

#### HIGHLIGHTS

#### **DIANE BLAKE STUDENT SUCCESS INITIATIVE**

This year the EL Hub received a transformational \$2 million gift from philanthropist Diane Blake to create the Diane Blake Student Success Initiative (DBSSI) that supports the development of essential employability skills designed to help students launch their careers. It is accelerating DC's goal of developing co-operative education components in all appropriate programs and increasing the number of employer partners, enabling all eligible and interested students to participate in work-integrated learning (WIL) opportunities. It is supporting the acquisition of technology to develop students' soft skills related to job search and the workplace. Students facing barriers to participation in WIL opportunities — such as costs related to transportation or accommodation, childcare, personal protective equipment or uniforms — are eligible for financial support through the DBSSI.

#### **CO-OPERATIVE EDUCATION UPDATES**

As part of the expansion of co-operative education, co-op and work term options were launched in five programs: Cloud Computing, Data Analytics for Business Decision Making, Fire Prevention and Technology, International Business Management, and Project Management, with work underway to support the addition of nine new programs in 2024-2025.

To support brand new co-op and work term students, a Co-op Student Orientation was launched in fall 2023. This event introduces new students to their co-op coordinator as a key supporter of their job search and highlights co-op expectations along with tips and strategies for success. Student attendees had the chance to practice networking skills, an activity encouraged for all co-op students during their job search.

#### WIL STUDENT OF THE YEAR



#### **ANDREW NEARY**

In February 2024, second-year Journalism — Mass Media student, Andrew Neary, was recognized as WIL Student of the Year (College) for both Experiential & Work-Integrated Learning Ontario (EWO) and Co-operative Education & Work-Integrated Learning (CEWIL) Canada. Andrew earned both provincial and national honours for his outstanding performance and commitment to work-integrated learning.



EXPERIENTIAL LEARNING PROJECTS FUNDED BY CO-OPERATIVE EDUCATION AND WORK-INTEGRATED LEARNING (CEWIL) CANADA AND THE GOVERNMENT OF CANADA'S INNOVATIVE WIL (I-WIL) PROGRAM

NUMBER OF PROJECTS	9
NUMBER OF STUDENTS	315
AMOUNT AWARDED	\$450,000

Supported by CEWIL funding, the Enactus project Founder's Drive Season 2 enabled 15 students to visit the Indigenous community of Akwesasne. Students learned about Indigenous culture and the complexities of this community while fostering friendships with youth and leaders and enhancing technical skills including storytelling, audio editing, intercultural communication and event photography/videography skills.









#### **TEACHINGCITY**

NUMBER OF PROJECTS	10
NUMBER OF STUDENTS	89

In the Pre-Service Education and Training: Improving the Health, Safety and Fitness for a Future Generation of Firefighters project, TeachingCity and CEWIL funding support Firefighter Pre-Service students to participate in realistic fire simulations, while measuring vital physiological responses. They underwent the treadmill VO2max test, a prerequisite for Ontario firefighting job applications, and received valuable performance feedback. Students also gained practical experience with metabolic testing, which enhanced their academic learning with hands-on application.

### CITYSTUDIO DURHAM

#### **CITYSTUDIO**

NUMBER OF PROJECTS	4
NUMBER OF STUDENTS	78

Through the Voices in Durham, Voices in Journalism project, supported by CityStudio Durham as well as CEWIL, students increased their civic engagement and journalism skills by learning to tell balanced stories and improving diverse representation in newsrooms. Students gained an understanding of the current labour market by attending a conference focused on the future of news and meeting executives and leading journalists. Students learned about the principles of Equity, Diversity, Inclusion and Belonging from diverse community members and professional journalists and will apply those values in their future journalism activities.

## **ENTREPRENEURSHIP**

# FAST START

DC's FastStart Entrepreneurship Centre empowers students to develop and launch their own businesses. Available to students across all programs, this comprehensive service offers opportunities to raise funds, participate in pitch competitions, receive one-on-one mentorship, and access essential resources such as professional-grade cameras, a photo studio, 3D printers, and a laser engraver. Over the past year, students have successfully secured thousands of dollars in non-repayable grants, established free websites for their businesses through our unique partnerships, and engaged with angel investors to receive feedback on their ventures.

#### HIGHLIGHTS

#### **PITCH COMPETITIONS**

Two incredible Pitch Competitions were hosted at Durham College, providing a platform for our student entrepreneurs to showcase innovative ventures. Notably, over half of the participating ventures were women-led. Participants vied for a chance to win up to \$1,000 and an iPad, courtesy of the generous support from the Durham College Student Association. Inspiring students presented entrepreneurial ideas to our esteemed panel of judges:

Andrew Ko, Futurpreneur

Ivan Cheung, Invest Durham

Kristen Marumoto, Durham's Neighborhood Association of Angel Investors

Travis Dutka, 360insights

Kaila Dimopoulos, 1855 Whitby

Frank Auddino, Angel Investors Durham

Connor Loughlean, Brilliant Catalyst, Ontario Tech University

Marc Ford, Durham College, Faculty of Business

#### STUDENT ENTREPRENEUR SPOTLIGHTS



EmpowHer, created by Rochelle Palmer (Fitness and Health Promotion student) is a fitness enterprise that incorporates onsite licensed therapist and daycare center specifically for women experiencing postpartum depression. EmpowHer came first place at the January Pitch Competition!



