



The CORS Bulletin

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IN THIS ISSUE

Dear CORS members,

I am delighted to introduce myself as your new bulletin editor and would like to thank Diane Bischak and Erla Anderson for helping make the transition a smooth one. What better way to familiarise myself with the process than to start with the content-rich, post-conference bulletin.

The issue starts by highlighting the many changes to the CORS council and CORS committees, including messages from outgoing president Corinne MacDonald and incoming president Taraneh Sowlati. Taraneh outlines her plans for 2014-15, including a number of initiatives that will help keep last year's momentum of positive change going strong.

The section on this year's CORS Conference in Ottawa, ON, features some great photos and write-ups of our award winners, including winners of the Award of Merit and the Service Award. There is also a preview for next year's conference in Montreal, QC, from June 14 to 17.

The issue concludes with the newest budget and membership information, and updates from the Special Interest Groups and the CORS Toronto Section.

If you have content you would like to see in the next bulletin, please submit it to me at AndreaFriars@gmail.com.

Cheers,

Andrea Friars

Editor

Editor

Andrea Friars

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Erla Anderson

Elected Officers

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Vice-President
Past-President
Secretary
Treasurer
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Taraneh Sowlati
Fredrik Odegaard
Corinne MacDonald
Dionne Aleman
Navneet Vidyarhi
Xuan Zhao (13/15)
Robert Allie (13/15)
Sonia Vanderby (13/15)
Manish Verma (13/15)

Standing Committees

Awards

Fredrik Odegaard,
Xuan Zhao, Manish Verma
Mehmet Begen
Xuan Zhao
Fredrik Odegaard,
René Séguin,
Louis-Martin Rousseau
Robert Allie
Samir Elhedhli,
Andrea Friars,
Armann Ingolfsson
Taraneh Sowlati,
Corinne MacDonald,
Peter Bell, David Martell,
Richard Caron
Fredrik Odegaard

Education Membership Program

Public Relations Publications

Past Presidents Advisory Board

SIG

Ad hoc Committees

Practice Prize
Student Paper
Competition
Award of Merit

Richard Caron
Benny Mantin, Anjali Awasthi

Financial Planning

Corinne MacDonald,
Pierre L'Ecuyer, Derek Atkins
Navneet Vidyarhi,
Corinne MacDonald,
Taraneh Sowlati,
Fredrik Odegaard

Analytics

Elkafi Hassini,
Mehmet Begen, Robert Allie
Corinne MacDonald
Elkafi Hassini,
Bernard Gendron,
Navneet Vidyarhi,
Armann Ingolfsson
Robert Allie,
Sonia Vanderby
Corinne MacDonald

Nominating INFOR Publisher Search

Membership Survey

Travelling Speakers
Program
INFOR Co-Editors
IFORS Representative
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Samir Elhedhli, Elkafi Hassini
Dionne Aleman
Erla Anderson
Erla Anderson
<http://www.cors.ca>

THE 2014–2015 COUNCIL

CORS Council is made up of the Officers of the Society, four Councillors, the Immediate Past President, a representative designated by each local section of the Society, and the Standing Committee Chairs. Contact information for 2014–2015 Council representatives is provided below. For a complete listing go to www.cors.ca.

President	Taraneh Sowlati, University of British Columbia, taraneh.sowlati@ubc.ca
Vice-President	Fredrik Odegaard, University of Western Ontario, fodegaard@ivey.uwo.ca
Secretary	Dionne Aleman, University of Toronto, aleman@mie.utoronto.ca
Treasurer	Navneet Vidyarthi, Concordia University, navneetv@jmsb.concordia.ca
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Councillor	Xuan Zhao, Wilfrid Laurier University, xzhao@wlu.ca
Councillor	Robert Allie, Weston Foods, robert.allie@readybake.com
Councillor	Sonia Vanderby, University of Saskatchewan, sonia.vanderby@usask.ca
Councillor	Manish Verma, McMaster University, mverma@mcmaster.ca
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Kingston	Jeffrey I. McGill, Queen's University, jmcgill@business.queensu.ca
Toronto	Joseph Milner, University of Toronto, milner@rotman.utoronto.ca
SW Ontario	Fredrik Odegaard, University of Western Ontario, fodegaard@ivey.uwo.ca
Winnipeg	Currently vacant
Saskatoon	Winfried Grassmann, University of Saskatchewan, grassman@cs.usask.ca
Calgary	Mozart Menezes, University of Calgary, mozart.menezes@haskayne.ucalgary.ca
Edmonton	Armann Ingolfsson, University of Alberta, armann.ingolfsson@ualberta.ca
Vancouver	Stuart Donald, University of British Columbia, stuart.donald@sauder.ubc.ca
Toronto Student	Shefali Kulkarni-Thaker and Carly Henshaw, University of Toronto utorg-president@mie.utoronto.ca
Waterloo Student	Saul Qishu Cai, University of Waterloo, saulcai@hotmail.com

RECENT CHANGES TO COUNCIL AND COMMITTEES

Post	Previous	New
Council		
President	Corinne MacDonald	Taraneh Sowlati
Vice-President	Taraneh Sowlati	Fredrik Odegaard
Past President	Elkafi Hassini	Corinne MacDonald
Councillors	Diane Bischak, Jonathan Patrick	Sonia Vanderby, Manish Verma
Standing Committees		
Awards	Taraneh Sowlati, Diane Bischak, Robert Allie	Fredrik Odegaard, Xuan Zhao, Manish Verma
Past Presidents Advisory Board	Elkafi Hassini, Corinne MacDonald, Peter Bell, David Martell, Richard Caron	Taraneh Sowlati, Corinne MacDonald, Peter Bell, David Martell, Richard Caron
Program	Taraneh Sowlati, René Séguin	Fredrik Odegaard, René Séguin, Louis-Martin Rousseau
Publications	Bernard Gendron, Diane Bischak, Armann Ingolfsson	Samir Elhedhli, Andrea Friars, Armann Ingolfsson
SIG	Taraneh Sowlati	Fredrik Odegaard
Ad hoc Committees		
Analytics		Elkafi Hassini, Mehmet Begen, Robert Allie
Financial Planning	Navneet Vidyarathi, Elkafi Hassini, Corinne MacDonald, Taraneh Sowlati	Navneet Vidyarathi, Corinne MacDonald, Taraneh Sowlati, Fredrik Odegaard
INFOR Publisher Search	Elkafi Hassini, Bernard Gendron, Samir Elhedhli, Navneet Vidyarathi, Armann Ingolfsson	Elkafi Hassini, Bernard Gendron, Navneet Vidyarathi, Armann Ingolfsson
Award of Merit	Elkafi Hassini, Derek Atkins, Oded Berman	Corinne MacDonald, Pierre L'Ecuyer, Derek Atkins
Nominating	Elkafi Hassini	Corinne MacDonald
Travelling Speakers Program	Elkafi Hassini	Corinne MacDonald
Membership Survey		Robert Allie, Sonia Vanderby
INFOR Co-Editors	Bernard Gendron	Samir Elhedhli, Elkafi Hassini
CORS Bulletin Editor	Diane Bischak	Andrea Friars

OUTGOING PRESIDENT'S MESSAGE

Dear CORS Members,

Let me start by saying it's been an honour and a privilege to serve as your president this past year. I'd like to thank everyone on council, especially our outgoing councillors, Diane Bischak (Bulletin Editor) and Jonathan Patrick (Conference Program co-Chair). I also want to thank Bernard Gendron, who is stepping down as INFOR editor after several years. As he mentioned, we hope to have this sorted out very shortly, as well as a new plan for INFOR going forward.

