CRSSCA - 8ᵗʰ Annual Supply Chain & Logistics Management Workshop, 2023

DALHOUSIE UNIVERSITY

CRSSCA — Centre for Research in Sustainable Supply Chain Analytics

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Sustainable Supply Chains in a VUCA World

Time: 28 November 2023 (Tuesday); 8:30–17:30 Atlantic Standard Time (GMT-4:00)
Location: Rowe Building, Room #3089, 6100 University Ave., B3H 4R2, Halifax, NS, Canada

A flagship event of CRSSCA (Centre for Research in Sustainable Supply Chain Analytics), Faculty of Management, Dalhousie University, and organized by Dr. M. Ali Ülkü, this series of annual Supply Chain and Logistics Management (SC&LM) workshops not only brings in distinguished academics and industry leaders to share their knowledge on the latest trends and cutting-edge research and best practices in SC&LM but also provides an excellent opportunity to cross-pollinate ideas and network with academics, practitioners, and students in a collegial environment while showcasing students' accomplishments in research and industry-partnered experiential learning projects.

Program

Time	Session
8:30-9:00	**Registration and Coffee & Donuts**
9:00-9:10	**Welcome Speech** by **Dr. W. Dominika Wranik**, Assoc. Dean-Research, Professor of Public & International Affairs, Faculty of Management, Dalhousie University
9:10:9:30 **Theme Intro**	**Dr. M. Ali Ülkü**, Professor of Management Science & Information Systems, Director- CRSSCA, Faculty of Management, Dalhousie University *Managing Supply Chains in a VUCA World: A Thematic Introduction*
9:30-10:00 **Talk #1**	**Dr. Nam-Yi Yun**, Postdoctoral Researcher, CRSSCA, Fac. of Management, Dalhousie University *The Impact of Climate Change on Supply Chain Sustainability*
10:00-10:30	**Break - Coffee & Networking**
10:30-11:00 **Talk #2**	**Dr. Selvaprabu Nadarajah**, Assoc. Professor of Operations Management, College of Business Administration, University of Illinois at Chicago, USA *Navigating the Uncertain Path to Net Zero: Balancing Urgency and Social Responsibility*
11:00-12:00 **Keynote**	**Dr. Feryal Erhun**, Professor of Operations & Technology Management, Judge Business School, University of Cambridge, UK *What is Next? : Supply Chain Thinking 2.0*
12:00-13:30	**Lunch & Networking**
12:30-13:30	**2022 SC&LM Best Student Research Competition – Finalists' Presentations** **A:** Comparison of the Physical Internet and the Traditional Distribution System with Carbon Footprint **B:** Returnless Refund in Online Retailing Operations **C:** Making the Lithium-ion Battery Circular Supply Chain Safer: Evaluating Stakeholder Salience for Blockchain Integration **D:** Efficient Relief Aid Distribution to En Route Refugees Under Stochastic Displacements: An Approximate Dynamic Programming Approach **E:** An Operational Perspective on Microfinancing in Developing Countries
13:30-14:00 **Talk #3**	**Dr. Armağan Özbilge**, Asst. Professor of Management Science & Information Systems, Faculty of Management, Dalhousie University, Canada *Who Benefits from Government Tax Subsidies for Corporate Charitable Food Donations?*
14:00-14:30 **Talk #4**	**Dr. Lauren B. Davis**, Professor of Industrial & Systems Engineering, North Carolina A&T State University, USA *Humanitarian Supply Chains: Aspects from Food Bank Operations*
14:30-15:00	**Break – Beverages & Networking**

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15:00-15:20 **Talk #5**	**Irving Shipbuilding Inc. (ISI) Presenters** *Engaging Students in ISI Supply Chain Projects*

