

What Makes This Research Cluster a Leader

Our researchers have a unique combination of expertise. The University of Regina is one of the world's leading centers for rough sets research, granular computing, and web intelligence. In data mining, our researchers have a global reputation for interestingness measures (the ability of software to show the most interesting results, as opposed to all results). With respect to computational learning theory, this cluster has the only Canada Research Chair nationally. In visual analytics, researchers are national leaders on sentiment analysis. Within the cultural field we have a Canada Research Chair in Interactive Media and Performance. In the province, the cluster has the only strong concentration of researchers on Big Data and is the only place to offer training and research in the Creative Technologies, which bridge education across computer science, art and engineering. Nationally, it has a unique strength on soft computing fields (e.g. rough sets, granular computing, web intelligence) with one of the highest citation rates in the world. Researchers attract up to 10 visiting international collaborators each year to perform joint research. Our researchers tend to lead the province in terms of citation impacts in the field and have obtained numerous prestigious national and international awards and recognitions.

Research Impact

Based on citation counts and number of publications, as well as having key members of world leadership teams, across the fields of enquiry, the University can categorically state our researchers are leaders. They are well-supported by external funds, have trained an impressive number of highly qualified personnel, including graduate students and post-docs, and have hosted many international scientists. Results of data analytics are being applied to local businesses with international reach, health (especially e-health), policing, and government data sets for policy initiatives. Our researchers in design, digital humanities and across the arts are engaged in critical qualitative research which supports the analysis of the digital culture.

Critical Mass of Highly Qualified Personnel (HQP)

The cluster has a critical mass of HQP in terms of senior and mid career faculty members, a large contingent of graduate students, and a regular contingent of postdoctoral and visiting researchers. Senior researchers specialize in machine learning, data mining, visualization, rough sets, granular computing and web intelligence, interactive media and performance. They have well established research programs with long histories of external funding. Mid career researchers specialize in information security and digital privacy issues, decision making, computational chemistry, entrepreneurship, interface design, data mining, e-commerce, public policy, subatomic physics and granular computing. Early career researchers specialize in creative technology, sentiment analysis, visualization, and computational learning theory.

Interdisciplinary Research

The basis of this research is interdisciplinary. Opportunities include Computer Science (machine learning, data analysis, wise computing), Business Administration (entrepreneurship, information security and digital privacy, e-commerce), Media, Art, and Performance, Arts, English and Education (creative technologies and the digital humanities), Chemistry (computational chemistry), Mathematics and Statistics (statistics), Physics (subatomic physics data analysis), Psychology (human-computer interface theories and experiments), and Software Systems Engineering (sentiment analysis).

The Office of the Vice-President (Research)

University
of Regina

David Malloy, PhD, Vice-President (Research)
Administration-Humanities Building 526, University of Regina
3737 Wascana Parkway, Regina, SK S4S 0A2
Phone: 306-585-5184 • Fax: 306-585-5255
E-mail: VP.Research@uregina.ca • www.uregina.ca/research/

University
of Regina



UNIVERSITY OF REGINA RESEARCH CLUSTERS 2016-2021 Alignment with the Saskatchewan Plan for Growth

Research encompasses creative endeavours and other scholarly activities that foster new knowledge. Critical to the University's success are its research clusters, which have been identified as a function of their critical mass (highly-qualified personnel), performance (impact) and distinctiveness:

| Anxiety, Stress & Pain | Water, Environment & Clean Energy |
| Digital Future | Social Justice & Community Safety |
| Integrated Human Health: Equity, Disease & Prevention |

Digital Future Research Cluster

Our researchers are leading the way to the Digital Future through innovation and creativity with research in analytics, wise computing; visualization; data security & policy; design, creation and analysis of emerging technologies; and within the digital humanities. They are emphasizing effective, efficient and sensitive decision-making by working with new information accumulated from diverse sources of data. In application scenarios, data may be scarce or expensive, requiring machine learning methods that are efficient in their use of data. By contrast, data may also occur in enormous quantities accumulated from diverse sources and in heterogeneous formats. The growth and continuous expansion of the data culture provides constant opportunities for our researchers to innovate, partner, develop and produce across fields such as commerce, the arts, science, engineering, education, healthcare, public administration, media, and culture industries.