I'd like to take this opportunity to review some of the work of Council over this past year. We held our first official Past President's Breakfast on the first day of the conference. We had a very interesting conversation about the future of CORS and Analytics. We previously established a committee to look into this issue and as Past President I will be taking over as chair from Elkafi Hassini, and I look forward to a lot more discussion on how we go forward. I also look forward to engaging our Past President's group for more input on this and other issues from Council.

We have made several changes to our administrative procedures that are now documented in our Administrative Handbook, and we have a fairly comprehensive handbook for conference organizing that I understand was very helpful for the Ottawa group. We did change the way renewal invoices and reminders are sent to members to ensure more timely submission of dues and less administrative work for our membership services provider. We have also revised the procedures for our treasurer and re-activated the Financial Planning Committee to spend more time considering the budget prior to the AGM.

Our financial situation has improved greatly, thanks mostly to three very successful conferences in a row; however, as a small society, our finances are always a concern. One issue we had to deal with this year was the decision by SSHRC to change their graduate student funding program so that our conference is no longer eligible for graduate student support. This grant was what we used to help pay for students to attend this conference, and this past year we committed to spending some money but again this amount was very, very low. At our last council meeting of the year, we made a decision that we needed to commit to supporting our graduate students coming to the annual conference, so we have created what we are calling a Student Support Fund. This money will be used primarily to support graduate students attending the CORS conference. Council will need to decide each year how much to add to the fund and how to allocate that money, while keeping one eye on our financial situation.

One thing I have been talking about in Bulletin messages this past year is volunteering. I know that for many of you, your time is stretched and it seems as though there are more and more demands on it every day. But keeping this society going requires its members to volunteer to serve on Council, at the local chapter levels, as committee chairs, judges, conference organizers, etc. It is a rewarding experience and it is important to keep new blood on Council for fresh ideas and to ensure the continuation of the society. If you haven't thought about it before, please consider it now.

To conclude, I wish all the best to our 2014-15 president, Taraneh Sowlati, and I look forward to continuing to serve the society on Council.



Corinne MacDonald



ADDRESS OF THE INCOMING PRESIDENT

Dear CORS Members,

It is a great honour for me to serve as president of our society in 2014-2015. I would like to start by thanking each and every one of you for being a CORS member and attending the conference this year. Your membership and participation in the conference are much appreciated. I also thank this year's conference organizers, Rene Seguin, Jonathan Patrick and Yiqiang Zhao, all cluster chairs and all the presenters for their contributions.

I would like to take this opportunity to thank Corinne MacDonald, CORS past president, and our outgoing councillors. And I welcome our new and returning councillors, officers, committee chairs, and our vice president, Fredrik Odegaard.

Let me talk about myself and my plans for the coming year briefly. My association with CORS started about 15 years ago as a graduate student and during the past eight years I have served the society at local and national levels as president of Vancouver chapter, councillor, membership committee chair, and annual conference chair in Vancouver in 2013. I have been fortunate to serve at CORS council working with many driven individuals who devote their time and effort to take care of our society's affairs. I thank Evelyn Richards for introducing me to the council. During my work at the council, I have seen how the responsibilities and duties are shared among council members. I am saying this because during our past two council meetings here in Ottawa and our past presidents' breakfast, we have discussed exciting opportunities and potential directions for CORS as Corinne explained that would require a lot of work in the coming years, but I have no apprehensions about the work ahead of us this year and I am sure as always the work will be shared among council officers and members, committees, other volunteers and myself.

Over the past few years we have seen a number of positive changes and initiatives, such as changes to our constitution, formation of CORS special interest groups, development of our new website, establishment of past presidents' advisory committee for strategic planning, in order to improve the well-being of our society. Moreover, efforts were made to address perhaps our main pressing issue which was to balance the budget by reducing the cost of face-to-face council meetings using Skype teleconferencing, and mail delivery costs using email communication and online publishing of the bulletin. We were also fortunate to have past conferences that generated profit for us (and we hope this one will be one of those) and we have seen great participation in our SIGs organized sessions during our conferences. All of these were in the right direction, but adequate planning is required for the coming years due to circumstances that have been developing. As Corinne explained the SSHRC conference grant is eliminated and we decided to continue this support because of the importance of graduate students to our society, but in order to maintain or increase this support we need to be able to increase our revenues, cost cutting options are not sufficient any more. We also heard from Corinne about discussions related to analytics and whether including it in our name and activities would increase our membership and make our society stronger. We are in the process



of having a new journal editor and potentially a new publisher and again there are discussions about the future of our journal. Moreover, we need to find ways to increase our industry membership and attract companies to participate and support our conferences financially. My goal in the coming year is to focus our efforts in the council on addressing the new circumstances by continuing discussions on analytics, industry membership, and our journal, getting input from our members and making proper decisions to take advantage of the new opportunities ahead of us and to position ourselves well.

At the end, I would like to invite those of you who would like to volunteer and support us in any of our initiatives this year or those who have any suggestions for improvements to contact me or any of the council members. I am looking forward to serving our society and working with CORS council in the coming year. I hope you enjoy the rest of the conference and look forward to seeing all of you in Montreal next year. Thank you very much.



Taraneh Sowlati

COUNCIL CORNER

This section of the CORS Bulletin will highlight recent discussions by the CORS Council and motions of particular interest that have been passed.

- **New Memberships:** The Council passed a motion that will regulate membership fees for members who join the society in different periods of the society's fiscal year. New applications for membership that come in between April 1 and September 30 will be billed for the current year. New memberships that come in between October 1 and March 31 will be billed for the next year.

2014 CORS AWARD WINNERS

Congratulations to the following winners of the awards and prizes presented at CORS 2014 in Ottawa, ON. Special thanks to all the participants and to the judges of the Student Paper Competition. More details on all CORS Awards and prizes, including a complete list of past winners, can be found by visiting the CORS website (www.cors.ca).