Ostome Fashion, co-founders Paula Sojo (Video Production student) and Daniel Sojo develop innovative ostomy bags that seamlessly blend with everyday fashion and redefine ostomy care, empowering individuals to live life to the fullest. Ostome Fashion came in first at the April Pitch Competition!



Kuwota co-founders Kinen Ocitti (Data Analytics for Business Decision Making and Computer Programming Analyst Graduate) and Samuel Mutumba (Advanced Diploma, Computer Programming and Analysis Graduate), created a mobile application that promotes personal growth through digital journaling, leverages AI to provide feedback and can connect users to certified therapists. Kuwota received a \$3,500 grant from Tomorrow's Leaders Starting Out.

"When I approached FastStart, I came with a block of marble. I knew I wanted to do something with it, but I didn't know what to do or how to do it. FastStart really helped me sculpt the edges."

- Kinen Ocitti, Kuwota co-founder

#### **NOTABLE EVENTS**



#### **CYPHER: BLACK MALE EMPOWERMENT CONFERENCE**

June 2023

400 students in Grades 7 to 10 from the Durham District School Board visited the Oshawa campus. As part of the conference, FastStart hosted the students for a workshop on Design Thinking and overview of entrepreneurship.



#### **EMPOWERMENT THROUGH** SKILLS PROGRAM (ESP)

October 2023

ESP is designed to strengthen alternative pathways to education, employment, self-employment, and entrepreneurship for women and adolescent girls by working with Folk Development Colleges and Community-Based Organizations in 12 communities across Tanzania. The FastStart team provided support to develop and revise the existing entrepreneurship curriculum for girls and young women, travelling with the ESP team to Tanzania in October 2023 to conduct research.



#### **EMPOWERING WOMEN** ENTREPRENEURS WOMEN'S SPEAKER **SERIES FOR #DOITINDURHAM**

November 2023

Attendees gained valuable insights from inspiring women leaders who discussed their experiences, strategies for overcoming obstacles, and tips for thriving in the business world.



#### **FASTSTART MARKETS**

October 2023, December 2023, February 2024

FastStart hosted three student markets across five days, giving entrepreneurs a chance to make their first sales! Over 60 businesses, including Durham College Alumni, had the opportunity to sell their products and services to the DC Community.



**PROJECTS** 

5,200+

A student-led initiative, Enactus focuses on creating social enterprises dedicated to addressing the United Nations' 17 sustainable development goals. Students have the chance to establish or join a social enterprise and compete against other post-secondary teams in regional and national competitions at the end of the academic year. These competitions allow teams to showcase their innovative solutions and projects, demonstrating how they tackle social, economic, and environmental issues within our communities, with the opportunity to win cash prizes.

One notable project stemming from Enactus is Just Dandy, aimed at promoting sustainable living and financial literacy across the Durham Region.

Another successful venture is *Founder's Drive*, a podcast offering insights into the challenges faced by young entrepreneurs. Founder's Drive earned first place in the Regional Competition in both 2023 and 2024. For season two of the podcast, the team focused on Indigenous Entrepreneurs and had the opportunity to visit Akwesasne to meet with and interview local business owners

## APPLIED RESEARCH

## COMMITMENT TO EQUITY, DIVERSITY AND INCLUSION

#### TRAINING:

To ensure all the work, research and engagements of ORSIE are grounded in EDI principles and considerations, our employees and partners have been provided with several annual training opportunities on EDI best practices. This year:

10	EMPLOYEES ATTENDED EDI IN RESEARCH TRAINING
22	EMPLOYEES ATTENDED DISABILITY INCLUSION TRAINING
22	EMPLOYEES ATTENDED THE FUNDAMENTALS OF OCAP® TRAINING
9	PRINCIPAL INVESTIGATORS LEADING APPLIED RESEARCH PROJECTS ATTENDED UNIVERSAL DESIGN FOR LEARNING (UDL)FOR INCLUSION, DIVERSITY, FOULTY AND ACCESSIBILITY TRAINING

Through the expansion of the required trainings for all new student Research Assistants, Research Associates and Principal Investigators, ORSIE is now also able to ensure all employees and associated researchers have completed the EDI in Pedagogy and Practice training, the DC Indigenous Histories and Reconciliation modules and the Tri-Council Policy Statement-2 Course on Research Ethics training modules, which includes sections devoted to ethical considerations when working with Indigenous communities.

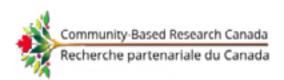
#### **INITIATIVES:**

Through the Social Impact Hub, ORSIE staff and faculty collaborators spearheaded a planning committee organizing events for the nationwide Colleges EDI in Research Community of Practice, including the immensely successful March 21 event titled, "Embedding EDI Principles in Research Projects." ORSIE staff also continue work to embed EDI principles within all activities, drafting an ORSIE EDI Action Plan and developing a Durham College Data Management Plan Template grounded in OCAP® Principles.



#### **COMMUNITY CONNECTIONS:**

ORSIE's applied research hubs are committed to developing inclusive research environments which continue to create space for meaningful engagement with the diverse Durham Region community. Connections have been made with organizations such as the Canadian Gay and Lesbian Chamber of Commerce, the Canadian Black Chamber of Commerce, and the Canadian Hispanic Latin American Virtual Museum. The past year has also fostered the development of numerous collaborations with diverse community groups, including the Black Health Alliance, the Community Development Council of Durham, the Health Research Council for People of African Descent, Ontario Shores Centre for Mental Health Sciences, and the Abilities Centre.





