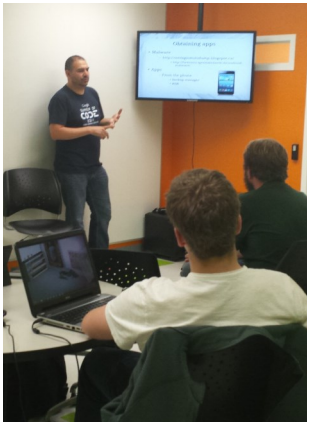
# 15TH ANNUAL
# FACULTY OF COMPUTER SCIENCE
# RESEARCH EXPOSITION
# 2018


UNB EST. 1785 UNIVERSITY OF NEW BRUNSWICK | Computer Science

April 11, 2018 I 8:30am-4:30pm
Wu Conference Centre
Fredericton, NB



# Computing Science Creative Space: CS Square

CS Square is a Creative Space for peer learning, knowledge sharing, and extra-curricular technical-creative IT related activities and entrepreneurship.

The facility also functions as an 'open space' entrepreneurship centre in the Faculty of Computer Science where students, faculty and local industry can meet to collaborate and exchange innovative ideas and vision.

As an INCUBATOR CS Square provides:

- Mentoring and networking opportunities
- Matchmaking with CS entrepreneurs and business leaders
- One-on-one support, advice and counselling for new entrepreneurs
- Workshops and seminars
- Customized business development workshops

# Welcome

Welcome to the 2018 Faculty of Computer Science Annual Research Exposition. I hope that you enjoy the exposition's program and find the experience of meeting and sharing thoughts and ideas with our students and researchers – as well as one another – unique and worthwhile!

The 2018 Faculty of Computer Science Annual Research Exposition showcases the excellent research, new developments, and experience related to the area of information and communication technology. This year we have 37 posters. The coverage of the contributions is very wide while remaining inherently discipline-related, which is one of the features that distinguishes our Research Exposition from other events that focus on more specific areas.

Many people contributed to the success of this Exposition. I would like to thank Dr. Patricia Evans for organizing the Exposition, Ms. Brenda Stennick for providing logistical support, and faculty and staff for supporting and promoting 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 this Exposition: it is your participation that makes it all worthwhile.

Dr. Luigi Benedicenti
Professor and Dean

EST. 1785
UNIVERSITY OF NEW BRUNSWICK
UNB | Computer Science

# Program

**8:30 - 8:50**
Registration

**8:50 - 9:00**
Welcome and Opening Remarks

**9:00 - 9:30**
*Panos Patros*, Faculty of Computer Science - "Memory Management Delays on Cloud Applications"

**9:30 - 10:00**
*Iman Sharafaldin*, Faculty of Computer Science - "Toward Generating a New Intrusion Detection Dataset and Intrusion Traffic Characterization"

**10:00 - 11:00**
*Break & Poster Session I*

**11:00 - 11:30**
*Wei Song*, Faculty of Computer Science - “Mobile Crowdsensing: A Promising Paradigm for Big Data Collection”

**11:30 - 12:00**
*Keith McIntosh,* PQA - “Testing - the path forward”

**12:00 - 13:00**
*Lunch & Poster Session II*

# Program

**13:00 - 13:30**
*Aaron Tabor*, Faculty of Computer Science - “Designing Game-based Myoelectric Training”

**13:30 - 14:00**
*Alina Matyukhina*, Faculty of Computer Science - "Attacking developer's identity in open-source projects"

**14:00 - 14:30**
*Milton King,* Faculty of Computer Science - “Leveraging distributed representations and lexico-syntactic fixedness for token-level prediction of the idiomaticity of English verb-noun combinations”

**14:30 - 15:00**
Break & Poster Session III

**15:00 - 15:30**
*Konstantin Nasartschuk*, Faculty of Computer Science - "Feasibility of Internal Object Pools for Reduced Memory Management"

**15:30 - 15:50**
*Rongxing Lu*, Faculty of Computer Science - "HMM-Based Fast Detection of False Data Injections in Advanced Metering Infrastructure"

**15:50 - 16:10**
*Rick Wightman,* Faculty of Computer Science -“Assisting Rural New Brunswick with IT: Pathfinding”

# Posters

1. Yoann S.M. **Arseneau**, Suprio Ray, Bradford G. Nickerson – Memory Efficient Spatio-Textual Search with Concurrent Updates

2. Deepigha Shree Vittal **Babu** (Master Student) and Rongxing Lu*, Canadian Institute for Cybersecurity (CIC), UNB – Achieve Efficient and Privacy Preserving Range Query over Encrypted Data in Cloud

3. Gerhard **Dueck**, Kenneth B. Kent, Mark Thom (UNB Faculty of Computer Science) Daryl Maier, Mark Stoodley (IBM Canada) – Generic Ahead-of-Time Compilation for Eclipse OMR

4. Taees **Eimouri**, Dr. Kenneth B. Kent (UNB Faculty of Computer Science), Aleksandar Micic (IBM Canada) – Optimizing the JVM Object Model Using Object Splitting