Our research follows natural research cycles and works to build new methods for accessing information. We work in data acquisition, through analytics and visualization, to decision-making and applications involving creativity and education, while maintaining security and protecting privacy. In data acquisition, the challenge is to design user interfaces to obtain data from real-time sources such as mobile apps, social media, particle accelerators and chemical simulations. In analytics, the challenge is to design appropriate machine learning or data mining algorithms to operate on diverse data. In visualization, the challenge is to present the results of data analysis in an effective visual format. In decision-making, the challenge is to transform ideas and techniques related to rough sets, granular computing, and web intelligence to enable wise decision-making. In this natural research cycle, particular application domains may pose additional challenges. In education and the digital humanities, our researchers are challenged with understanding accessibility and the creation of new tools for learning. In media and art, the challenge is to unpack the nuances and critical dialogue of the shifting culture in order to humanize the situation and experience of the new information age. The faculty strategically work to address these challenges, and a wealth of others, through interdisciplinary research and exchange, in order to produce work for the global community.

UNIVERSITY OF REGINA'S DIGITAL FUTURE RESEARCH CLUSTER ALIGNMENT WITH THE SASKATCHEWAN PLAN FOR GROWTH

The Saskatchewan Plan for Growth sets out the Government's vision for a province of 1.2 million people by 2020. The Digital Future Research Cluster aligns with the 6 Core Growth Activities identified by Government to foster economic growth and address challenges.

Growth Activity	How the Digital Future Research Cluster Aligns with Growth Activity
Growing and Developing Saskatchewan's Labour Force	<p>Practical training at a high level in wise computing and big data</p> <ul style="list-style-type: none"> graduate Co-op Program integrates Masters students in local industry before graduation twelve graduate students have internships at Institute for Supply Management over two years

Growth Activity	How the Digital Future Research Cluster Aligns with Growth Activity
Connecting Saskatchewan to the World	<p>Cluster has multiple connections with researchers in other countries</p> <ul style="list-style-type: none"> regular exchange of researchers with China and Europe attracts up to ten visiting scientists per year to the University to work with faculty members the cluster attracts the majority of its graduate students from countries including Brazil, China, India, Nigeria and Pakistan

Growth Activity	How the Digital Future Research Cluster Aligns with Growth Activity
Investing in the Infrastructure Required for Growth	<p>Support modernization of infrastructure</p> <ul style="list-style-type: none"> aid crown corporations in making cost-effective decisions about infrastructure upgrades

Growth Activity	How the Digital Future Research Cluster Aligns with Growth Activity
Ensuring Ongoing Competitiveness of Saskatchewan's Economy	<p>Apply research to add value to Saskatchewan industry</p> <ul style="list-style-type: none"> secured funding to predict product pricing for Saskatchewan company innovative classes and hack-a-thons encourage students to master mobile computing

Growth Activity	How the Digital Future Research Cluster Aligns with Growth Activity
Advancing Saskatchewan's Natural Resource & Agricultural Advantage	<p>Research, innovation and commercialization</p> <ul style="list-style-type: none"> simulation of mining and construction equipment for training innovative analysis of growing plants using Canada Light Source

Growth Activity	How the Digital Future Research Cluster Aligns with Growth Activity
Ensuring Fiscal Responsibility Through Balanced Budgets, Lower Debt, Smaller More Effective Government	<p>Efficient evaluation of big data about our communities</p> <ul style="list-style-type: none"> evidence Based Decision Support with University's Collaborative Centre for Justice & Public Safety to create, adapt and evaluate data science and visualization techniques for analyzing large amounts of government data