#### CONGRATULATIONS TO OUR 2023 RESEARCH **EXCELLENCE AWARD WINNERS!**



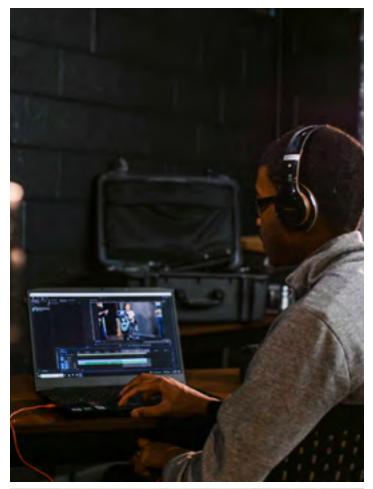
#### **EMERGING RESEARCHER AWARD: AMANDA CAPPON**

Throughout her career, Amanda has shown unwavering commitment to addressing societal challenges through her impactful research. As co-lead, Amanda received a three-year grant from the federal College and Community Social Innovation Fund to develop a support model for parents with cognitive challenges which aims to strengthen families and their surrounding support systems with the goal of keeping families together. This project not only highlights her innovative approach to social issues. but also her dedication to creating real-world solutions that enhance the lives of vulnerable populations.



#### **EXPERIENCED RESEARCHER AWARD: LORRAINE CLOSS**

Lorraine continues to uphold a standard of excellence in research, having successfully led or co-led numerous Community-Based research grants that address equity challenges and foster social innovation within our communities. She ensures the voices of those with lived experience are central to the research process by fostering strong partnerships with community agencies and undertaking co-production methodologies.







#### RESEARCH COORDINATORS

Research Coordinators are faculty members who devote time and expertise to facilitate research opportunities within their respective faculties. Throughout the academic year, research coordinators provide input and support needed to execute a variety of research-related capacity building activities across disciplines alongside ORSIE staff members. ORSIE extends a huge thank you to the 2023-24 Research Coordinators:

Teresa Avvampato, Faculty of Health Sciences

Jennifer Bedford, Faculty of Media, Art and Design

Amanda Cappon, Faculty of Social and Community Services

Lynne Kennette, Faculty of Liberal Studies

Aria Perez, Faculty of Science, Engineering and Information Technology

**Wendy Smith**, Faculty of Hospitality and Horticultural Science; and Faculty of Skilled Trades and Apprenticeship

Kelly Webdale, Faculty of Business



#### **KEY INITIATIVES LED BY THE RESEARCH COORDINATORS THIS YEAR:**

#### STUDENTS OF APPLIED RESEARCH (SOAR) **COMMUNITY OF PRACTICE**

Student Research Assistants were invited to attend the launch event for a Community of Practice to share experiences engaging in research activities at the college. Students attending the event shared their passion for research with one declaring, "It's a no-brainer! If you get the chance [to become involved in research], you have to take it 100% because it is very useful." The CoP conversation continues on a MS Teams channel and other platforms for engagement and future events are being explored.



#### INTRODUCTION TO APPLIED RESEARCH LEARNING MODULE

This learning tool was designed for student research assistants and researchers interested in learning about applied research at Durham College and can be useful for any student or faculty member interested in learning more about applied research. Students can self-register on the DC Connect platform and faculty can add the module to their curriculum. Topics include:

- Introduction to Applied Research
- The Role of Research Assistants at Durham College
- Transitioning from Research Idea to Research Question
- The Research Process
- Dissemination of Results
- Fundamentals of Applied Research workshop series



#### FACULTY APPLIED RESEARCH WORKSHOPS

For the second time, professional development workshops were provided in Spring 2023 to faculty members interested in learning about applied research at Durham College. The series led participants through the applied research process over seven weekly 2-hour sessions. Session topics included: generating research ideas, project design and applying for funding. The participants expressed appreciation for the learning and collaboration opportunity, with many exploring future projects.

#### FACULTY APPLIED RESEARCH MENTORSHIP PROGRAM

The mentorship program was designed to support both new and seasoned full-time faculty members by connecting them with an experienced faculty researcher who provides guidance and support in research-related skills. The program was piloted this year with three mentorship pairings taking place. The feedback from participants will enable program improvements moving forward.



#### **SOCIAL IMPACT HUB**

By leveraging faculty expertise, student talent and strong community partnerships, the Social Impact Hub seeks to identify creative solutions to complex social challenges through leading-edge applied research projects and service-learning initiatives.





### PROJECT UPDATES: COLLEGE AND COMMUNITY SOCIAL INNOVATION FUND



#### INNOVATION THROUGH CO-PRODUCTION

Project leads: Corrine McCormick-Brighton, Nicole Doyle

Community partners: The Regional Municipality of Durham - Children's Services Division, EarlyON/YMCA of Greater Toronto, Ontario Tech University

Brought together parents of pre-school children, Early Childhood Educators, and early childhood experts at co-design workshops focused on ways to support the development of social competence skills in pre-school children. Co-created a social competence skills-building resource kit and piloted the kit in four EarlyON Child and Family Centres in Durham Region.







Project leads: Dr. Michael Williams-Bell, Harrison Forsyth

Community partner: Oshawa Fire Service, City of Oshawa

Supported by the MRC Studio, the team developed an initial prototype of a search and rescue simulation that incorporates core body temperature to visualize the impact of heat stress on firefighter trainees. Designed to improve training efficacy and safety for firefighters, further versions of the simulation will include visual and auditory stimuli encountered by firefighters during an uncontrollable building collapse scenario.



