ANNUAL RESEARCH EXPO

FACULTY OF COMPUTER SCIENCE

2025

UNB

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UNB | Computer Science

WELCOME FROM THE DEAN

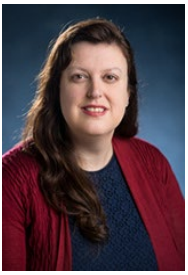
The 2025 Faculty of Computer Science Annual Research Expo showcases leading-edge research and new and evolving developments related to the area of information and communication technology. This year, we have a wide range of interesting researcher and industry speakers and 31 posters in the poster sessions. You will see that the research contributions of our faculty researchers and students are very broad while remaining inherently discipline-related, which is one of the unique features that distinguishes our Research Expo from other events that focus on more specific areas of computing.

I hope you enjoy the Expo's program and find the experience of meeting and sharing thoughts and ideas with our students, researchers, and each other, to yield an interesting and inspiring day.

I wish to thank the many faculty and staff who contributed to the success of this event. I am also profoundly grateful to the students and professors whose work is on display, and to all participants for devoting time to being here with us. It is your participation that makes it all worthwhile.

Luigi Benedicenti, *Dean and Professor, Faculty of Computer Science*

WELCOME FROM THE ASSOCIATE DEAN, RESEARCH & GRADUATE STUDIES



Welcome to the Faculty of Computer Science 2025 Research Expo! The Expo is our annual showcase of research in computing, bringing together academic research with current innovations from industry. It's our opportunity to see what people are doing, to see what's been accomplished, and to engage with a wide range of innovative ideas in computer science. This year, we'll hear from some of our newest faculty members about their research, and from several companies about their innovations. During breaks, students will be presenting their work on posters in the foyer. Graduate students will also be presenting briefly in our inaugural Three-Minute Thesis competition.

Of course, our program and our posters do not encompass everything being done in industry or in our faculty. We are growing and building: new people, new ventures, and new advances from our ongoing research. This year, we will hear from the research director of our newest institute, the Research Institute in Data Science and Artificial Intelligence, about the institute's vision. There's a lot going on, and this momentum will continue, making these expos interesting and engaging year after year.

Much thanks to our participants: our speakers from faculty and industry; students speaking and presenting posters; our staff for their support and organization; and all attendees for coming and making our Expo a celebration of ideas and achievements in technology. A special thanks to Francis Palma, Sonya Hull, Kelley Nelson, Shelley Zimmerman, and John Peterson for their work in the organization and support of this Research Expo.

Patricia Evans, *Associate Dean (Research and Graduate Studies) and Professor, Faculty of Computer Science*

AGENDA

8:30 – 9:00am	**Registration**
9:00 – 9:10am	**Welcome and Opening Remarks:** **Patricia Evans**, Associate Dean, Faculty of Computer Science **Dave MaGee,** Vice President Research, UNB
9:10 – 9:35am	**Sajjad Dadkhah,** Faculty of Computer Science *Smart Profiling, Stronger Protection: The Role of Datasets in Securing IoT/IIoT Critical Ecosystems*
9:35 – 10:00am	**David Small,** Director of Advanced Research & Innovation, IGT **Fayez Idris –** Senior Data Scientist, IGT *Building AI Research Capacity and a Gaming Talent Pipeline* https://www.igt.com/
10:00 – 10:15am	**Hung Nguyen,** PhD Student, Faculty of Computer Science *Beyond Explainable AI (XAI) at Analytics Everywhere Lab (AELab)*
10:15 – 11:00am	**BREAK / POSTER SESSION I**
11:00 – 11:20am	**Scott Bateman,** Research Institute in Data Science & Artificial Intelligence (RIDSAI) *Towards an Anti-Futurist Manifesto: Building a People-First Vision for AI and Data Science*
11:20 – 11:45am	**Lori Weir,** CEO and Founder, Four Eyes Financial https://foureyes.financial/about-four-eyes/

