

Conducting innovative research across diverse fields

Memorial University and IBM partner to build CAIR,
one of Canada's fastest computing environments.



The Centre for Analytics, Informatics, and Research, or CAIR, housed at Memorial University in Newfoundland and Labrador, is a high-performance computing centre with the capacity to rapidly process and analyze vast amounts of data, all while providing secure storage with offsite backups. Through CAIR, researchers in Newfoundland and Labrador have access to one of Canada's fastest computing environments to conduct innovative, research-oriented projects across diverse fields, such as data science and astrophysics, artificial intelligence, machine learning, image analysis, scientific computing and genetic analysis.

Investing in its computing infrastructure, CAIR underwent a significant refresh in January 2022. Now hosted on [IBM Power System AC922s](#) with [Red Hat Enterprise Linux](#), CAIR provides world-class scientific training opportunities for faculty and students at Memorial University. Aside from driving research and innovation, Memorial University's partnership with IBM has helped establish a technological footprint supporting long-term economic growth and enabling qualified professionals to participate in technology-related fields within the region.

What makes Newfoundland and Labrador unique?

Newfoundland and Labrador's condensed population and geographical location make it the ideal place to conduct genetic studies. Commonly referred to as a founder population, an estimated 90 percent of Newfoundland and Labrador's residents descend from the 20,000 to 30,000 original migrants from England and Ireland in the 1700s. Existing as a founder population has significantly reduced the genomic variability among the people, making certain diseases easier to identify. Juvenile type 1 diabetes, sudden cardiac disease, psoriasis and inflammatory arthritis are all over-represented in Newfoundland and Labrador. Researchers have concluded these findings upon conducting numerous research projects analyzing family history, pedigrees and phenotype information. Looking into the future, Memorial University hopes to utilize the capabilities of CAIR to analyze next-generation sequences, allowing researchers to identify the genetic factors leading to disease. Additionally, the planned ongoing storage of data within CAIR will enable researchers to reanalyze sequences as genetic and genomic research evolves and thus identify hereditary predispositions without needing to take new samples and facilitate improvements to care.

Technology continues to spur innovation

Dating back to 2014, the partnership between IBM and Memorial University in Newfoundland and Labrador has led to significant advancements in health and healthcare studies. IBM has worked to ensure that researchers in the province continue to succeed in conducting hundreds of extensive health-related research projects. Aligning with the overarching objective to encourage health system reform, the projects conducted have worked to lessen ineffective testing, reduce prolonged patient wait times, change the medical practices for prescribing medication and so much more.

Working in partnership with the Newfoundland and Labrador Centre for Health Information (NLCHI), CAIR has received and stored detailed administrative health data, which through analysis and clinical interpretation, has facilitated recommendations for the most extensive reform of the health and social care system ever conducted within the province. NL SUPPORT and Quality of Care NL are two local research and evaluation groups conducting research projects in Newfoundland and Labrador, striving to increase the quality of healthcare within the province.

As we begin 2023, the benefits of CAIR transcend even further. Not only do the students and faculty within a range of faculties and departments at Memorial University find great benefits in having access to robust data sets that can be analysed and stored on CAIR, but other research and evaluation groups from a range of different disciplines within the province contribute and benefit from the high-performance computing centre.

Additional support

Throughout the global pandemic, the benefits of CAIR were further exemplified. Thanks to his medical expertise and technical knowledge, IBM employee Dr. Randy Giffen was active in utilizing CAIR for the work around the management of COVID-19 in the province. Going further, Dr. Giffen was also involved in the group advising the Honourable Dr. Andrew Furey, premier of Newfoundland and Labrador, the Honourable Dr. John Haggie, then minister of Health and Community Services, and Dr. Janice Fitzgerald, Newfoundland and Labrador's chief medical officer of health, on how the province should move forward with managing COVID and the roll-out of vaccines.

Extending support even further, IBM has made a point to offer additional resources to residents with access to [IBM SkillsBuild](#) and [The Startup with IBM program](#). Both IBM programs are designed to aid in developing highly-qualified professionals and encouraging economic growth, making IBM proud to extend these resources to Newfoundland and Labrador.

Benefits of partnership

Rather than perpetuating a standard supplier relationship between a long-established IT solution provider and an accredited university, both IBM and Memorial University have engaged in a true partnership. Initially, there were few goals in mind, but as the partnership evolved over time, both institutions embraced challenges that were never on the horizon to make a meaningful impact. From the educational benefits felt by the researchers and students at Memorial University to the entire Newfoundland and Labrador population gaining from an enhanced health system, IBM is proud to maintain such a solid partnership to reimagine health care as we know it.

IBM Power System AC922

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As Newfoundland and Labrador's only university, Memorial has a special obligation to the people of this province. Established as a memorial to the Newfoundlanders who lost their lives on active service during the First World War and subsequent conflicts, Memorial University draws inspiration from these sacrifices of the past as we help to build a better future for our province, our country and our world. <https://www.mun.ca>

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