#### **BUILDING BRIDGES TOGETHER**

Project lead: Lorraine Closs

Community partners: The Regional Municipality of Durham, Oshawa Public Libraries, North House, Durham Workforce Authority, Durham Region Unemployed Help Centre, Durham Community Legal Clinic, Iriss - Scotland, Abilities Centre, 211 Durham, Prosper Canada, Canada Revenue Agency, Congress of Black Women—Ajax/Pickering chapter, New Immigrant Welcome Centre, Back Door Mission, Durham Community Health Centre, Community Development Council Durham, **GAP Committee** 

During three co-design sessions, people with lived experience of poverty and community service providers collaborated to create three social innovations aimed at breaking down access barriers to financial literacy and services for people experiencing low income. The innovations include a board game for youth, a video game prototype, and a touchscreen kiosk.



#### RAISING RESILIENT FAMILIES

Project leads: Amanda Cappon, Kay Corbier

Community partners: The Regional Municipality of Durham, Huntington Society of Canada, Starfish Parent Support Program, Durham Association for Family Resources and Support, Durham Children's Aid Society, Brock University, University of Toronto, Perinatal Wellbeing Ontario, Community Living Oshawa/Clarington and Lake Ridge Community Support Services

Service providers and expectant parents attended co-production sessions to build a model of support for parents with cognitive challenges. Hired Parent Educators to help develop parenting skills of expectant parents with cognitive challenges using Step-by-Step Parenting Program and Simulator Dolls. Once a baby arrived, the Parent Educator continued to provide support while the research team assessed the parent's application of skills learned from the Program to their baby.



SUPPORTED BY THE **SOCIAL IMPACT HUB** 



SOAR Students Of Applied Research





#### STUDENTS OF APPLIED RESEARCH (SOAR):



"This is someone's brother, mother, son, daughter, friend and they are more than the label that people put on them. This was a life-changing experience, and I am very thankful to have gotten the chance to work on it."

- Simran Deb, Journalism student



#### SURVIVING ADDICTION DOCUSERIES

Through the Social Impact Hub, Durham College students and staff filmed and co-produced the series alongside creator (and DC Alumnus) Chris Cull over the summer and fall of 2023. Chris has been passionately raising awareness of addiction and mental health through his activities at *Inspire by Example* and by sharing his own experience. The series was created with the help of the Canadian Society of Addiction Medicine and highlights the humanity behind addiction and how it affects individuals and those supporting them. The series aims to shed light on the devastating effects of addiction as well as the power of compassion and resilience.



"Working on the docuseries helped develop my communication and teamwork skills. I was also able to work alongside other creatives and like-minded people."

- Ayomide Kuye, Video Production student





#### MIXED REALITY CAPTURE STUDIO

The MRC Studio opens doors for industry partners to harness technical expertise, student talent, and an innovative motion capture stage. With one of only three Captury Live systems in Canada, the studio empowers businesses to create immersive applications integrating motion capture, virtual reality, augmented reality, and virtual production.



#### MRC STUDIO GRAND OPENING

On April 27, 2023, the cutting-edge Mixed Reality Capture Studio was unveiled in its new home in the Centre for Innovation and Research demonstrating Durham College's commitment to pushing the boundaries of immersive experiences.

The MRC Studio boasts state-of-the-art equipment, including a variety of virtual and augmented reality devices, the ArchTech Leo, a powerful tool for 3D scanning, and at its centre, a markerless Motion Capture System powered by Captury Live technology. With only four installations in Canada — two at DC — this sophisticated system underscores Durham College's leadership in motion capture technology. Through this system, students, researchers and collaborative partners have access to unparalleled resources enabling exploration of the intricacies of human movement and interaction in virtual environments.

Attendees were treated to captivating demonstrations, showcasing the MRC Studio's capabilities in transforming ideas into virtual realities. Moreover, the introduction highlighted a dedication to fostering innovation in digital imaging technologies.



#### CONTINUED IRAP RELATIONSHIP TO SUPPORT SMES IN GAME DEVELOPMENT

Fossil Hunters by Reptoid Games was developed with expertise from the MRC Studio and its launch marked a significant turning point for the MRC Studio, igniting a surge of interest from small and medium-sized enterprises (SMEs) across Canada. This pivotal moment solidified the Studio's reputation as a hub for innovation but also catalyzed fruitful collaborations facilitated by the National Research Council Industrial Research Assistance Program (IRAP).

The success of Fossil Hunters not only bolstered the Studio's credibility but also positioned it as a beacon for game development companies nationwide. This newfound recognition attracted the attention of game development firms from all corners of Canada, eager to tap into the Studio's expertise and resources. Through strategic partnerships and continued support from IRAP, the MRC Studio has expanded its network within the Canadian gaming industry.

#### **INDUSTRY DAY**

On January 18, 2024, the MRC Studio hosted its first ever Industry Day, heralding a new era of collaboration and innovation in the realm of Virtual Production. This ground-breaking occasion served as a platform for industry partners, esteemed researchers, and budding students to converge and explore the dynamic landscape of Virtual Production and Game Development.