Prize	Recipients
Harold Larnder Prize	Jonathan Rosenhead , Professor of Operational Research, London School of Economics, "Can OR help in a Crisis?"
The CORS Award of Merit	Pierre L'Ecuyer , Canada Research Chair in Stochastic Simulation and Optimization, Département d'informatique et de recherche opérationnelle, Université de Montréal
Omond Solandt Award	IBM
The CORS Service Award	Diane Bischak , Professor, Operations and Supply Chain Management, Haskayne School of Business, University of Calgary
The CORS Practice Prize	<p><u>First Place</u> Fletcher Lu, Craig Trought, University of Ontario Institute of Technology, "<i>Computational Efficiencies in Insurance Fraud Data Analysis</i>"</p> <p><u>Second Place</u> Daniel Karapetyan, Abraham Punnen, Simon Fraser University, "<i>Operational Research Models and Algorithms for Fleet Size Planning and Schedule Optimization for the British Columbia Ferry Services Inc.</i>"</p>
Student Paper Competition	<p><u>Open Category: First Prize</u> Auyon Siddiq, University of Toronto, "<i>Robust Facility Location Under Demand Location Uncertainty</i>"</p> <p><u>Open Category: Honourable Mention</u> Vahid Sarhangian, University of Toronto, "<i>Allocation Policies in Blood Transfusion</i>"</p> <p><u>Undergraduate Category: First Prize</u> Kishley Bhalla, Craig Mathews, W Brett Robinson, Katie Sclater, Simon Fraser University, "<i>Selecting Optimal Tolling Levels: A Case Study for the Fraser River in the Greater Vancouver Area</i>"</p> <p><u>Undergraduate Category: Honourable Mention</u> Nicole Mo, Alborz Namazi, Joyce Tai, Eric Yuen, Simon Fraser University, "<i>Optimal Locations of Telecommunication Equipment: A Case Study for the City of Richmond, British Columbia, Canada</i>"</p>
CORS Forestry SIG David Martell Student Paper Prize	Gregory Paradis , Université Laval, " <i>On the risk of systematic drift under incoherent hierarchical forest management planning</i> "
CORS Queueing Theory SIG Student Paper Prize	Jianfu Wang , University of Toronto, " <i>Using Strategic Idleness to Improve Customer Service Experience in Service Networks</i> "

2014 Harold Larnder Award Winner: Jonathan Rosenhead



Jonathan Rosenhead (right) accepts the Harold Larnder Award from David Stanford

Jonathan Rosenhead is Emeritus Professor of Operational Research at the London School of Economics, where he was first appointed to the academic staff in 1967. Prior to that he worked in the steel industry, and in consulting. He is perhaps most widely known for his edited book *Rational Analysis for a Problematic World Revisited*, which established the field of Problem Structuring Methods (sometimes called Soft OR). While President of the UK Operational Research Society 1986-7 he launched the Community Operational Research initiative for the practice of OR for grass-roots organisations, a strand of OR which still continues. He was chair of the jury of the IFORS Operational Research in Development Prize at the Vancouver IFORS Conference in 1996. From 2000 to the present he has been a consultant to the Ministry of Planning of the Government of Venezuela. He has published on the history of OR, and on health service planning where he also has a consulting practice. He holds the UK OR Society's President's, Goodeve and Beale Medals. Outside Operational Research he has been a Parliamentary candidate for the UK Labour Party, and chaired the British Society for Social Responsibility in Science. He is currently Chair of the British Committee for the Universities of Palestine.

2014 CORS Award of Merit Winner: Pierre L'Ecuyer



Bernard Gendron (left) accepts the award on behalf of Pierre L'Ecuyer from Elkafi Hassini

Dr. Pierre L'Ecuyer is a Canada Research Chair and Professor in the "Département d'informatique et de recherche opérationnelle" (IRO) at the University of Montreal. He is a prolific scholar in the area of simulation and random numbers generation. He has published 236 refereed articles and book chapters and has 300 conference presentations.

Armann Ingolfsson wrote that "Pierre has developed some of the most sophisticated and best known pseudo random number generators, which are used in some of the best known commercial simulation software packages, such as Arena and Automod. In my opinion, this is a major contribution to both theory and practice... In addition to his work on random number generation and simulation methodology, he has made major contributions to the literature on call centre operations." He has developed the SSJ (Stochastic Simulation in Java) library for discrete event simulation as well as ContactCenters and TestU01, a gold standard for testing RNGs for both simulation and cryptography.

Pierre has supervised over 64 graduate students and postgraduate fellows. Armann adds that "I have met a few of his students and postdoctoral fellows. I have been impressed by all of them and it is clear to me that Pierre contributed greatly to their training in operations research."

In addition to his scholarly contributions, Pierre has been very active in the operations research community. He is the editor-in-chief of the ACM Transactions on Modeling and

Computer Simulation (TOMACS) and serves as an associate editor of many journals such as Management Science, ITOR, ACM TOMS, ACM TOMACS, and Statistics and Computing. He has been a referee for 127 different scientific journals, for several conference proceedings, and books. He has organized several international conferences and workshops. He also regularly serves on conference program committees to the tune of 3-4 per year.

Not surprising, this career has earned Pierre a multitude of awards and recognitions. Among them is being a Canada Research Chair (2004-2017), INFORMS Simulation Society Outstanding Research Publication Award in 1999 and in 2009, INFORMS Fellow, Killam Research Fellowship (2001), Steacie Fellow (NSERC, 1996), and the 2002 Urgel-Archambault Prize, from ACFAS, for "exceptional scientific contribution by a French Canadian to the areas of physics, mathematics, and engineering."

In his spare time, Pierre competes as cyclist and serves as a track and field coach. In fact he has been four times Canadian champion in cycling and has coached the Barcelona Olympic Games silver medalist Guillaume Leblanc (20 km walk) from 1973 to 1992.

2014 Omond Solandt Award Winner: IBM



René Séguin presents the Omond Solandt Award

IBM has long been a supporter of the Operations Research committee and especially so since its acquisition of ILOG and the further enhancements it has made to CPLEX through its Optimization Studio. IBM now offers a range of software tools conducive to operations researchers from statistical packages to forecasting to optimization. Through their academic initiative, these tools have been made available at no cost to professors and students. It is for these reasons that the committee is pleased to offer the 2014 Omond Solandt award to IBM.

2014 Service Award Winner: Diane Bischak



Mozart Menezes (right) accepts the award on behalf of Diane Bischak from Taraneh Sowlati

Diane Bischak is Professor of Operations and Supply Chain Management at the Haskayne School of Business at the University of Calgary. She has served in OR societies in Canada, New Zealand and the United States. She has just completed a term as CORS Councillor and has previously served the Calgary Chapter of CORS as President, Vice-President, and Program Director.