15:20-17:00	**Dalhousie SC&LM Major Students Cap-Stone Project Competition**
	A: Diversifying and Growing Canadian Supply Chains for ISI
	    Shakil Bhuiyan, Thomas Castaing, Okyay Kepenek, Kieran Stevenson
	B: Contract Design for 3PL Services for ISI
	    Zachary Biersteker, Yining Deng, Megan Schofield, Léa Talmy
	C: Designing Metrics for Supplier Performance Development for ISI
	    Salome Gierczynski, James MacDonald, Bana Muhtadi, Boya Qian, Daisy Vidovich
	D: Proposing Inventory Management Policies for ISI Shipbuilding Projects
	    Molly Marshall, Carl Radomsky, Andrew Storey, Yutong Tan

17:00-17:30	**Announcement of Awards & Closing Remarks** by **Dr. M. Ali Ülkü**

Keynote Speaker

Feryal Erhun, Ph.D., is the Professor of Operations and Technology Management at Cambridge Judge Business School. She is a co-director of the Centre for Health Leadership & Enterprise (CCHLE) and the Academic Director of the Wo+Men's Leadership Centre. Dr. Erhun's research interests include strategic interactions between stakeholders in supply chains, socially responsible operations, and healthcare operations. She is a strong proponent of practice-based research. Through collaborations with Intel Corporation, Cisco, Stanford University Medical Center, Public Health England, and others, she has combined her academic interests with stakeholders' needs to deliver insights for both communities. Dr. Erhun is an editorial board member of Manufacturing and Service Operations Management and Management Science. She has served as a board member of the Production and Operations Management Society, as the President-elect (2020-2021), and as the President (2021-2022) of the Manufacturing and Service Operations Management Society. She was previously a faculty member in the Management Science and Engineering Department of Stanford University from 2002 until 2013. She holds bachelor's and master's degrees from Bilkent University (Türkiye) and a PhD in industrial administration from the Tepper School of Business, Carnegie Mellon University, USA.

What is Next?: Supply Chain Thinking 2.0.
This talk delves into the core tenets of supply chain thinking, dissecting the challenges and demands that exert pressure on its foundational pillars. We embark on a journey towards sustainable and resilient supply chains, revisiting Professor Hau Lee's seminal triple-A framework of agility, adaptability, and alignment. We expand upon these concepts, imbuing them with a deeper sense of social and environmental consciousness.

Invited Academic Speakers

Lauren B. Davis, Ph.D., is a Professor in the Department of Industrial & Systems Engineering at North Carolina Agricultural and Technical State University. She received her BS in Computational Mathematics from Rochester Institute of Technology, MS in Industrial Engineering from Rensselaer Polytechnic Institute, and Ph.D. in Industrial Engineering from NC State University. Her research focuses on decision-making under uncertainty, primarily using stochastic optimization techniques (Markov Decision Processes, stochastic programming) and simulation. Her work has been applied to solve optimal stocking, transportation scheduling, and distribution decisions in for-profit and non-profit supply chains. She has more than 40 peer-reviewed journal papers and refereed conference proceedings addressing issues related to inventory management, transportation scheduling, port operations, and emergency response in areas such as food supply chains, food security, port operations, and humanitarian relief. Her work has been supported by the National Science Foundation, Department of Homeland Security, and US Department of Agriculture totaling more than $4 million in grant funding. Additionally, her research examining hunger relief supply chains has been featured in CNN's Great Big Story and NSF's Discovery article series. Dr. Davis

is currently the Principal Investigator for an NSF-funded National Research Traineeship grant that explores food security and hunger relief using computational data science.

Humanitarian Supply Chains: Aspects from Food Bank Operations

During the past decade, an increasing number of natural disasters and humanitarian emergencies have prompted significant research in the area of relief chain logistics and supply chain management. Much of the research has focused on challenges associated with the stocking and distributing relief supplies in response to sudden-onset disasters. However, issues surrounding slow onset and persistent disasters (like food insecurity) present a unique set of challenges, particularly with respect to the management and distribution of donated supplies. Based on a partnership with a local non-profit hunger relief organization, we describe the relief supply chain associated with the provision of food aid to populations suffering from hunger. We present predictive and descriptive models that quantify the availability of supply over time, characterize demand, and optimize the distribution of uncertain supply to ensure equity and improve access. Implications of our findings on operational efficiency and service delivery are discussed.

