

# Ottawa Chapter Newsletter

<https://www.sreottawa.com>

September 2023



## SRE OTTAWA CHAPTER

| <u>EXECUTIVE</u>    |                |              |
|---------------------|----------------|--------------|
| President (interim) | Ahmed Bashir   | 613-601-4697 |
| V/President         | vacant         | 613 371-3278 |
| Treasurer           | James Menard   | 613-596-7343 |
| Secretary           | Malcolm Nash   |              |
| <u>CHAIRS</u>       |                |              |
| Technical Program   | vacant         |              |
| Education           | vacant         |              |
| Membership          | Jim Arsenaault | 613 836-4003 |
| Newsletter          | James Menard   | 613 371-3278 |
| Int'l Liaison       | vacant         |              |
| Publicity           | vacant         |              |

## POINT OF VIEW

Welcome everyone to the start of the 2023-2024 season! I trust you all had a great summer and some of you had a good vacation. This fall we have lined up 3 speakers for presentations. Since February of this year, we have been conducting in-person as well as virtual meetings simultaneously with great success in the Edge Room at General Dynamics. The links to the meetings are sent out with the notices 2 weeks and 1 week before the presentations and we used the Zoom application. We look forward to meeting our members face-to-face again to enjoy some hospitality courtesy of the Chapter. Details of the presentations for this fall are provided below.

We are looking for speakers for the winter/spring sessions in February, March and April 2024 so please step forward or recommend a friend and come and join your fellow members and colleagues for a chance to win our famous Colin Chabot Award. Every speaker receives a colourful presentation certificate signed by the President.

As mentioned in the February 2023 newsletter elections were to be held at our AGM at the April meeting. However there were no candidates for the position of President so the election was not held. Therefore, in accordance with the SRE by-

laws I as Vice President became the Interim President. That is my official role as of then and that is how our past President, Jeremy Bruce, introduced me to the SRE international executives. This means that we are still looking for someone to be our President so if you are so inclined, please come forward and submit your name to any of the Executives listed above. As soon as the position is filled, I will revert to my role as Vice-President.

I'd like to take this opportunity to thank Jeremy for his excellent leadership and being an inspiration to all members. I would also like to thank Arun Gowtham who was our Education Chair, and did an excellent job over the past 2 years and started a blog section on our website, where you will find several of his commentaries on our presentations. Arun stepped aside in April 2023 to spend time growing his new company. Also moving on is Pauline Mulles, who as our Program Chair for the past two years cheerfully rounded up speakers for our technical program. I wish them all every success in their future endeavours.

Hope to meet you soon - Ahmed Bashir

## FALL 2023 OTTAWA SRE TECHNICAL PROGRAM

Mark your calendar! Here are the dates for presentations this Fall. Confirmation of later speakers is pending:

**September 27th** - Dr. Julio Pulido, *Reliability of Thermoelectric Devices*;

**October 25th** - Brian Baker, *Regulations, assumptions, rules of thumb, references and what they mean to reliability*;

**November 29th** - Kelly Daize, *AreaX.O - Safe & Smart Infrastructure that Protects Vulnerable Road Users*.

All presentations for the Fall 2023 season will be held in the Edge Room at General Dynamics Canada, 1941 Robertson Rd in Bells Corners.

Presentations can be viewed remotely using the link provided in the monthly presentation announcements sent by e-mail two weeks and one week prior to the meeting.