2014 CORS Practice Prize Winners

The CORS Practice Prize recognizes an outstanding application of operational research that has had a significant, verifiable and quantifiable impact on the performance of the client organization. The judging team of Rick Caron (University of Windsor), Peter Vanberkel (Dalhousie University), Sophie D'Amours (Université Laval) and Derek Atkins (University of British Columbia) were pleased and impressed with the quality and diversity of the five finalists. Our thanks go out to all competitors for their valued participation in the competition and for their excellent presentations. We are pleased to announce, and congratulate, in this Bulletin, the first and second place winners.

The first place winner is the team of Fletcher Lu and Craig Trought from the University of Ontario Institute of Technology for their project, "Computational Efficiencies in Insurance Fraud Data Analysis". They share a prize of \$1,000. Their project combines Dynamic Programming with Markov Decision Processes to find new fraud patterns from real health insurance records supplied by their partner Medavie Blue Cross. Medavie is a private health insurance business with nearly two thousand employees across Canada. In 2012 they processed over 31 million insurance claim transactions involving in excess of \$3.48 billion. Their algorithms resulted in changes that reduced the processing time for one of their fraud searches from over 35 hours to less than 1 minute; and their search uncovered several potential new invalid insurance claims patterns with results of questioned claims yielding a 12.1% rate of claims returning funds.

The second place winner is the team of Daniel Karapetyan (University of Nottingham) and Abraham Punnen (Simon Fraser University) for their project "Operational Research Models and Algorithms for Fleet Size Planning and Schedule Optimisation for the British Columbia Ferry Services Inc.". They share a prize of \$800. BC Ferries carries about 20M passengers per year with a fleet of 35 vessels making it the second largest passenger ferry company in the world. The aim was to perform an analysis of possible fleet configurations and develop preliminary service schedules. They proposed a compact graph representation of the ferry flow network and an efficient algorithm for the passenger flow computations and designed a hybrid evolutionary algorithm using very large scale neighbourhood (VLSN) search. Their algorithm generated a number of highly-optimised schedules for each day of the week, for each season, and for each fleet configuration. The outcomes were approved by BC Ferries management and informed a major capital investment decision to upgrade the fleet configuration.



Fletcher Lu (right) accepts the First Place CORS Practice Prize from Richard Caron



Abraham Punnen (right) accepts the Second Place CORS Practice Prize from Richard Caron

2014 CORS Student Paper Competition

Open Category

By Benny Mantin, Department of Management Sciences, University of Waterloo
Chair of the Open Category Committee

The CORS Student Paper Competition was very popular again this year. In the Open Category, 14 submissions were received. The judges of the submitted papers were:

Opher Baron, University of Toronto
Manish Verma, McMaster University
Ginger Y. Ke, Memorial University of Newfoundland
Timothy C. Y. Chan, University of Toronto
Stanko Dimitrov, University of Waterloo
Pierre L'Ecuyer, Université de Montréal
Samir Elhedhli, University of Waterloo
Louis-Martin Rousseau, École Polytechnique de Montréal
Fatma Gzara, University of Waterloo
Hossein Abouee-Mehrizi, University of Waterloo
Jonathan Patrick, University of Ottawa
Hubert Pun, Western University
Derek Atkins, University of British Columbia
Mikhail Nediak, Queen's University
Tim Hua, University of British Columbia

Based on feedback from the judges, 5 finalists were selected to present their work at the CORS Annual Conference: Mohammad Delasay (University of Alberta), Auyon A. Siddiq (University of Toronto), Assadipour Ghazal (Memorial University), Vahid Sarhangian (University of Toronto), and David Wheatley (University of Waterloo).

Mehmet Begen, Western University, and Benny Mantin judged presentations of the Open Category finalists.



Auyon Siddiq (left) accepts the Open Category First Prize from Mehmet Begen

The First Prize in the Open Category was awarded to Auyon A. Siddiq (University of Toronto) for the paper "Robust Facility Location under Demand Location Uncertainty":

Most classical facility location models assume demand locations are known at the time of facility siting. In many practical applications, however, the locations of demand points are subject to uncertainty. In this paper, we develop a two-stage robust facility location framework wherein each demand point can be realized within a continuous, bounded uncertainty region, and assignment decisions occur after the demand locations are revealed. We use a conditional value-at-risk objective, which induces a family of location models including robust analogues of the p -median and p -center problems under demand location uncertainty. Our approach discretizes each uncertainty region into a finite set of scenarios that represent possible locations for the realization of the demand point. We develop a row-and-column generation solution algorithm that scales efficiently with the discretization granularity. We also derive bounds on the error introduced by discretizing the continuous uncertainty regions as a function of the discretization granularity. Lastly, we present numerical results that demonstrate the value of hedging against demand location uncertainty in two applications related to emergency response.



Vahid Sarhangian (left) accepts the Open Category Honourable Mention Prize from Mehmet Bege

The honourable mention was awarded to Vahid Sarhangian (University of Toronto) for the paper "Allocation Policies in Blood Transfusion":

Red Blood Cell (RBC) transfusion is an integral part of many medical treatments and surgeries. Recently, a growing body of research suggests a correlation between the age of transfused blood and adverse clinical outcomes for its recipients. Therefore, there is a need for effective and practical inventory management policies which could reduce the age of transfused RBC units without compromising their availability. In this paper, we focus on policies which determine how RBC units are allocated to patients. We study a stylized queueing model of a hospital blood bank and consider a family of threshold allocation policies, previously introduced in the literature. We characterize the sojourn time distribution of RBC units in inventory and calculate the distribution of the age of transfused units, as well as the proportion of lost demand and outdates. Our analysis allows us to capture the age-availability trade-off achieved under the threshold policy. In a numerical study, we explore the factors affecting the performance of the threshold policy and investigate when it is more likely to be effective as an alternative to reducing the shelf-life. We find that when reducing the shelf-life has a high impact on availability, the threshold policy is more effective. This is observed, in particular, for blood types with lower demand, for smaller hospitals, and when a lower age of transfused RBCs is required. Furthermore, using hypothetical models mapping the age of RBCs to the corresponding probability of adverse medical outcomes, we examine the trade-off between availability and the health outcomes achieved under the threshold policy. In particular, we demonstrate the importance of taking into account the underlying relationship between the age of RBCs and the corresponding health outcomes when considering allocation policies for RBCs.