Selvaprabu Nadarajah, Ph.D., is an Associate Professor of Information and Decision Sciences at the University of Illinois Chicago College of Business, the Decision Intelligence and Societal Impact Lead at the Discovery Partners Institute and Visiting Faculty at Argonne National Laboratory. His research addresses challenges at the interface of operations and finance arising in the energy industry using reinforcement learning and optimization. Selva's research has been recognized with the 2021 Commodity and Energy Markets Association (CEMA) Best Paper Award, the 2020 INFORMS ENRE Young Researcher Prize, the Best Overall Paper at the 2020 NeurIPS Workshop on Tackling Climate Change with Machine Learning, and the 2014 William L. Cooper Dissertation Award. Dr. Nadarajah serves on the editorial boards of the Production and Operations Management and Decision Sciences journals. He is the Area Editor of the Energy, Natural Resources, and the Environment (ENRE) department in the Information Systems and Operational Research journal published on behalf of the Canadian Operational Research Society.

Navigating the Uncertain Path to Net Zero: Balancing Urgency and Social Responsibility

Reaching a Net Zero economy involves managing substantial uncertainty around regulatory and market conditions. It also requires a rapid transition that will upend the status quo, ranging from unprecedented capital allocation in sustainable supply chains to the massive integration of renewables into power grids. Past shocks to the economy, such as the Chinese trade shock, have created persistent negative externalities in labor markets, which we should try to avoid. This talk highlights research at the intersection of operations and decision analytics that tackles the challenge of balancing the urgency of achieving Net Zero with the responsibility of reducing negative externalities.

Armağan Özbilge, Ph.D., is an Assistant Professor in the Department of Management Science and Information Sytems at the Faculty of Management, Dalhousie University. His main research focuses on sustainable operations with a particular interest in charitable giving, food waste, hunger, and circular supply chains. His research sheds light on the effectiveness of government legislations in preventing food waste and fostering charitable giving. His work is interdisciplinary and collaborative with local, provincial, and federal charities. He was previously a postdoctoral researcher at the DeGroote School of Business, McMaster University, where he also received his PhD degree. He holds a BSc in Management and a MSc in Quantitative Methods from Hacettepe University, and a MSc in Financial Mathematics from Middle East Technical University (Türkiye).

Who Benefits from Government Tax Subsidies for Corporate Charitable Food Donations?

Leveraging government tax incentives to prompt corporate charitable giving has gained considerable popularity over the last decade. This paper sheds light on the broader consequences of the U.S. government's enhanced tax deduction policy for charitable food donations, which is determined based on the fair market value (FMV) of the

products. We incorporate the enhanced tax deduction into a monopolist food retailer's after-tax profit function. We explore the impact of government tax subsidies on the retailer's decisions, the quality and quantity of donations, and total welfare. Our study reveals that, contrary to conventional wisdom, charitable donations have a non-monotone relationship with both quality and tax subsidy. For example, the retailer may contribute fewer goods even when a larger tax subsidy is available. The enhanced tax-deduction policy may motivate the retailer to intentionally create supply scarcity to increase the FMV of the goods to compound the tax deduction collected. It may achieve simultaneous improvement in donations, consumer surplus, and retail profit only when the retailer donates low-quality goods in a modest quantity. However, high demand uncertainty and/or high-quality donations are likely to reduce both consumer surplus and total welfare, making the retailer the primary beneficiary.