5. Michael **Flawn**, Scott Young, Kenneth B. Kent, Gerhard Dueck (UNB Faculty of Computer Science), Charlie Gracie (IBM Canada) – Implementing a Heap over Multiple Virtual Memory Areas in OMR

6. Aaron G. **Graham**, Jean-Philippe Legault, Dr. Kenneth B. Kent (UNB Faculty of Computer Science), Daryl Maier, James Kingdon (IBM Canada) – Language Runtimes on Embedded Architectures Eclipse Open J9 & Eclipse OMR on ARM aarch64

7. Wei **Guo** (Visiting Student), Jun Shao, Rongxing Lu*, Yining Liu, Ali Ghorbani, Canadian Institute for Cybersecurity (CIC), UNB – A Privacy-Preserving Online Medical Pre-diagnostic Scheme in Cloud Environment

8. Saeed Shafiee **Hasanabadi**, Arash Habibi Lashkari, Ali A. Ghorbani, Canadian Institute for Cybersecurity (CIC), UNB – The Next Generation of Robust Linux Memory Acquisition Techniques via Consequential Timestamp Dumps

9. Hao **Hu**, Maria Patrou, Kenneth B. Kent (UNB Faculty of Computer Science), Michael Dawson (IBM Canada) – Utilize Underlying Hardware Features for Node.js

10. Junaid **Iqbal**, Ratinder Kaur, Natalia Stakhanova, Canadian Institute for Cybersecurity (CIC), UNB – Detection and Prevention of Changes in the DOM Tree

11. Andi Fitriah A. **Kadir**, Natalia Stakhanova, Ali A. Ghorbani, Canadian Institute for Cybersecurity (CIC), UNB – Android Financial Malware Detection Through Network Flow Analysis

12. Ratinder **Kaur**, Yan Li, Junaid Iqbal, Hugo Gonzalez, Natalia Stakhanova, Canadian Institute for Cybersecurity (CIC), UNB – Security Assessment of HCE-NFC enabled E-Wallet Banking Android Apps

# Posters

13. Ratinder **Kaur**, Hugo Gonzalez, Ghazale Amel Zendehdel, Aline Matyukhina, Natalia Stakhanova, Canadian Institute for Cybersecurity (CIC), UNB – Security Vulnerabilities in Networked E-Health Devices

14. Mahsa **Kiani**, Virendrakumar C. Bhavsar, and Harold Boley – Quantifying Simplicity of Generalized Trees

15. Milton **King** and Paul Cook – Leveraging distributed representations and lexico-syntactic fixedness for token-level prediction of the idiomaticity of English verb-noun combinations

16. Arash Habibi **Lashkari**, Andi Fitriah A. Kadir, Laya Taheri and Ali A. Ghorbani, Canadian Institute for Cybersecurity (CIC), UNB – Toward Developing a Systematic Approach to Generate Benchmark Android Malware Datasets and Classification

17. Beibei **Li** (Visiting Student), Rongxing Lu*, Raymond Choo, Wei Wang, and Sheng Luo, Canadian Institute for Cybersecurity (CIC), UNB – On Reliability Analysis of Smart Grids under Topology Attacks: A Stochastic Petri Net Approach

18. Samaneh **Mahdavifar**, Ali A. Ghorbani, Canadian Institute for Cybersecurity (CIC), UNB – Towards a Deep Learning-Based Expert System for Detecting Phishing Attacks

19. Samaneh **Mahdavifar**, Mohammad Rasool Fatemi, Dima Alhadidi, Canadian Institute for Cybersecurity (CIC), UNB – Android Malware Categorization Using a Semi-Supervised Deep Learning Architecture Based on Ladder Networks

20. Hassan **Mahdikhani** (PhD Student) and Rongxing Lu*, Canadian Institute for Cybersecurity (CIC), UNB – *i*HOM: How to Enrich SQL Queries in CryptDB

21. Alina **Matyukhina**, Mila Dalla Preda, Celine Perley, Natalia Stakhanova, Canadian Institute for Cybersecurity (CIC), UNB – Attacking developer's identity in open-source projects

22. Alina **Matyukhina**, Shlomi Linoy, Nguyen Cong Van, Rongxing Lu, Natalia Stakhanova, Canadian Institute for Cybersecurity (CIC), UNB – Identifying smart contract users by analyzing their coding style

23. Puya **Memarzia**, Virendra Bhavsar, and Suprio Ray – Dataset Skew Resilience in Main Memory Parallel Hash Joins

# Posters

24. Konstantin **Nasartschuk**, Kenneth B. Kent (UNB Faculty of Computer Science), Aleksandar Micic (IBM Canada) – Feasibility of Internal Object Pools for Reduced Memory Management

25. Ali Hakimi **Parizi**, Paul Cook – Do Character-level Language Models Capture Knowledge of Multiword Expression Compositionality?