Undergraduate Category

By Anjali Awasthi, Concordia University, Chair of the Undergraduate Category Committee

This year, we received 9 submissions in the Undergraduate Category, out of which 4 were retained as finalists for the Oral Presentation. The judging committee was comprised of 7 members whose details are as follows:

Prof. Simon Li, Mechanical Engineering, University of Calgary
Prof. Xiao Huang, JMSB, Concordia University
Prof. Pascal Forget, Industrial Engineering, Université de Quebec a Trois Rivières
Dr. Hichem Omrani, CEPS/INSTEAD, Luxembourg
Dr. Tai-yu Ma, CEPS/INSTEAD, Luxembourg
Prof. Govind Gopakumar, CES, Concordia University
Prof. Anjali Awasthi, CIISE, Concordia University



(L-R) Craig Mathews, Katie Sclater, and W Brett Robinson accept the Undergraduate Category First Prize from Mehmet Begen

First Prize was awarded to Kishley Bhalla, Craig Mathews, W Brett Robinson, and Katie Sclater of Simon Fraser University for their paper "Selecting Optimal Tolling Levels: A Case Study for the Fraser River in the Greater Vancouver Area"

The recent addition of a toll on the Port Mann Bridge in Greater Vancouver has resulted in an observed increase in traffic volumes on alternate routes crossing the Fraser River. The result has been lower than expected volumes on the Port Mann Bridge and increased congestion on other major arteries in the region. This paper describes the development of a mathematical programming model to determine an optimal tolling system for the four main Fraser River crossings in the Greater Vancouver area: the Port Mann Bridge, the Alex Fraser Bridge, the Pattullo Bridge, and the Massey Tunnel. Two scenarios are discussed, starting with the current situation of one toll on the Port Mann Bridge, while the second will open the possibility of implementing a toll on all four crossings. The intention is to minimize congestion in the region through the redistribution of traffic.



Eric Yuen (centre) and Nicole Mo (right) accepting the Undergraduate Category Honourable Mention Prize from Mehmet Begen

Honourable Mention was awarded to Nicole Mo, Alborz Namazi, Joyce Tai, and Eric Yuen of Simon Fraser University for their paper "Optimal Locations of Telecommunication Equipment: A Case Study for the City of Richmond, British Columbia, Canada"

Telecommunication service providers are competing in an environment where the pervasive nature of the mobile technology requires them to establish an improved network system with stronger signals and wider coverage to satisfy the escalating demand. This paper tackles one of the most fundamental challenges in achieving this goal, determining the optimal locations of cell sites given various constraints (costs, access, demographics, and etc.). The telecommunication sites problem is formulated as a combination of maximum coverage location problem (MCLP) and the assignment problem, where the objective is to maximize the coverage while minimizing the total cost (both monetary and nonmonetary). This problem is divided into multiple parts where the initial objective is to determine the optimal number of cell sites and their locations in order to achieve a full coverage; next, it forecasts the optimal location of cell sites having various constraints in place. This paper focuses on City of Vancouver, where various attributes including the population density, average household income and other demographics are built into the model.

CORS Forestry SIG David Martell Student Paper Prize: Gregory Paradis



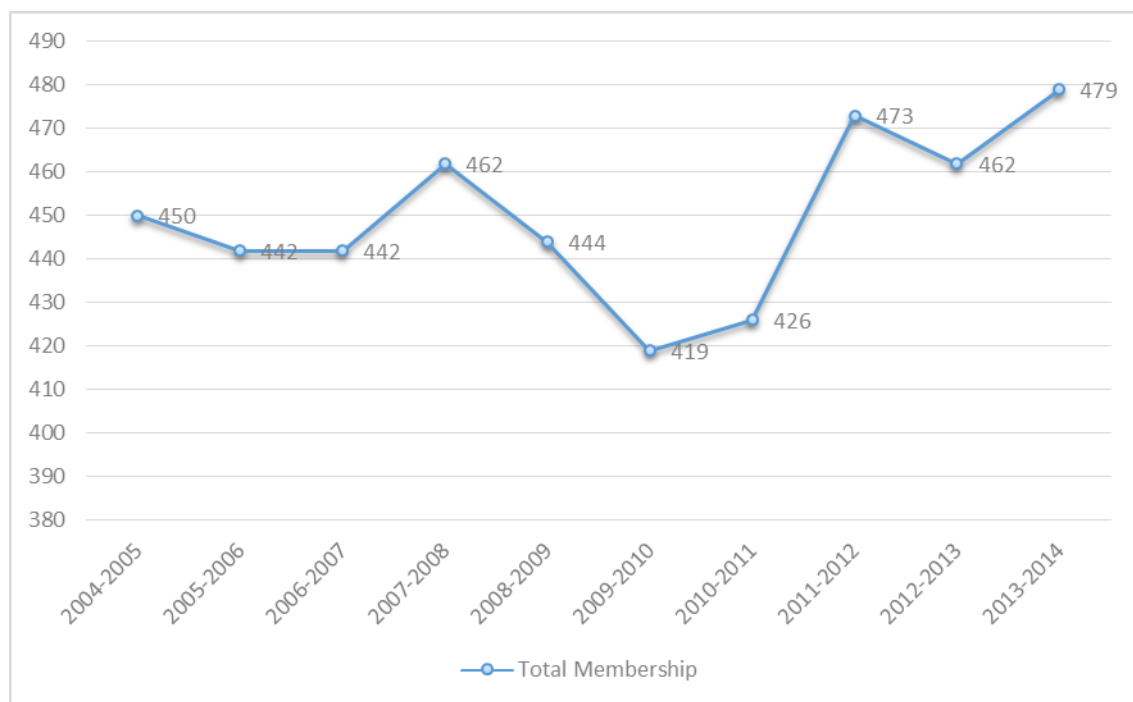
Gregory Paradis (centre) accepts the CORS Forestry SIG David Martell Student Paper Prize from (L-R) Jean-François Audy, David Martell, and Mikael Rönnqvist