11:45 – 12:00pm	**Atah Nuh Mih,** Research Assistant, Faculty of Computer Science *Towards a Neural Network Evaluation Mechanism for Neural Architecture Search*
12:00 – 1:00pm	**LUNCH / POSTER SESSION II**
1:00 – 1:45pm	**Student 3-Minute Thesis** – hosted by Francis Palma
1:45 – 2:10pm	**Mike Leblanc,** Founder and CEO, BlueKit *BlueKit: Inclusive Tech Education* https://www.bluekit.tech/en
2:10 – 2:40pm	**BREAK**
2:40 – 3:00pm	**Muhammad Zubair,** MCS Student, Faculty of Computer Science *Exploring Landscape of DeepFake*
3:00 – 3:25pm	**Georgiy Krylov,** Faculty of Computer Science *Possibilities for AI in high-performance computing and compilers*
3:25 – 3:30PM	**Student Prizes and Wrap Up**
3:30 – 5:00pm	**Barrett Chair Pitch & Demo Event with Ken Kent and entrepreneurship students** Please join us for this new event that will showcase student product demos and new venture pitches, hosted by Dr. Ken Kent, Barrett Chair in Entrepreneurship for Digital Transformation.

OUR RESEARCH CHAIRS, INSTITUTES, AND CENTRES

The Faculty of Computer Science is proud of our distinguished Research Chairs, Institutes, and Centres, all focusing on leading-edge areas of computer science, technology, innovation, and entrepreneurship.

RESEARCH CHAIRS

- **Dr. Ali Ghorbani** - Tier 1 Canada Research Chair in Cybersecurity
- **Dr. Ken Kent** – Barrett Chair in Entrepreneurship for Digital Transformation
- **Dr. Sajjad Dadkhah** – Mastercard Cybersecurity Research Chair in IoT security
- **Dr. Kalikinkar Mandal** - NB Power Cybersecurity Research Chair - Smart Grid Security and Privacy

INSTITUTES AND CENTRES

Canadian Institute of Cybersecurity (CIC)

Founded in 2017, the CIC is Canada's premier cybersecurity innovation and talent development hub. As a multidisciplinary institute dedicated to training, research and development, and entrepreneurship, CIC is the first institute of its kind to bring together researchers and practitioners from public and private sectors, as well as academia, to promote the creation of innovative cybersecurity technologies. CIC is a founding member of the National Cybersecurity Consortium (NCC), which was established in 2020, and co-founder of the UNB-NRC Consortium in Cybersecurity in 2019.

Research Institute in Data Science and Artificial Intelligence (RIDSAI)

RIDSAI, established in 2023, is a focal point for fundamental and applied research in all areas of data science and AI, from developing new algorithms to leveraging their strengths for social good to ensuring their ethical and respectful use. By bringing together researchers across many domains, the RIDSAI enables multidisciplinary, comprehensive, outcome-focused insights and solutions for community and industry partners in the Atlantic region and beyond.

SPECTRAL Spatial Computing Research Centre

SPECTRAL is the leading touch point for spatial computing technology in Atlantic Canada, providing access to cutting-edge applied research and pioneering technological leadership and fostering robust partnerships with industry, academia, and government. SPECTRAL seeks to catalyze innovation in Extended Reality technologies (Virtual, Mixed, Augmented, and other 3D and spatial technologies) and empower effective implementation and maximization of these technologies, which has already transformed how people can and will work with technology.

IBM Centre for Advanced Studies - Atlantic (CAS-A)

Co-Founded in partnership with IBM, CAS-Atlantic is a research-based centre dedicated to promoting and cultivating collaborative research between UNB and industry. The Centre conducts research aimed at advancing the performance of software systems and applying research findings to commercial products. Computer science researchers and students explore innovations in the context of real-world applications through our industry partnerships.

FACULTY OF COMPUTER SCIENCE SPEAKERS

Thank you to our presenting faculty member researchers, partners, and students.