Nam-Yi Yun, Ph.D., is a Postdoctoral Researcher at the Centre for Research in Sustainable Supply Chain Analytics (CRSSCA) within Dalhousie University. She holds a PhD in Disaster Prevention Environmental Engineering Management from Waseda University in Japan, along with an MSc in business administration from Korea University and a BSc in Computer Science and Engineering from Ewha Womans University. Dr. Yun's career includes roles as a researcher at the Institute for Research on Safety & Security of Greater Tokyo, Waseda University, and a Research Associate at Creative Science and Engineering, Waseda University. She also contributed her expertise at Samsung Electronics' R&D center (Telecommunication Network) and conducted projects for the National Emergency Management Agency in South Korea. Her research endeavors encompass disaster mitigation, risk assessment for natural and human-made disasters, resilience, behavior studies during emergencies, leadership, decision making, mentoring relationships, AI, big data analysis (BDA) utilizing text mining techniques, and sustainable development. Her multidisciplinary pursuits address sustainability, supply chain risk management and climate change, I4.0 and humanitarian supply chain, and pressing societal challenges like climate refugees. She participated as a committee member for the Evacuation Research Committee within the Japan Association for Earthquake Engineering (JAEE) and contributes as a reviewer and researcher for journals (i.e., Urbanization, Sustainability and Society; Natural Hazards Review). Dr. Yun's contributions have earned her the Excellent Presentation Award from the Japan Society of Civil Engineers (JSCE) in 2012 and the Carolyn Dexter Best International Paper Award from the Academy of Management (AoM) in 2011.

The Impact of Climate Changes on Supply Chain Sustainability

In today's business world, climate change amplified the Volatility, Uncertainty, Complexity, and Ambiguity (VUCA) in supply chain (SC). Weather unpredictability, frequent disasters, and evolving regulations heighten SC challenges. The convergence of climate changes, globalization, Industry 4.0 technologies, social, and cultural concerns has transformed supply chain risk management (SCRM) into a complex and diverse field. In this context, the adoption of Sustainable SCRM is critical for success. Our strategic approach, "Climate-Change Resilient, Sustainable Supply Chain Risk Management" (CCR-SSCRM), ensures the sustainability by balancing the quadruple bottom line (QBL) pillars of economy, environment, society, and culture. Moreover, Industry 4.0 technologies in Humanitarian SC for disaster response provide practical solutions. Our insights drawn from a literature network analysis provide a comprehensive perspective. (Joint work with M. A. Ülkü.)

Invited Practitioner Speakers

Richard Upton is a Senior Supply Chain Director of the Canadian Surface Combatant Program at Irving Shipbuilding. Richard spent 22 years in Procurement and Supply Chain Management roles at Rolls-Royce plc prior to joining Irving Shipbuilding in 2021. During his time with Rolls-Royce, he served as a Supplier Management Executive, where he was responsible for global supplier management of the external supply chain across the U.S., Europe, and Asia. Previous to that, he held a role as Strategic Purchasing Executive, where he was responsible for the strategic direction and new and future contracts for the external supply chain. Preceding his time as an Executive, Richard spent two years as the Head of Equipment Procurement in Indianapolis, USA.

Richard's background includes over five years with Rolls-Royce Aero Engine Controls, where he served as a director of strategy/procurement. Richard graduated from Staffordshire University with a first-class BA(Hons) degree in Business Studies and is a Member of the Chartered Institute for Purchasing and Supply (CIPS). Originally from the U.K.— Richard now lives in Halifax, Canada, with his wife, Hannah, and two children.

Kaitlyn Veitch is a proud graduate of the Rowe School of Business. Since graduating from the Commerce Co-op Program in 2013, Kaitlyn has spent the last ten years in Supply Chain. She brings diverse experience from the marine, forestry, and transportation industries. Currently, Kaitlyn holds the position of Supply Chain Strategy Manager for the Canadian Surface Combatant Project. The team is working on the most modern and complex shipbuilding program in Canada's history. Irving Shipbuilding's supply chain team has generated $9.8 billion in increased GDP, and her favourite aspect of the job is seeing the Canadian industry grow. Kaitlyn has much pride in revitalizing the Canadian Shipbuilding industry right here in Halifax. Kaitlyn has an MBA from the Ivey School of Business and sits on the executive board of the Affordable Housing Association of Nova Scotia.