#### SPOTLIGHT:



#### JASON HUNTER, SENIOR MANAGER

Jason Hunter joined the MRC Studio as Senior Manager in February 2024, bringing with him over a decade of diverse experience in Virtual Production, Film, Television, and Motion Capture. His background includes six years of academic research, adding depth to his practical knowledge.

Jason's goal is to advance new technologies and foster innovation at Durham College. He is particularly interested in blending technologies for fresh storytelling approaches, making technology more accessible, and expanding film and TV workflows into new sectors. With a focus on practical solutions and collaboration, Jason is poised to drive positive change and explore untapped potentials in the industry.



#### STUDENTS OF APPLIED RESEARCH:



#### **JAIDE BUTT**

Jaide has been a valued member of the MRC Studio since early into her second year as a Game - Art Student. She started by focusing on game testing for Ontario Game Testers and animating and rigging characters on the indie game "Krog" by Reptoid Games. Her research efforts on Krog were not limited to animation, as she began to increase her knowledge by learning to use the Unity game engine.

Specializing in animation, Jaide was ecstatic to be trained as a specialized operator of the MRCs state-of-the-art markerless motion capture system, Captury Live. This opportunity opened a new career path for Jaide as she now has plans to work as a motion capture technician and cleanup specialist for film, television and video games.





#### CENTRE FOR CYBERSECURITY INNOVATION

The Centre for Cybersecurity Innovation leverages advanced research equipment and expert staff to develop technologies for cyber range deployments, threat intelligence, anomaly detection, and incident management. The Centre works with partners to consistently address vulnerabilities, promote best practices, and effectively safeguard organizations against emerging threats.

#### PROJECT HIGHLIGHTS:

## PROACTIVE DATA PRIVACY AND GOVERNANCE SOLUTION FOR DIGICONTROL

Organizations struggle with accurately identifying and safeguarding sensitive data amid evolving cyber threats. Traditional solutions relying on predefined rules and keyword scanning often fall short in providing comprehensive data protection.

The Centre for Cybersecurity Innovation is developing a proactive, Aldriven solution for their client Digicontrol. Through this collaboration, a minimum viable product (MVP) will showcase key technologies like pattern recognition for data classification, email monitoring, mobile app notifications, and an Al module for continuous improvement.

The solution takes an innovative approach, employing advanced machine learning to autonomously analyze data patterns and intelligently identify Personal Identifiable Information / Protected Health Information. This enables more accurate and scalable confidential information detection compared to traditional methods. Moreover, its continuous learning capabilities allow the system to adapt and improve over time, providing a proactive defence against evolving cyber threats for Digicontrol.

## EXECUTIVE CYBERSECURITY AWARENESS WORKSHOP: EMPOWERING LEADERS WITH CYBER-READINESS

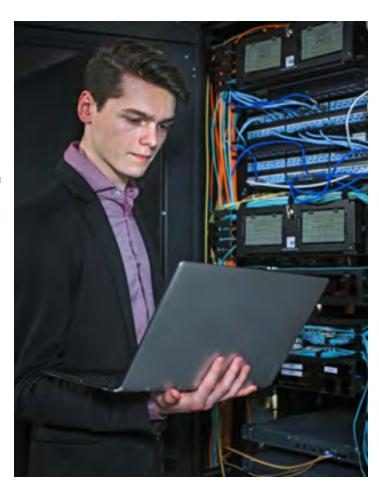
This one-day, in-person workshop featured engaging presentations, tailored tabletop simulations, case study discussions, and a focused assessment. Designed to provide executives with actionable strategies for fostering a cyber-aware culture, it included the innovative game CyberSnakes. This interactive game immerses participants in a simulated environment, allowing them to make decisions and see the consequences in a gamified setting. By exploring scenarios, analyzing threats, and implementing strategies, CyberSnakes enhances cyberawareness and develops critical thinking and decision-making skills essential for effective cybersecurity leadership.



#### STUDENTS OF APPLIED RESEARCH:

#### **NEETHU RAGHAVAN**

Neethu Raghavan, a postgraduate in Computer Science, joined the Centre while pursuing a Graduate Certificate in cybersecurity at Durham College. With her proficiency and interest in writing and knowledge in cybersecurity standards, she worked with municipalities in the Durham Region on projects modifying and creating cybersecurity procedures and policies. She is a keen learner and works closely with team members to collaborate and share her knowledge in vulnerability assessments and documentation.











#### **SPOTLIGHT**: SUSHANT KATARE, SENIOR MANAGER

This year, Sushant Katare, a Certified Information Systems Security Professional (CISSP) with over 11 years of experience, joined the ORSIE team as Senior Manager for the Centre for Cybersecurity Innovation. With a proven track record of building successful teams, products, and businesses from the ground up, Sushant has designed, developed, and launched six security products and solutions serving more than one million customers.

In this leadership role, Sushant created multiple standard cybersecurity service offerings, including a "Cybersecurity Starter Pack" tailored specifically for start-up companies. Additionally, Sushant initiated a strategic association with an Angel Investor group in Durham Region to provide cyber due diligence services. Recognizing the importance of collaboration, he led efforts to create synergies between various cybersecurity organizations and the Centre. By analyzing current cyber market requirements, he led the team in developing security awareness training programs as well as a C-Suite training program that emphasizes the importance of building a cyber-aware culture within organizations.