7:00 p.m.        Networking

7:15 p.m.        Presentation

8:00 - 9:00    Questions and Discussion

## **CHAPTER NEWS**

- Our April Annual General Meeting, held in person with refreshments, saw the departure of Jeremy Bruce as President, with Vice President Ahmed Bashir stepping in as Interim President. Also stepping down from Technical Program is Pauline Mulles, and from Education, Arun Gowtham. Thank you all!
- There are now several vacant positions, as shown on the masthead. Please consider joining your chapter's executive.
- Congratulations to Arun Gowtham, winner of the Colin Chabot Memorial Award this year for his presentation Predictive Maintenance (PdM) using Machine Learning (ML)!
- Our branch has been awarded a grant of \$1,000 USD from the SRE to use towards a reliability-related event! We are in the early stages of planning for a one day workshop on the theme of how AI augments all aspects of Reliability Engineering - from Design to Manufacturing to Operations to Maintenance.
- The SRE Ottawa executive has been in contact recently with the Institute of Electrical and Electronic Engineers (IEEE), concerning possible synergies with the IEEE Reliability Society (RS) - Ottawa. As the IEEE was having a Divisional Conference in Ottawa we were able to meet with Dr. Steven Li the current IEEE RS President. We concluded that when the IEEE identifies an RS Ottawa representative we can engage then in developing interactions that can benefit both organizations. An integrated speaker presentation program would be a good item for any discussions.
- Ray Lee has recently written "Design for Reliability (DfR) - A lifecycle Management View". This is an extensive 164pp document consisting of 8 Sections; Introduction, DfR Lifecycle Mandates, Design Assurance, Design Proving and Verification, Reliability Qualification, New Product Introduction, Manufacturing and Volume Production, Product Obsolescence. The document is particularly valuable for its reliability history and extensive reference list. For a

person just getting into the reliability field this work by Ray is a good place to start and old hands can brush up on the new stuff. We are in the process of making it available to members.

- Don't forget about **RAMS!** Mark your calendar for January 22-25, 2024 in Albuquerque.

## **RELIABILITY IN THE NEWS**

The continuing saga of Ottawa's Light Rail Transit system saw a month long shut down while efforts to determine and actually fix the root causes of wheel/bearing assembly breakdowns continue. According to this [CBC News report](#) unintended contact between the wheels and an inner restraining rail on curves puts excessive pressure on the bearings causing premature wear. The proposed solution includes redesign of the bearing assembly and removal or repositioning of the restraining rails. Stay tuned.

## **RELIABILITY CHALLENGES WITH AI**

The term 'reliability' crops up a lot when discussing Artificial Intelligence (AI), notably *generative natural language processors* such as ChatGPT that have been trained on vast amounts of information gleaned from the internet, including websites, books, news articles, and more. Here is a [primer on issues associated with ChatGPT](#). In this context reliability refers to the quality of being trustworthy or of performing consistently well, which in general, it does not.

But should you worry about AI being used to replace you in your job? Yes, ChatGPT is going to create disruption in some industries—particularly in marketing and customer relations. Should reliability engineers be concerned for their jobs? [ReliabilityWeb.com](#) thinks not. It is more of an opportunity to adapt and pivot.

The application of AI In industrial settings relies on the simulation of human intelligence processes by machines, especially computer systems, according to [this guide](#). These processes include: Learning – the acquisition of information and rules for using the information; Reasoning – using the rules to reach approximate or definite conclusions; Self-correction – automatically making adjustments to improve performance.

The Basics: The term AI now includes things like natural language recognition, but there are other techniques. Rule-based expert systems built in the

past for industrial applications such as machinery health monitoring, are the simplest form of AI. People have been using computers for decades to monitor and control machines. A program running on a computer, when given some inputs, provides an output. The programming technique used in this case is called *explicit programming*. It is explicit because a set of instructions is written (i.e., a program) that repeatedly solves the problem according to those instructions (i.e., logic). Two points to note about this type of computing:

- It is given a set of instructions by a human on how to solve the problem.
- It will not learn or get any better with experience.

Machine Learning (ML) differs from explicit programming in two ways:

- ML creates the program. This is referred to as an algorithm, a model and, sometimes, an agent learning from the data it is given.
- Its ability to solve the problem gets better with experience. In other words, ML learns.

However, AI can only learn from the data that we expose it to: 'garbage in, garbage out'. Engineers choose the dataset used in modelling based on their experience, but here trust is essential. This article describes an [approach for ensuring trust in AI](#) by addressing key aspects of explainability, competence, operational transparency, predictability and ethics.

### **TINY SPACE ACADEMY?**

Are you aware of the [Small Spacecraft Community of Practice](#) at NASA that offers free on-line seminars, design tools, and publications such as the Small Spacecraft State of the Art? Thanks to Paul Dobrovolny for the link.

### **SREO Newsletter**

If you have something to share with the Ottawa -SRE community, please send it to: James Menard [menardsj@sympatico.ca](mailto:menardsj@sympatico.ca). Deadline for the next Newsletter is Dec 31, 2023