2014–2015 CORS BUDGET

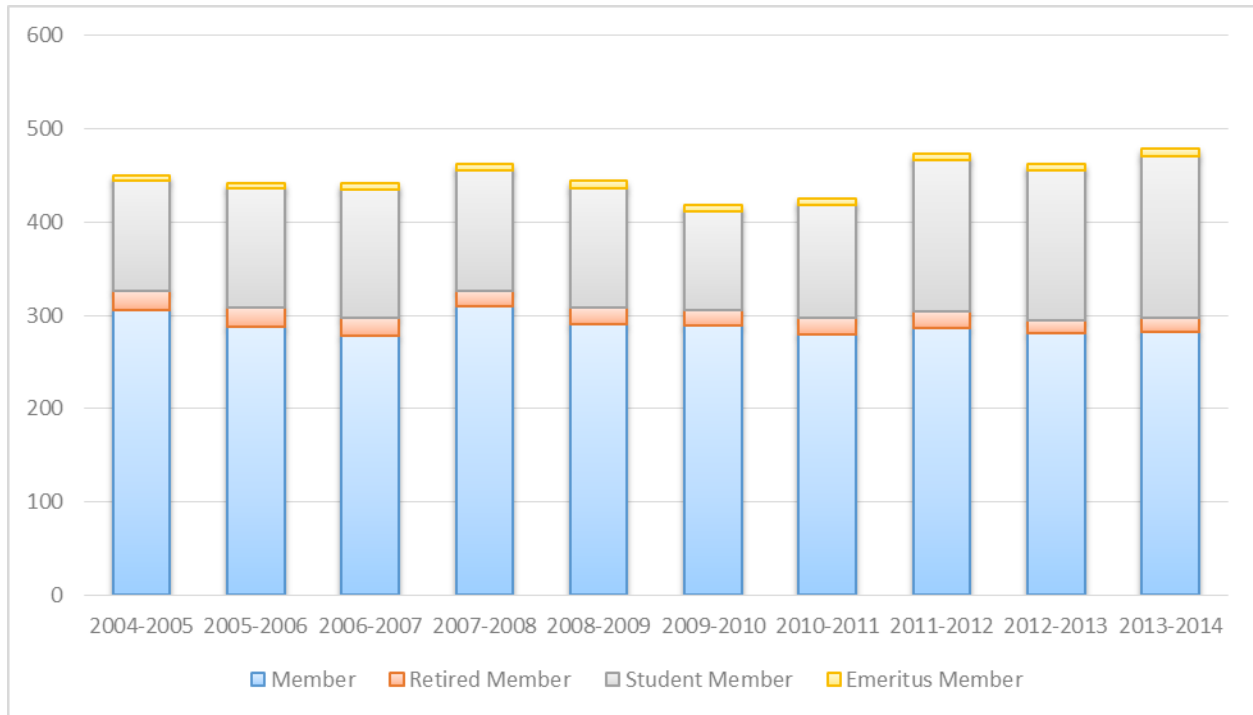
	2013-14 Budget	2013-14 Actual	2014-15 Budget
I. Receipts			
Membership Dues	35,000.00	41,850.00	35,000.00
Conference Profit	20,000.00	28,456.67	7,500.00
SSHRC Conference Grant	7,125.00	0.00	
INFOR Royalty/Profit	200.00	253.56	200.00
Miscellaneous	0.00	0.00	0.00
Total Receipts	\$62,325.00	\$70,560.23	\$42,700.00
II. Expenses			
Administrative Expenses	17,000.00	13,408.80	15,000.00
Bulletin	2,500.00	1,407.68	2,000.00
SSHRC Conference Grant	7,125.00	-	-
Council Meeting	2,500.00	5,708.44	4,000.00
Sections Shares of Dues	3,500.00	2,855.69	3,500.00
Sections Shares of Conference Profit	2,250.00	2,672.83	875.00
INFOR Journal	5,000.00	0.00	10,000.00
IFORS Subscription	450.00	440.60	450.00
Awards	3,000.00	2,150.00	5,000.00
Graduate Student (non-CORS) Conference Support	2,000.00	300.00	
Travelling Speaker Program/CORS Events	2,000.00	1,723.55	2,000.00
Teaching Effectiveness Colloquium Faculty Support	1,000.00	0.00	
GST/HST	2,000.00	-	2,000.00
Bank and Credit Card Charges	5,000.00	2,968.18	3,000.00
Web Services	10,000.00	2,547.43	7,500.00
CORS Graduate Student Conference Funding		3,810.00	8,000.00
Total Expenses	\$65,325.00	\$39,993.20	\$63,325.00
Expected Profit/Loss	(\$3,000.00)	\$30,567.03	(\$20,625.00)
III. Balances			
Opening Balance (as of April 1)		\$93,735.34	
Adjustments:			
Closing Balance (March 31)		\$116,297.70	

2013–2014 CORS MEMBERSHIP REPORT

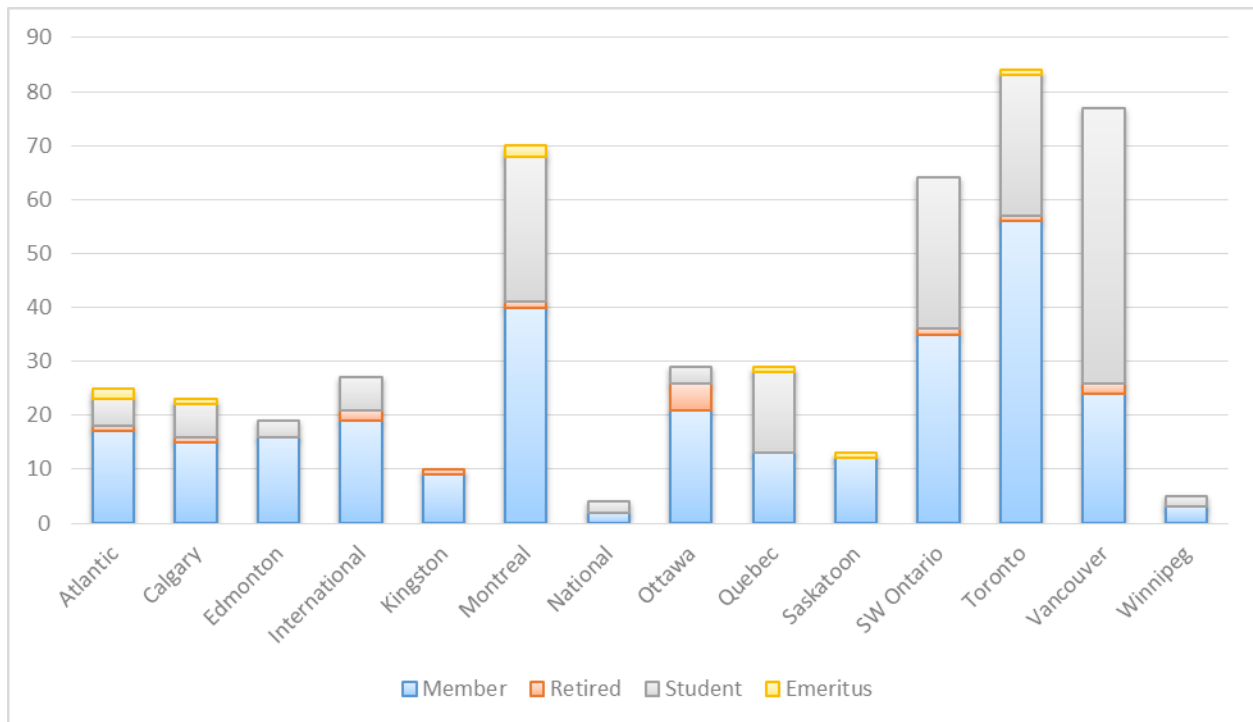
I am pleased to submit a copy of the 2013–2014 Annual Membership Report of the Canadian Operational Research Society, which documents the membership activities experienced by the Society over the past year, for the CORS Council consideration. The report provides Council with the information it needs to assess the health and well-being of the Society; to monitor the effectiveness of membership processes and practices; and to identify areas where policy initiatives or changes may be required. This report reveals that CORS experienced an increase in membership in 2013–2014 of 4%. These graphs summarize the report, which can be seen in full on the CORS website.