#### CENTRE FOR CRAFT BREWING INNOVATION

Supported by an experienced microbiologist and an experienced brewmaster, the CCBI has expanded services offered to support not only craft breweries, but craft cider, craft wine, craft distilleries and other craft fermented beverage makers. The CCBI provides lab testing and analysis supporting quality and consistency, new product development and/or product rejuvenation, plus artisan beverage quality management system implementation support services. The CCBI works with companies that are eligible for government funding in obtaining funds for their projects or can offer these services on a fee for service bases.

As part of the project, Elliot Brethelet, a graduate of the Horticulture Food and Farming program, developed an Equity, Diversity, and Inclusion series of practices for craft breweries.

All brewery partners were instrumental in the success of this project. CCBI worked with four craft breweries: Split Rail on Manitoulin Island, Vimy Brewing in Ottawa, Haven Brewing in Peterborough and Muddy York in Stouffville, with the latter receiving a Brewery of the Year Award from Beer Canada. Their active participation not only benefited them but also contributed to improving the management of product quality. Their valuable feedback has been crucial in making the QMS tools more user-friendly. The project will conclude with the handover of a 200-document library of templated standard operating procedures, forms and worksheets that breweries can customize to reflect their unique operations before they are given to the provincial associations in Ontario, Alberta and New Brunswick for industry implementation later in 2024.

#### CANADIAN CRAFT BREWERY QUALITY PROJECT

CCBI completed the final year of a NSERC Applied Research and Technology Partnership-2 funded project, developing and piloting a Craft Brewery Quality Management System (QMS) in collaboration with Niagara College, Olds College and the Community College of New Brunswick. The project involved DC students from the Horticulture – Food and Farming program and several lab-oriented programs from the Faculty of Science, Engineering & Information Technology (SEIT).

Canadian craft brewers are known for their creativity and innovation, emphasizing the importance of maintaining quality and consistency. This project was designed to assist provincial craft brewery associations and their members in maintaining quality and consistency for breweries of all sizes. Student research assistants used their skills to develop and test tools with craft breweries to improve product quality. They worked with industry experts to learn about craft beer production, tests, and quality standards. The students also helped create quality guidelines, procedures, and quality control processes for the brewery's Quality Management System (QMS). They had productive meetings with brewery partners to address implementation and technical issues.

#### STUDENTS OF APPLIED RESEARCH:



"Working on this project has been immensely valuable to me. First, the project and the work involved provide a rare opportunity uniquely suited to my interests and studies. Second, I am excited and proud to have even a small part in this work, knowing that its end goal is so significant. I have been able to hone my lab, research and technical writing skills while receiving constant feedback from highly skilled professionals in the field."

- Mya Gerelus, Horticulture - Food and Farming program.





#### AUTOMATED VEHICLE APPLIED RESEARCH

Durham College AVAR (Automated Vehicle Applied Research) is a strategic applied research initiative focused on supporting innovative companies within the smart mobility sector, including electric vehicles and battery charging. The 2023-24 year is the second in the three-year Ontario Vehicle Innovation Network (OVIN) program.

The Durham Regional Technology Development Site (DRTDS) is a partnership between Durham College, the Regional Municipality of Durham, Spark Centre and Ontario Tech University. The DRTDS supports projects that assist with:

#### PUBLIC TRANSIT ELECTRIFICATION

SAFE & ACCESSIBLE TRANSPORTATION

#### **SMART & CONNECTED INFRASTRUCTURE**



DRTDS promotes community challenges in the three areas listed above, to design innovative technology solutions. Each challenge is shared within the technology development sector and companies submit their solution ideas. A selection committee reviews and ranks each proposal based on existing criteria that includes: technical readiness level, feasibility, and ability of the organization to execute their proposed solution. Finalists are asked to present their solutions and answer questions from a panel after which a winner is selected. Winning companies receive support to apply for OVIN project funding and become eligible to receive assistance from DRTDS partners in carrying out a demonstration project for their solution. Challenges issued to date:

- Safe and Accessible Transportation Challenge called for technology solutions to make intersections in the Durham Region safer by increasing driver awareness of pedestrians and cyclists. Parsons Corporation, in partnership with AutoGuardian by SmartCone, was awarded the challenge.
- Enabling Intelligent Transit Stops Challenge called for a detection and communication system for transit stops that enables Durham Region Transit to understand passenger behaviour at transit stops and improve overall customer experience.
- Mobile Air Quality Monitoring for Emergency Vehicles Challenge called for a mobile air quality monitoring system that enables Region of Durham Paramedic Services to monitor air quality at high levels of spatial resolution across Durham Region. This will enable better understanding of hot spots for air pollution.
- Dynamic Curve Warning Challenge was to enhance the safety of rural skewed intersections (county curves) for road users by offering an innovative solution to increase awareness of risks associated with high-speed county curves and intersection conflict points.
- The DRTDS co-hosted the 6th Annual Future of Transportation and Mobility forum with the Centre for Integrated Transportation and Mobility (Hamilton RTDS) which was attended by almost 200 registrants from 25 countries.



## **AI/HUB**

# THE AI HUB DESIGNATED A TECHNOLOGY ACCESS CENTRE BY THE NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL OF CANADA

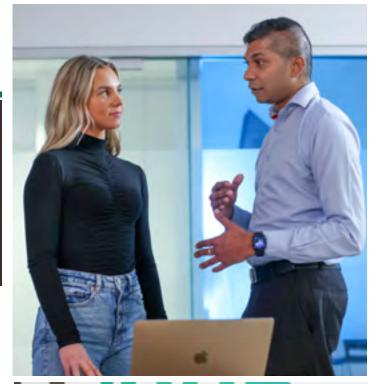
In July 2023, the Al Hub joined a network of 60 college applied research centres from across Canada who operate as Technology Access Centres. The TAC grant provides \$2.05M over five years to enable Artificial Intelligence (Al) adoption through industry applied research partnerships.