Atah Nuh Mih is an Edge AI researcher with a background in machine learning for edge devices. Originally from Cameroon, he earned his Bachelor of Technology in Computer Science and Engineering from Christ University, Bangalore, India. In October 2024, he completed his Master of Computer Science at the University of New Brunswick (UNB), where he specialized in transfer learning on edge-cloud computing environments. Atah currently works at the Analytics Everywhere Lab at UNB, where he researches computer vision and Edge AI applications. He has published multiple research papers contributing to advancing AI deployment in real-world, resource-constrained environments. Atah is passionate about bridging the gap between AI theory and practical applications.

Georgiy Krylov was born in Almaty, Kazakhstan. He received his doctorate degree in 2024 at UNB, and his master's and bachelor's degree from Nazarbayev University in 2018 and 2016. His research interests include Compilers and runtime environments design; Application of high-performance computing and AI to solving real-world problems; FPGA CAD; Quantum and reversible computing.

Hung Nguyen is a PhD candidate in the Analytics Everywhere Lab (AELab) at the University of New Brunswick.

Muhammad Zubair is currently an MCS student with the Faculty of Computer Science, Canadian Institute for Cybersecurity (CIC), University of New Brunswick (UNB). He has completed a bachelor's in computer science from the National University of Computer and Emerging Science, Lahore Pakistan. His current research interests include cybersecurity and applications of artificial intelligence and emerging technologies.

Sajjad Dadkhah is the Canada Mastercard IoT Research Chair, R&D Team Lead at the Canadian Institute for Cybersecurity (CIC), and Assistant Professor at UNB, brings over a decade of expertise in advanced cybersecurity solutions. His work spans AI-driven detection systems, deep learning, and NLP methods for hostile activity identification, as well as intrusion detection systems (IDS) tailored for IoT, IIoT, and critical infrastructure and Healthcare environments. His

expertise as a team leader has been pivotal in various prestigious organizations, including Kyushu University (Japan), University Malaya (UM), IRIS Smart Technology Complex, and Kyushu Institute of Technology (Japan). He is the founder of several cybersecurity datasets in the IoT and NLP security domains. He also specializes in digital image watermarking for tamper detection and forensic analysis. His current interests include Human-centric Cybersecurity, AI-driven threat modeling, Security architectures with large language models, and Gen-AI algorithms.

Scott Bateman is the Research Director of the Research Institute for Data Science and Artificial Intelligence (RIDSAI), the Director of the Spatial Computing Research Centre (SPECTRAL), and the co-director of the Human-Computer Interaction Lab. His work focuses on adopting emerging technology to solve real world problems in areas such as health care, skills training, and entertainment. He places a large focus on understanding how university researchers can best support the needs of regional, national and international industrial partners.

Scott has served in senior editorial roles at leading HCI publication venues, including the ACM CHI and CHI PLAY conferences. His work has previously received a Best Paper and two Honourable Mention awards at the CHI conference.

INDUSTRY SPEAKERS

Thank you to our valued industry partners for coming to share their time, knowledge, and experiences with us.

Dave Small – Director of Advanced Research and Innovation, IGT

Dave Small is a registered professional engineer in the province of New Brunswick and an Electrical Engineering graduate of UNB. He has been working for IGT Canada (formerly SPIELO International Canada) since 1999, in several capacities such as Engineering Manager, Sr. Project Manager, Sales Executive, and in his current position as Director of Advanced Research and Innovation. His responsibilities include AI research, product innovation and research collaborating with academia and 3rd parties. Prior to joining IGT, Dave has held various technical positions with Westinghouse Canada in Ontario, the Research and Productivity Council, and Com Dev Atlantic.

Fayez Idris – Senior Data Scientist, IGT

A Senior Data Scientist at IGT Canada, he joined IGT in 2011 and has contributed to innovative projects that laid the foundation for current data analytics and AI research. Before joining IGT, Fayez worked in embedded systems, software development, and image processing.