26. Panagiotis (Panos) **Patros** and Kenneth B. Kent (UNB Faculty of Computer Science), Michael Dawson (IBM Canada) – Reducing Garbage Collection Interference on Clouds

27. Rasoul **Shahsavarifar**, David Bremner – Novel Approximation for Halfspace depth

28. Naghmeh **Shahverdi** – Symmetry in Integer Linear Programming

29. Jun **Shao** (Visiting Professor), Rongxing Lu*, Yunguo Guan, and Guiyi Wei, Canadian Institute for Cybersecurity (CIC), UNB – Achieve Efficient and Verifiable Conjunctive and Fuzzy Queries over Encrypted Data in Cloud

30. Iman **Sharafaldin**, Arash Habibi Lashkari, and Ali A. Ghorbani, Canadian Institute for Cybersecurity (CIC), UNB – Toward Generating a New Intrusion Detection Dataset and Intrusion Traffic Characterization

31. Xi **Tao** and Wei Song – Efficient Task Allocation for Mobile Crowdsensing Based on Evolutionary Computing

32. Abhijit **Taware**, Kenneth B. Kent & Gerhard W. Dueck (UNB Faculty of Computer Science), Charlie Gracie (IBM Canada) – Garbage Collection of Cold Regions

33. Maxim **Uzun**, Kenneth B. Kent (UNB Faculty of Computer Science), Michael Dawson (IBM Canada) – Post-mortem Debugging with Promises for Node.js

34. Xue **Yang** (Visiting Student), Rongxing Lu*, Jun Shao, Xiaohu Tang and Ali A. Ghorbani, Canadian Institute for Cybersecurity (CIC), UNB – Achieving Efficient and Privacy-Preserving Multi-Domain Big Data Deduplication in Cloud

# Posters

35. Nafiseh Izadi **Yekta** (Master Student) and Rongxing Lu*, Canadian Institute for Cybersecurity (CIC), UNB – Achieving Communication-Efficient Privacy-Preserving Query for Fog-Enhanced loT

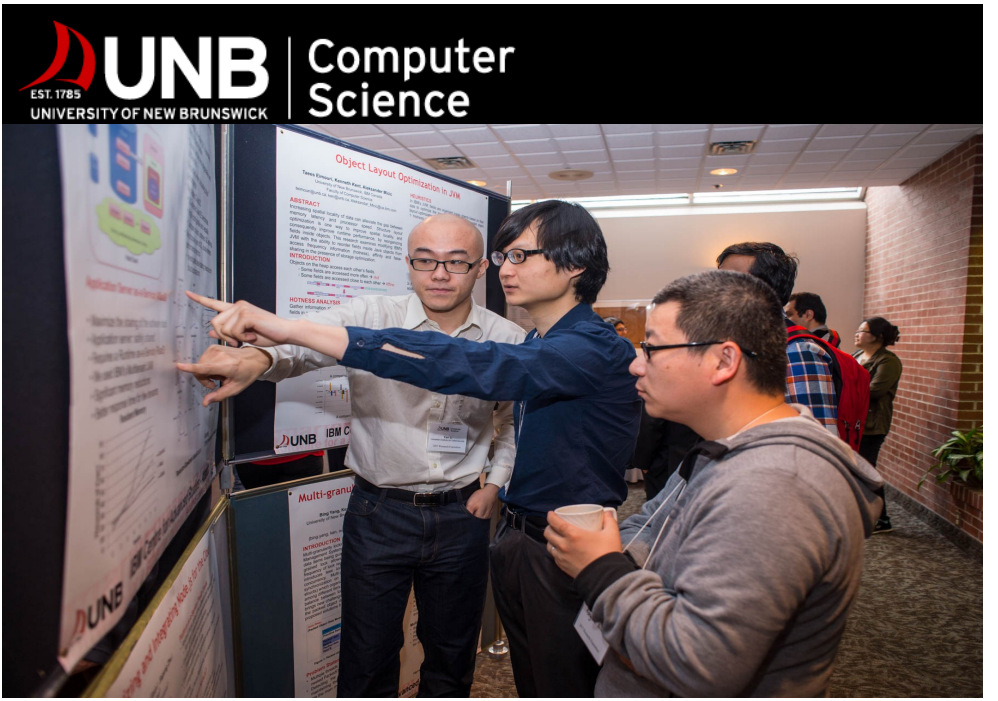
36. Scott **Young**, Kenneth B. Kent, Gerhard Dueck (UNB Faculty of Computer Science), Charlie Gracie (IBM Canada) – Cold Object Segregation

37. J. **Zhu**, P. Patros, K.B. Kent, S.A. MacKay (UNB Faculty of Computer Science), M. Dawson (IBM Canada) – Node.js Scalability Investigation in Clouds

UNB EST. 1785 UNIVERSITY OF NEW BRUNSWICK | Computer Science

# Notes

# Notes




**We at the Faculty of Computer Science pride ourselves on many things.**

We take pride in our history as the first Faculty of Computer Science in Canada and the leader in Atlantic Canada since 1968 with the oldest and most successful co-op program in Atlantic Canada. We take pride in our extraordinary students and in our graduates who have excelled and continue to excel in many different places across Canada and throughout the world. We take pride in our academic excellence, the relevance of our undergraduate programs and our master's and PhD programs to the country and the region, and in the high demand for our graduates regionally, nationally, and internationally. We take pride as well in our faculty and staff who are working hard to ensure the best quality education for our students.

Congratulations to our students and faculty on their research.