TAC empowers the AI Hub to fully realize its mandate of helping companies harness AI's potential across various sectors and use cases. The AI Hub offers expert advice, custom AI solutions, training, computational resources, and access to talented students, enabling companies to integrate AI into their daily operations.

### AI IN ACTION EVENT FOCUSED ON "EMBRACING IMPACT AND ENABLING INNOVATION"

On March 25, 2024, the Al Hub hosted the "Al in Action" event, sponsored by Invest Durham. This one-day conference brought together current, past, and future Al Hub industry partners, researchers, students, and local innovation ecosystem players.

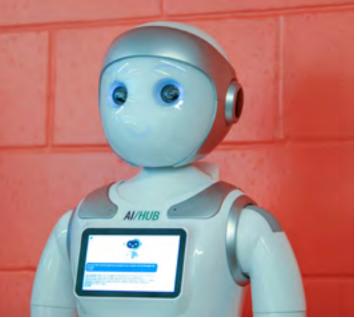
The event highlighted the shift toward widespread Al adoption and explored both its benefits and risks. Participants enjoyed a keynote address by Mohit Rajhans, a panel discussion on overcoming barriers to Al adoption, and breakout sessions on topics such as virtual reality, workforce preparation for Al disruptions, and intellectual property strategies for Al innovations. The conference aimed to inspire attendees, providing them with the contacts and tools needed to enhance Al accessibility for their businesses and personal lives.











#### INAUGURAL AI IMPACT AWARDS

The Al Hub was proud to host its first ever Al Impact Awards at Al in Action. The awards were an opportunity to celebrate and recognize the transformative power of AI solutions developed by DC researchers working with industry partners. Cash prizes were given to the top company, student and alumni and were sponsored by Angel Investors of Durham, and the Durham College Alumni Association.

#### WINNERS:

Industry Category – Minute Box Inc.

Alumni Category - Sharath Kumar Prabhu. '23

Student Category - Adytia Bommireddipalli. '24



#### AI IMPACT AWARDS RECIPIENT MINUTEBOX INC.

MinuteBox is revolutionizing corporate law and entity management through their pioneering platform. They offer seamless access to corporate records and documents, eliminating the laborious and error-prone traditional methods. Serving esteemed clients globally, including major law firms and corporations, MinuteBox has introduced Second Chair, an Al module that leverages cutting-edge technology for advanced data analysis and document generation. This Al-driven innovation not only enhances efficiency but also sets a new standard in corporate governance. MinuteBox is redefining the future of corporate law with unparalleled convenience, accuracy, and efficiency.

On winning DC AI Hub's first ever AI Impact Award, Daniel Levine, CEO of Minute Box said, "We are incredibly honoured to receive the Al Impact Award, marking a milestone in our journey of innovation. This accolade is a reflection of our team's relentless pursuit of excellence and our deep commitment to transforming the legal industry through AI technology."

## IP MOBILIZATION

In partnership with Intellectual Property of Ontario (IPON), the IP program at Durham College was implemented to maximize the value of our clients' innovative IP. Ohe goal is to help businesses develop robust IP strategies, provide funding for IP related services, and promote commercialization of their technology from a local to a global scale.

In its pilot year, DC's IP Program has been successful thanks to support from 25 team members in the Office of Research Services, Innovation and Entrepreneurship (ORSIE) who have been actively engaged in the project. In June 2023, Dr. Joshua Cohen was appointed Commercialization Specialist to lead the initiative, leveraging his expertise to establish an innovative college-based technology transfer program that has garnered achievements for both the college and our industry partners. The active involvement of ORSIE managers and principal investigators from our five research centres has been pivotal in identifying suitable clients and projects for the IPON project.

Collectively, an agile IP consultation and investment process was developed and tailored for Ontario-based small- and medium-sized enterprises (SMEs). Investing over \$100,000, the program benefited over 50 SMEs in its first year, resulted in eight patent applications, two trademark applications and several patent licensing and non-disclosure agreements. Client testimonials attest to the efficiency of these IP services compared to other programs. Overall, the program has helped our clients protect their IP assets, strategize to maximize their value, and reduce costs with our investments.

#### **SME CASE STUDIES**

EcoSafeSense, a start-up specializing in air quality sensors, initially aimed to expand its presence in the automotive industry by enhancing cabin air quality control. However, the company's broader goal was to integrate its sensors into sustainable city infrastructure to optimize air quality in various environments. Despite its technological expertise, EcoSafeSense needed to gain in-depth IP knowledge. The DC IP team collaborated with EcoSafeSense's leadership to develop a tailored IP strategy, prioritizing key aspects of its IP portfolio and devising strategies to enhance its market value.

Armed with insights from IP education and collaboration, the DC IP team conducted a thorough IP discovery research and competitive analysis. This revealed a market potential estimated at \$10 million, a promising sign for potential investors. Subsequently, an investment in EcoSafeSense was secured, paving the way for developing a patent application, which is a crucial step in protecting their technologies and ensuring long-term success in target markets.