CORS Membership 2004-2014



CORS Membership by Member Type 2004-2014



CORS Membership by Section and Member Type March 31, 2014



<http://meetings2.informs.org/montreal2015>

Why Attend the Conference?

There are many good reasons to attend this jointly-sponsored international conference. You will:

- Gain a cross-cultural view of the latest O.R. and analytics trends
- Enjoy regional diversity through structured networking with international colleagues
- Have your work viewed in a different light with varying perspectives from distinguished experts
- Benefit from exposure to the fullest spectrum of O.R. and analytics research and topics
- Learn from top industry vendors who are attracted to this international forum
- Fully immerse yourself in this charming French-Canadian city and all it has to offer

The meeting will take place at the Le Centre Sheraton Hotel Montreal. In addition to the technical tracks, there will be competitions and several receptions. Finally, while you are in the city, please do partake in some of the region's attractions.

A Parisian New York or vice versa, but definitely a spirited, bold and complex mix of contrasts that completely defies comparison. Montréal's renowned duality of Old World charm infused with North American energy lies at its very heart; however, it is the *plurality* of cultures that really makes this metropolis tick. Montréal is as romantically traditional as it is cutting-edge innovative, as cosmopolitan dynamic as it is small-town friendly. Yet despite this diversity, an underlying homogeneity exists in this vibrant population who collectively and confidently "live and let live"—and do it well. Bohemian? Maybe. Uplifting? Definitely. After spending some time here, you'll notice that without the complex mix of flavours—ethnicity, culture, language, ideas, cuisine, you name it—warm camaraderie and sheer joie de vivre, anywhere else just seems bland. (*From Tourism Montreal*)

June 14 – June 17, 2015
Sheraton Montreal

Submission Deadline: Jan. 16, 2015

General Chair:

Louis-Martin Rousseau Ph.D.

louis-martin.rousseau@cirrelet.net

CORS SPECIAL INTEREST GROUPS (SIGs)

CORS Council approved a policy on Special Interest Groups (SIGs). A SIG provides a mechanism to promote CORS, the SIG area and the SIG members, as well as the opportunity for CORS members with common interests to interact and network.

SIGs formed so far include:

- CORS Queueing Theory SIG: contact Doug Down (downd@univmail.cis.mcmaster.ca, McMaster University, Department of Computing and Software).
- CORS Health Care Operational Research SIG: contact John Blake (john.blake@dal.ca, Dalhousie University, Department of Industrial Engineering).
- CORS Forestry SIG: contact Jean-François Audy (Jean-Francois.Audy@cirrelt.ca, Researcher & Network Liaison Manager at the NSERC Strategic Research Network on Value Chain Optimization), or go to <http://cors-forestrysig.pieorswirls.com/>.

If you would like to join a SIG, contact the persons listed above, or simply indicate that you would like to join when you renew your CORS membership.

CORS encourages members with common interest in an area within or related to operational research to form additional SIGs. More information about SIGs can be found online at <http://www.cors.ca/en/membership/index.php>. Discussions are underway about forming SIGs in several additional areas. If you are interested in forming a SIG in a particular area, then feel free to contact the CORS SIG Committee Chair: Fredrik Odegaard (fodegaard@ivey.uwo.ca).

CORS SIG NEWS

Forestry

The OR in forestry cluster program at CORS AC 2014 was a great success with 35 regular talks split into 9 sessions and, thanks to the financial support from the VCO Network, a workshop consisting of three special sessions:

- An international tutorial by Mikael Frisk on the challenges and experiences in implementing OR for solving industrial problems in forest value chain. The tutorial was followed by a discussion session with three additional speakers (Dirk Kloss, Catalin Ristea and Mikael Rönnqvist) who briefly share additional thoughts.
- A presentation by the three 2014 finalists (Rezvan Rafiei, Sanjay D. Jena and Gregory Paradis) of the David Martell Student Paper Prize in Forestry. Congratulation to 2014 winner, Gregory Paradis!
- An industrial problem presentation and discussion session where three Ph.D. students (Taiwo O. Adetiloye, Amine Amrouss and Gregory Paradis) introduce their ongoing work and received valuable feedback through an open discussion with the attendees.

Special thanks to all speakers, session chairs and the cluster program co-chairs, Mikael Rönqvist and Jean-François Audy, for their contributions. The annual meeting allow to review the FSIG activities and initiatives since last annual meeting (e.g. communication tools, INFOR special issue, best student paper prize) and to set-up a process to adopt the FSIG bylaws. If you would like to join the Forestry SIG, please contact Jean-François Audy (jean-francois.audy@cirrelt.ca).

Queueing

The Queueing SIG had a strong presence at the most recent CORS conference in Ottawa, with six sessions. We also had the pleasure of announcing the second annual Student Paper prize - the winner this year is Jianfu Wang, for his paper "Using strategic idleness to improve customer service experience in service networks," co-authored with Opher Baron, Oded Berman and Dmitry Krass.

Doug Down

CORS SECTIONS NEWS

Toronto Student

CORS/INFORMS Toronto Student Chapter held 7 academic and 2 social events since March 2014, including:

- Meet and Greet with MIE Seminar Speaker: Dr. Marty Puterman, Sauder School of Business, UBC (April 4)
- "A Social Networking Model for Influence Estimation and User Behaviour Prediction", Dr. Kevin Ferreira, Adjunct Professor, MIE (April 22)
- Board game night (April 30)
- Student talks by Hootan Kamran Habibkhani and Vahid Sarhangian (May 5, May 20)
- Participated as a UTOORG team in a fun 5km run "Colour Me Rad" (May 31)
- Teaching Workshop by Daria Terekhov and Kimia Ghobadi (June 10)
- Melbourne-Toronto Mini Symposium, with talks by Michelle Bloom and Christina Burt from Melbourne University and Sebastian Kosch and Wen-Yang Ku from the University of Toronto (June 16)
- LaTeX Workshop by Professor Dionne Aleman (July 3)

Please visit our website org.mie.utoronto.ca/ for upcoming events and to become a member. Follow us on the internet: Facebook, @utorgcafe, Flickr

Carly Henshaw

MEETINGS AND CONFERENCES

CORS Business Meetings

May 28, 2014	CORS Council Meeting, Ottawa, ON
September 19, 2014	CORS Council Meeting, Teleconference
November 28, 2014	CORS Council Meeting, Teleconference
January 24, 2015	CORS Council Meeting, Toronto, ON
March 27, 2015	CORS Council Meeting, Teleconference
April 24, 2015	CORS Financial Planning Committee Meeting
June 13, 2015	CORS Council Meeting, Montreal, QC
June 14, 2015	CORS Council Meeting, Montreal, QC
June 15 or 16, 2015	CORS Annual General Meeting, Montreal, QC