Linda Şener is a recent graduate from Dalhousie University with a Bachelor of Commerce Degree on the Dean's List, and a major in Supply Chain and Logistics Management. After taking Dr. Ülkü's Logistics and Supply Chain Management course as an elective, Linda decided to pursue a career in supply chain management. She feels very grateful that the cooperative (co-op) program allowed her to experience different areas in business, as she worked at Nova Scotia Power as a Business Analyst in the Finance department, at a start-up robotics company as a Marketing Specialist, and at PepsiCo where she completed an 8-month internship as a Production Supervisor in Moncton. Linda is very excited to apply all her knowledge and skills gained from her education and co-op experiences to her new position at Irving Shipbuilding as an Associate Supply Chain Specialist, where she works closely with Kaitlyn Veitch and the Supply Chain team on the Canadian Surface Combatant Project.

Workshop Organizer and Chair

M. Ali Ülkü, Ph.D., P.Eng., is a Full Professor and the (Founding) Director of the Centre for Research in Sustainable Supply Chain Analytics (CRSSCA) at the Faculty of Management, Dalhousie University, Canada. Dr. Ülkü's research includes studies in circular and sustainable supply chain and (humanitarian) logistics systems, analysis of manufacturing/retailing and service operations, green marketing and optimal contract designs, analytical modeling of sustainable consumption and development, and interdisciplinary research on big data and societal/environmental problems. His research papers have appeared in such leading scholarly journals as the *European Journal of Operational Research*, *Int. Journal of Production Economics, Journal of Business Research, Journal of Cleaner Production*, *Journal of Retailing and Consumer Services*, and *Service Science*. His research programs have received funding from various agencies, including the National Science Foundation (USA), the National Sciences and Engineering Research Council of Canada, and the Scientific and Technological Research Council of Türkiye. In 2022, for a five-year-long research project on logistics emissions modeling, Dr.Ülkü and his co-applicants were awarded $3.62 million by the Climate Action and Awareness Fund, Government of Canada. The recipient of a *2023 Global Triple E Award (Education Champion)*, *Research Star Award* (2021, Dalhousie)*, the Distinguished Professor Award* (2019, IEOM Society), and the *Exceptional Teaching Award* (2007, University of Waterloo), Dr. Ülkü has designed from scratch and taught numerous courses on Supply Chain Management, Logistics, Operations Management, Transportation, Optimization, and Business Analytics in Canada, Türkiye, and the USA. Among others, he serves as an Associate Editor for the journal *INFOR: Information Systems and Operational Research*. He is also a cross-appointed professor with the Department of Industrial Engineering and the School for Resources and Environmental Studies and an adjunct professor of Management Sciences at the Faculty of Engineering at the University of Waterloo. He co-edited a book entitled *Big Data Analytics in Supply Chain Management: Theory and Applications,* published in 2021 by CRC Press - Taylor & Francis.

About CRSSCA (www.dal.ca/crssca)

The Centre for Research in Sustainable Supply Chain Analytics (CRSSCA) is the world's first and only research centre dedicated to sustainable supply chain analytics research. The mission of the Centre for Research in Sustainable Supply Chain Analytics (CRSSCA) is to provide big data-driven, innovative, and analytical solutions to and to disseminate scholarly knowledge in the understanding of complex modern global supply chain problems through the lens of sustainability (economic, environmental, social and cultural). Housed in the Rowe School of Business, Dalhousie University, CRSSCA is the supply chain research hub in Eastern Canada. CRSSCA fosters interdisciplinary research that sheds light on complex issues in supply chain management. Keeping sustainability imperatives front and centre, CRSSCA creates new knowledge in prescribing solution models for data-driven industrial problems, devises analytical tools for better decision-making, and develops insights into the intricate relationships between supply chain operations, green logistics (global trade, inventory, process, and product design, procurement, manufacturing, transportation) and sustainable consumption.

A frontier research hub in Eastern Canada, CRSSCA enables faculty-student-industry research collaborations, brings in research funding, produces cutting-edge research, sponsors annual workshops and case competitions, and provides unique opportunities for students and executives to enhance their academic and professional skills while enabling research experience for the unique SC&LM Major in the Bachelor of Commerce program at Dalhousie University.

With its activities, CRSSCA contributes to UN Sustainable Development Goals (SDGs) #9, 11, 12, 13, and 17.