Lori Weir – CEO & Co-founder, Four Eyes Financial

Lori is a people, business & community builder. In her 30 years of entrepreneurship, she co-founded and was the managing partner of two successful consulting firms, helping some of Canada's most profitable companies align processes and employee behaviours to drive positive results. Lori's background in strategy development and execution governance led Four Eyes Financial, a company she co-founded in 2015, to earn both the 2023 RegTech Company of the Year & Best Wealth Management Regulatory Solution (Canadian Regulatory Technology Assoc).

Lori is the past chair of ALS Canada and Marathon by the Sea and is proud to support the Women's Equity Lab – funding women led start-ups in Atlantic Canada.

Mike LeBlanc – Founder and CEO of BlueKit Software

Mike is a proud UNB Computer Science graduate who has spent the past 30 years building technology companies and empowering others through innovation. After earning both his bachelor's and master's degrees from UNB, Mike went on to launch several ventures—including IcGlobal, Ensemble, and Blue Spurs (acquired by Deloitte Canada in 2019 to expand cloud innovation and raise New Brunswick's tech profile). Mike became a Partner at Deloitte and led national cloud initiatives.

Today, he is the Founder and CEO of BlueKit Software, an edtech company on a mission to help kids learn technology through hands-on, inclusive, AI-led creative experiences. His goal is to inspire a new generation of builders and problem solvers by transforming how tech is taught in schools.

Throughout his career, Mike has remained closely connected to UNB, having hired and mentored nearly 100 co-op students and graduates, helping to grow local talent and support emerging innovators.

RESEARCH POSTERS

A big thank you to our thirty-one poster participants!

Alireza Azadi, Kenneth B. Kent - *A Graph-Based ECO Flow for High-Level Synthesis*

Amir Arjomand, Kenneth B. Kent, Georgiy Krylov, Amin Boudesh, Farnoush Bayat, Arash Mohammadi - *TransfoRhythm: Accurate Blood Pressure Estimation Via Transformer Architecture and Solo PPG Signal Capturing*

Amirhossein Azimyzadeh, Scott Bateman - *Investigating the Impact of Spatial Map Representations on Remote Asymmetric Mixed Reality Collaboration*

Aniqa Riasat, Scott Buffett, Michael Fleming - *Analyzing Relationships between Skeletal Joints*

Arbaaz Dharmavaram, Farrukh Bin Rashid, Saqib Hakak - *FactCellar - An AI-Driven Approach to Automated Fact-Checking*

Asfia Kawnine, Hung Cao - *Multi-Tier Aggregation and Multi-Global Server Architectures for Spatial Data Analysis in Federated Learning*

Atah Nuh Mih, Francis Palma, Hung Cao - *Towards a Neural Network Evaluation Mechanism for Neural Architecture Search*

Bhavani Sai Prasad Addala, Mohammad Mehabadi, Kenneth B. Kent - *DGSim: A Scalable and Configurable Framework for Simulating Energy Consumption of Household Appliances*

Cole Campbell, Don Leidl, Scott Bateman - *Mixed Reality Medical Task Trainer*

David Mohren, Kenneth B Kent, Brett Kelly - *How to Establish Ciphertext Integrity in Software-Defined-Storage Systems*

Fahimeh Tolouee, Scott Bateman - *Bridging Mindfulness and Mixed Reality: An Immersive Solution for Everyday Practice*

Geetesh More, Long Tran Hong Nguyen - *SMARTXL*

Hanieh Ghabelialla, David Bremner, Rasoul Shahsavarifar - *Enhancing Anti-Money Laundering Detection with Group aware Deep learning*

Hassan S. A. Arafat, David Bremner, Kenneth B. Kent, Julian Wang - *Object-Oriented Access Predictor*