CORS Annual Conferences

June 14–17, 2015	CORS/INFORMS International Conference, Montreal, QC
2016	To be announced
July 17–21, 2017	CORS/IFORS Conference, Quebec City, QC

Other Conferences

2014 Nov. 9–12	INFORMS 2014, San Francisco, CA
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WWW Conference Listings

CORS-SCRO Conference Page: http://www.cors.ca/en/conferences/i_other.php

INFORMS Conference Home Page: <http://www.informs.org/Conf/Conf.html>

IFORS Conferences: <http://www.ifors.org/panorama/conferences/index.shtml>

Netlib Conferences Database: <http://www.netlib.org/confdb/Conferences.html>

SIAM Conference Home Page: <http://www.siam.org/meetings/calendar.php>

POMS Conference Page: <http://www.poms.org/conferences/>

CORS FUNDING OPPORTUNITIES

Graduate Student Conference Support (GSCS) Program

CORS has established the GSCS program to encourage attendance of graduate students at conferences, symposia, or workshops specifically aimed at graduate students, such as student conferences, doctoral colloquia, and conferences for junior operations researchers. CORS may provide partial funding up to \$500 per student for attendance at such events. Note that the GSCS program will *not* fund attendance at CORS meetings, because CORS has a separate program for this purpose. All GSCS funding is subject to availability of funds and the following eligibility criteria:

- Student is a member of CORS.
- Student's supervisor is a member of CORS.
- Student is enrolled in a graduate program in a field related to operational research.
- Student is studying at a Canadian university, or is a Canadian citizen or permanent resident studying abroad.

The application process is competitive. The following criteria will be used to select applications that will be funded:

- The quality of the paper to be presented at the conference, if applicable.
- The benefits that the student is likely to derive from attending the conference.
- The stage that the student has reached in his/her degree program.
- Prior GSCS funding received by the applicant (new applicants will be given preference, all else being equal).

An online application form for GSCS funding is available at
http://www.cors.ca/en/students/i_graduate.php

Since funding is limited, applicants are encouraged to submit their applications in a timely manner. Applications must be received at least two months before the conference date to receive full consideration. Applicants who meet this deadline will be notified of the outcome of their application at least one month before the conference date. For further information, contact:

Mehmet Begen, CORS GSCS Coordinator, E-mail: mbegen@ivey.uwo.ca

CORS Traveling Speakers Program

The Traveling Speakers Program (TSP) enables local sections to bring Canadian OR practitioners / researchers as speakers to their local events. In order to keep costs in line while maximizing the CORS National profile, CORS sponsorship will be limited to 50% of the total expenses, up to a maximum of \$500 per speaker or \$1000 for a single event (conference, workshop). Other expenses can be covered by the local section. The program of the event must acknowledge the contribution of CORS. Each local section must contact the TSP coordinator to obtain approval for funding preferably at least one month in advance of the event date. Payment will be made by the CORS Treasurer upon receipt of the expense report.

Corinne MacDonald, CORS TSP Coordinator, E-mail: corinne.macdonald@dal.ca

THE NEXT ISSUE

The next issue of the Bulletin is scheduled to appear in November. Along with the regular features and news from the local sections, it will contain more information about the next CORS conference. Contributions to this issue, especially news on the activities of SIGs, local sections or CORS Members, should be submitted by **October 10, 2014** to:

Andrea Friars
Editor, CORS-SCRO Bulletin
11 Sawgrass Drive
Oakfield, NS B2T 0G1
Phone: 902-895-8430 ext. 3236
E-mail: andreafruars@gmail.com

The preferred method of submission is by an MS-Word attachment to an e-mail.

CORS BULLETIN TRANSLATION POLICY

Items that are CORS business will be translated into English and French. All other items will be published in the language they are submitted in.

CORS BULLETIN ADVERTISING POLICY

Ads cost \$120 per page, proportional for fractional pages. Logos and prepared layouts can be accommodated. This fee also includes distribution of the advertisement on the CORS ListServ. Direct inquiries to the Editor.

CORS LISTSERV

As a benefit of membership, members may use the CORS ListServ to transmit messages, announcements, and job postings to the entire membership or to a targeted subgroup such as a local section. For example, you can send

- messages regarding the activities and business of the Society;
- announcements about conferences, conference sessions, special journal issues, seminars or other activities provided that these are related to operational research in its broadest sense;
- job postings of general interest to CORS members.

The ListServ is not used for commercial purposes, and all messages are vetted before they are sent out. To submit items to the ListServ, e-mail Erla Anderson, CORS Membership Services at erla@shaw.ca.

For non-members, a fee of \$60 is charged for the distribution of Job Postings and other announcements or messages of interest to the CORS membership.



Canadian Operational Research Society
Société canadienne de recherche opérationnelle

The **Canadian Operational Research Society** was founded in 1958. Its goal is to advance the theory and practice of OR and to stimulate and promote contacts between people interested in the subject.

Publications: A quarterly scientific journal called *INFOR* and a news *Bulletin*.

Meetings: An annual National Conference with award ceremony, occasionally organized jointly with an international society (IFORS, INFORMS), as well as numerous local events organized by the local sections.

Local Sections: CORS has twelve local sections located throughout Canada and three student sections.

Awards and Prizes: CORS presents the following annual Awards and Prizes at its National Conference:

Award of Merit for significant contributions of a present or past member of CORS to the profession of OR.

Harold Larnder Memorial Award to an individual who has achieved international distinction in OR.

Omond Solandt Award to an organization, private or governmental, that is deemed to have made an outstanding contribution to OR in Canada.

Practice Prize for the challenging application of the OR approach to the solution of applied problems.

Service Award for outstanding contributions of time and service to the Society.

Student Paper Competition to recognize the contribution of a paper either directly to the field of OR through the development of methodology or to another field through the application of OR.

Graduate Student Funding: CORS encourages attendance of graduate students at conferences, symposia, or workshops by providing partial funding. Visit CORS website for details.

CORS Diploma: This diploma is awarded to students graduating from a university curriculum comprising several OR courses. Criteria and an example certificate may be found on the CORS website.

Membership Directory: An online Directory of CORS Members is available as a membership benefit.

To join CORS: Go to the CORS website (www.cors.ca) and join online by credit card using the form found under membership services or complete the PDF application form found on the CORS website and mail it with payment to the address below.

Fees: Member \$110; Retired Member \$55; Student Member (including post-doctoral fellows) \$45

Website: <http://www.cors.ca>

CORS-SCRO BOX/C.P. 2225, STN D OTTAWA, ONTARIO K1P 5W4

Atlantic Québec Montréal Kingston Ottawa Toronto Toronto Student Waterloo Student
Southwest Ontario Winnipeg Saskatoon Calgary Edmonton Vancouver

www.cors.ca