## IFTECH INVENTING FUTURE TECHNOLOGIES

IFTech, a proactive technology company specializing in virtual and augmented reality solutions, developed a wearable device, As Real As It Gets (ARAIG), designed to offer realistic training experiences for emergency response teams without physical risk. Recognizing the potential of their innovation and the need to accelerate commercialization, IFTech took the initiative and approached DC for funding.

In response to the urgent need for IP protection and market expansion, the DC IP team conducted a comprehensive IP due diligence. This assessment revealed a significant threat from a patent troll, underscoring the necessity for immediate patent protection to mitigate the risk of exploitation or theft.

Within four weeks of the initial meeting, IFTech successfully submitted a patent application, securing its IP rights and strengthening its market position.

Following this success, IFTech expressed interest in patenting additional technologies. The team referred them to the broader IPON initiative to expand their IP portfolio and maximize innovation potential.

This case highlights DC's IP program's ability to swiftly address threats and support the protection and growth of groundbreaking technologies, demonstrating its efficient, flexible, and responsive approach.

# RESPONSIBLE CONDUCT OF RESEARCH REPORT

In accordance with the Tri-Agency Framework: Responsible Conduct of Research (2016) Article 4.5 (b), DC is required to annually report to the secretariat any breaches involving funds from the Tri-Agencies (SSHRC, CIHR and NSERC). The college has a Responsible Conduct of Research policy which governs research activities at the college. In line with the Tri-Agency Framework and college policy, DC must report any breach of conduct where there was a failure to comply with any research related policy at any time throughout the life cycle of a research project. There were no allegations or breaches of conduct of research in 2023-2024.

## RESEARCH ETHICS BOARD

The DC Research Ethics Board (REB) had an eventful year supporting researchers, reviewing a range of innovative research studies, and engaging in significant learning opportunities. REB members and staff continue to concentrate efforts toward ongoing learning and expanding the board's capacity to ethically review diverse research by engaging in valuable trainings and the annual Canadian Association of Research Ethics Board (CAREB) conference.

#### RESEARCH ETHICS BOARD MEMBERS:

Kay Corbier (chair) – Faculty of Social & Community Services

Laura Benninger – Faculty of Science, Engineering & Information Technology

Dr. Arlene de la Rocha – Faculty of Health Sciences

Dr. Crystal Garvey - Faculty of Health Sciences

Candi Thayer – Member knowledgeable in law

Dr. Lynne Kennette – Faculty of Liberal Studies

David Sumantry - Community Member



#### 2023-24 ACTIVITIES



- The DC REB continued to support the George Brown College (GBC) REB until June 30, 2023, acting as their Board of Record. Three of the applications reviewed by the DC REB's were for the GBC REB.
- A retreat was held June 1, 2023, where members discussed topics such as Equity, Diversity and Inclusion (EDI), as well as research data management.
- Members provided a variety of presentations related to research ethics for college staff.
- In January 2024, the REB launched a new internal professional development module for faculty using course-based research.
- In February 2024, many members attended a workshop on The Fundamentals of the First Nations Principles of Research Data Ownership, Control, Access and Possession (OCAP®).
- The REB developed "The First Nations Principles of OCAP®: Considerations for Research Ethics Board Applications," as a document to be used in review of applications involving First Nations research, alongside the Tri-Council Policy Statement-2 (TCPS2).









## **KNOWLEDGE MOBILIZATION**

Note: Bold text denotes DC affiliation; \*denotes DC student

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#### PRESENTATIONS:

Armstrong, T. & Virtue, L. (2024). Strengthening Foundational Literacy Skills with Evidence-Based Routines. Reading For The Love of It. 46th Annual Language Arts Conference. Toronto, Ontario.

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Closs, L. (2024, February 7). Engaging Youth in Applied Research: Hope for the Future. Canada E-learning series; Youth in Community Based Research held by Community-Based Research Canada.

Closs, L. and Rodrigues, Anna. (2024, March 27). Creating Impact through Community-Based Research Collaborations: Principles and Experiences. Women in Research Council: Building EDI Knowledge in Research Speaker Series.

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#### **COMMITTEE MEMBERSHIPS**

**Button, D.** (2023-2024). Chair, Ministry of Health and Long-Term Care Advanced Emergency Medical Care and Advanced Care Paramedic Theory Exam Committee; Advisor, STEPS Advisory Committee, OnTechU.

Crowley, Sean. (2023-2024). Ontario College Mathematics Council Member.

Dancey, Erin. (2023-2024). Canadian Journal for the Scholarship of Teaching and Learning [Reviewer].

Doyle, Nicole. My committee memberships are the same as last year: Best Start Network of Durham Region, Research and Knowledge Mobilization Sub-Committee of the BSN.

Kennette, Lynne. Psychology Advisory Board (Pearson Canada); CODiE Award Judge

Lamarche, Nadine. Hockey Helps the Homeless, Durham Region Pro-Am, Organizing Committee Member, Volunteer Coordinator.

McCormick-Brighton, Corrine. Region of Durham Best Start Network (BSN) Research and Knowledge Mobilization Sub-Committee Member

Sagar, S.K. Acted as Advisory Board Member for International Conference on Recent Trends in Artificial Intelligence and Data Science (ICRTAIDS - 2024) at DY Patil School of Engineering, Pune University, Maharashtra, India

**Strawn, T.** (2023-2024). President of the Council of The College of Dental Hygienists of Ontario; Vice President of the Board of Directors of the Ontario Volunteer Emergency Response Team.

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