Hesamodin Mohammadin, Griffin Higgins, Samuel Ansong, Hossein Shokouhinejad, Mahdi Rabbani, Roozbeh Razavi-Far - *Graph Neural Network Based Malware Detection System & Statically Generated Graphs for Malware Analysis*

Hossein Shokouhinejad, Griffin Higgins, Roozbeh Razavi-Far - *Graph Reduction via Node-Centric Pruning: A Step Toward Efficient GNNs*

Hung Nguyen, Alireza Rahimi, Veronica Whitford, Hélène Fournier, Irina Kondratova, René Richard, Hung Cao - *Learning the Rhythms of Mental Health: From Heart Rate Variability to Psychiatric Disorder Detection with Contestable Language Models*

Ishan Randeniya, Saqib Hakak, Hung Cao - *Cooperative Adaptive Cruise Control Simulation Test Bed*

Krishno Dey, Hung Cao, Francis Palma - *Impact of Linguistic Patterns and Antipatterns on the Understandability and Readability of APIs*

Mahjabin Muntaha, Wei Song - *Deep Reinforcement Learning with Heterogeneous Graph for Collaborative Task Allocation*

Marian Kushigbor, Scott Buffett, Michael Fleming - *Conditional Preference Networks as a Framework for ADL Recognition*

Maxwell Jianzhou Wang, Hung Nguyen, Rene Richard, Hung Cao - *Graffiti Detection Efficient Design with Comprehensive Evaluation*

Minh Truong, Kenneth B. Kent, Brett Kelly - *From Legacy to Cloud-Ready: Rebuilding a Scalable Key Management System*

Mo Mehabadi, Kenneth B. Kent - *Transformers for Predictive and Generative AI in Smart Energy Communities*

Seyed Alireza Rahimi Azghadi, Hung Nguyen, Francis Palma, Hung Cao - *Improving Indoor Localization Accuracy with BLE Fingerprinting and SLAM*

Simin Shehbaz, Kenneth. B. Kent, Mohammad Mehabadi, Bhavani Sai Prasad Addala - *Benchmarking and Optimizing TSDBs for Appliance-Level Energy Consumption Data*

Taylor Short, Scott Bateman - *Augmenting Seniors' Social Connections with Tangible AR*

Tianna-Lee Salmon, Francis Palma - *Improving agile software issue prioritization through the lens of constraint solving*

Wei Song, Pavitra Modi - *Cooperative Intelligence with Deep Reinforcement Learning and Hypergraph Matching*

Zeynab Anbiaee, Sajjad Dadkhah, Ali A. Ghorbani - *FIGS: A Lightweight Intrusion Detection Framework For Highly Imbalanced IoT Environments*

THREE-MINUTE THESIS PRESENTATIONS

A big thank you to our thesis presenters!

David Guillermo Wilhelm Mohren *- AEAD-venture in Large Scale Storage Land*

Muhammad Zubair *- DeepFakes Detection*

Bhavani Sai Prasad Addala *- DGSim: A Scalable and Configurable Framework for Simulating Energy Consumption of Household Appliances*

Arbaaz Dharmavaram Mohammed *- Efficient, Explainable, and Scalable Fact-Checking*

Hanieh Ghabelialla *- Enhancing Anti-Money Laundering Detection with Group aware Deep learning*

Krishno Dey *- Linguistic Patterns and Antipatterns Detection and their Impact on Understandability and Readability of APIs*

Zeynab Anbiaee *- Smart Shields for Smart Health: A Lightweight IDS for IoMT Devices*

Asfia Kawnine *- Towards an Efficient Federated Learning Framework: A Unified Approach for Multi-Tier Spatial Encoding, Spatio-Temporal Modeling, and Multi-Global Server Architectures*

Randeni Arachchige Don Ishan Randeniya *- Vehicular Platoon Simulator*

Seyed Alireza Rahimi Azghadi *- Wearable and Robotic integration for accurate Fall Detection*

Thank you for being part of our 2025 Research Expo!

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